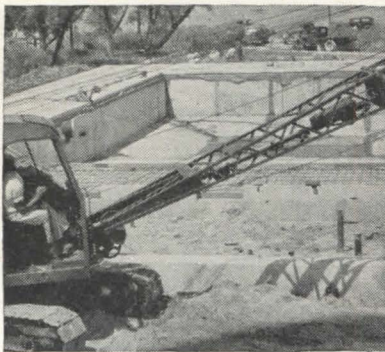
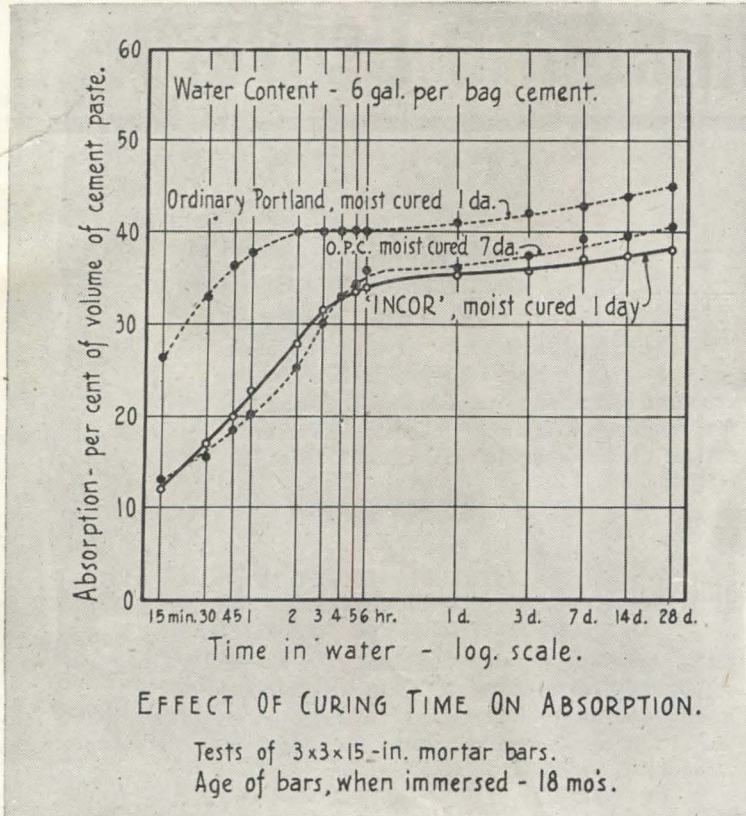


'INCOR' HELPS KEEP WATER

In or Out



Faster, thorough 'Incor' curing makes it easier to get watertight work. Left, Municipal Swimming Pool, Moss Point, Miss. 'Incor' concrete keeps water IN.

Right, heavy-duty floor at Dr. Pepper Bottling Works, Springfield, Mo. 'Incor' keeps water OUT—longer wear, better service.



GOOD concrete—a good mix, properly placed and THOROUGHLY CURED—is watertight, of itself and by itself. But thorough curing means keeping ordinary concrete wet 6 to 8 days—next to impossible on most jobs. That is why it pays to use 'Incor' 24-Hour Cement. 'Incor' cures, that is, combines with water, so much faster that you get THOROUGH curing in 24 to 48 hours, saving 5 to 7 days on each pour. Tests summarized in graph, above, show that 'Incor' cured 1 day has less absorption than ordinary cement cured 7 days.

Specify 'Incor'* wherever water has to be kept in or out—see the all-important difference in durability and watertightness. Illustrated book, "Watertight Concrete," on request to Lone Star Cement Corporation, 342 Madison Ave., New York 17, N. Y.

*Reg. U. S. Pat. Off.



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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25,300,000 BARRELS ANNUAL CAPACITY

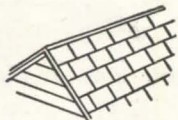
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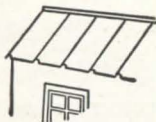
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A sensational and original development of Reynolds engineering! Each clapboard sets firmly into the locking flange of the clapboard beneath, so that all nailing is completely covered! .032 gauge, 8 and 12-foot lengths, exposed clapboard surface 8". Special Starter Strip, Butt Joints and Corner Finishing Caps. Makes a beautiful Colonial sidewall when painted—or may be left unpainted. Either way, the inside aluminum surface provides efficient insulation.



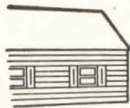
REYNOLDS LIFETIME ALUMINUM SHINGLES

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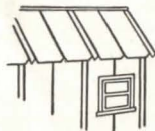
REYNOLDS LIFETIME ALUMINUM WEATHERBOARD SIDING

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Aluminum requires no protective surface coating. However, it may be painted for decorative purposes, as in this house constructed with Reynolds Lifetime Aluminum Building Products.

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THE building industry had a right to expect that out of wartime experience would come new, better, *permanent* building products in time to meet America's critical shortage. Reynolds answers that call with a great new line of aluminum building products... soundly engineered... already being delivered in tremendous quantities... already going up in America's most modern homes!

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Distribution is through established building trade channels. Contact your supply source for full information.

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YOU KNOW IT'S NOT
ALUMINUM



REYNOLDS METALS COMPANY
BUILDING PRODUCTS DIVISION
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There's a double reason for using the most dependable materials in the boiler room of a hospital . . . to protect the investment, and to protect the patients, whose health and welfare might be affected by any failure of the heating or the utilities.

This fact was recognized in selecting piping materials for the boiler house at the Veterans Administration Hospital, Chillicothe, Ohio. The feed water lines between feed water heater and suction pumps and between tank and

heater; the boiler feed piping; the blow-off lines; the returns; the vents; and the cold water lines, were specified "wrought iron." Byers Wrought Iron Pipe was installed; some of the services are shown in the illustration.

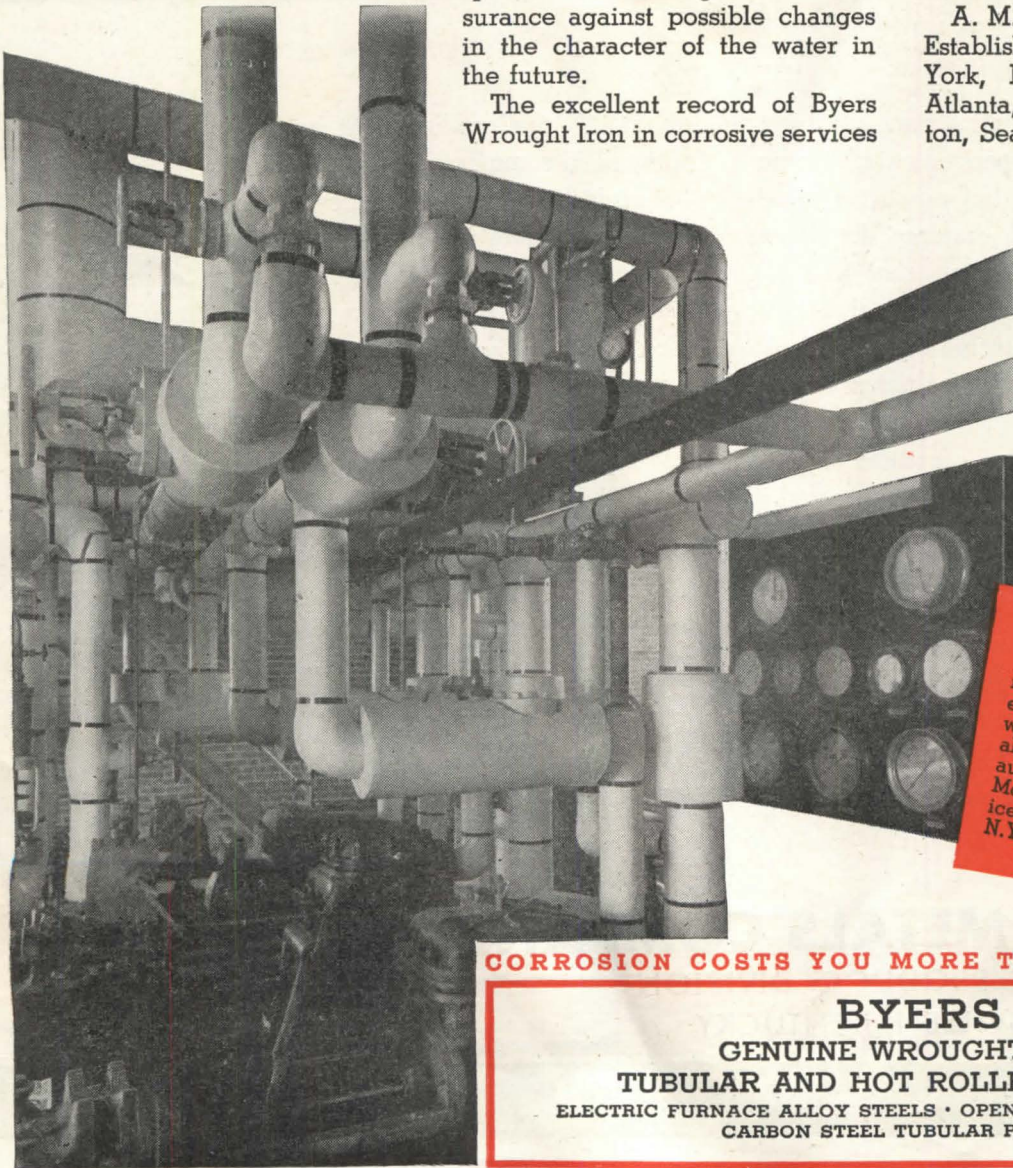
Corrosion can always be anticipated in these applications; the only question is the degree of severity. Byers Wrought Iron has been used in all these services, and its superior corrosion-resistance is a matter of engineering record. Even when current corrosive conditions are not severe, far-sighted specifiers use wrought iron as insurance against possible changes in the character of the water in the future.

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cuts weight to a third or fourth of ordinary concrete. NHA points to the possibility of bringing roadbuilders — since the road program is being curtailed — into concrete house construction.

More Prefabs Insured

The Federal Housing Authority reports that many more manufacturers of factory-built houses have been seeking FHA mortgage insurance since the veterans' program began. Before approving a product, FHA sends engineers to the factory to inspect it and to observe assembly methods. Before a ruling is issued the manufacturer must build one demonstration house without FHA insurance.

NHA reported in September that 11 factory-built home manufacturers had applied for market guarantees.

Other developments in the veterans' program include extension of priority assistance to trailer manufacturers to speed up moderately-priced models for former servicemen; requirement for 60 rather than 30 days as the time to hold houses built under the program for sale to veterans; assignment of U. S. Public Health engineers to aid NHA as consultants on health and environmental sanitation; and arrangements for seeking draft deferments for skilled construction workers.

More Ceilings Lifted

Building materials, along with other items, came in for price ceiling boosts as OPA got back into operation during late summer and early fall. Boosts went to hardwood flooring, stock millwork, pine stock millwork, Douglas fir doors, stock screen goods, warm air furnaces, and standard wire nails.

Reseller mark-ups — reflecting increases of 1-3 per cent — went into effect for a list of items, including, among others, asphalt and tarred roofing products, vitrified clay sewer pipe, Portland cement in southern California, asbestos cement roofing and siding shingles, metal lath, New Jersey clay building brick, and clay drain tile in Ohio and Michigan.

Lumber Output Pushed

As lumber production elbowed toward record heights, federal agencies pulled additional strings to stimulate it. The Housing Expediter, under the premium payments regulation, made an agreement with the State of Washington whereby timber for sale on state-owned land will be upped from an estimated 1½ billion board feet to three billion during the next year or more. Uncle Sam will compensate the state for extra "timber cruiser teams." A bi-monthly

sale in October was expected to make more timber available to builders and subsequent sales are expected to show increased momentum.

Funds totaling \$1,234,000 were allocated to Interior Secretary Krug to build more than 200 miles of access roads to timber lands on Indian reservations with a view to boosting production by 17,000,000 board feet this year and 15,000,000 in 1947. The Forest Service speeded its access road program, which is expected to up timber output by nearly one billion board feet next year and by more than a billion in 1948.

The Department of Commerce warns again that 1946 and 1947 are critical to the lumber industry. "If users of lumber can be substantially satisfied quantitatively, qualitatively, and economically during these two years, and at least token export markets can be maintained," it says, "the future stability of the industry should be assured for many years. Excessive prices, inadequate supplies or inferior quality, or failure or inability to protect its distribution system will encourage substitute materials and may cause permanent injury to the lumber industry."

Housing Costs Watched

In carrying out a policy to keep veterans' housing costs down, Raymond M. Foley, FHA Commissioner, advises that FHA field offices are instructed "to apply only costs found existent for the most efficient builders, rather than for the typical or median builder. They are required to break down lump-sum figures and sub-contract bids into material costs and labor costs calculated on current hourly wages and normal employment practices, plus the normal profit write-up. This scrutiny is designed to uncover unnecessary charges which the general contractor is being required to pay under present conditions, as well as unnecessary items which may exist in his own estimates."

Mr. Foley says home owners are financing property repairs and improvements under FHA at an accelerated rate this year. More than 311,500 loans were reported in the first six months compared to 115,200 in the first half of 1945. The monthly total exceeded 85,000 in June.

Construction Mounts

The Bureau of Labor Statistics comes up with interesting facts on building. To cite a few:

1. Expenditures for new private construction in the first half of 1946 reached the highest half-year mark for more than a decade — \$3½ billion. This was 3½ times as large as in 1945 and 50 per cent greater than in 1940.
2. In June, for the first month since the 1942 war peak, construction expendi-

(Continued on page 13)



General perspective of prize-winning design for proposed legislative palace, Ecuador

PRIZEWINNERS

First prize of 50,000 sucres (approximately \$3,500) in the international competition for the design of a new Legislative Palace, or national capitol, for the Republic of Ecuador has been awarded to two cousins, Robert DuBose Burbank and Charles DuBose of New York. With the award goes the right to execute the working drawings and supervise construction on behalf of the government of Ecuador.

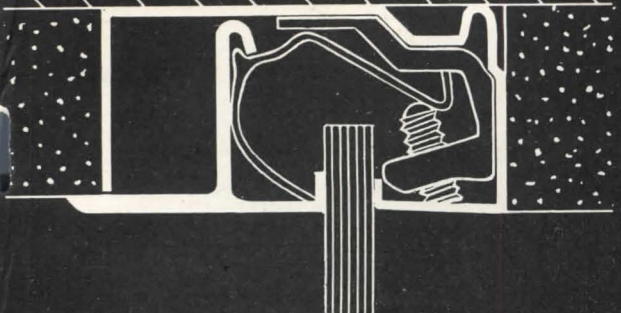
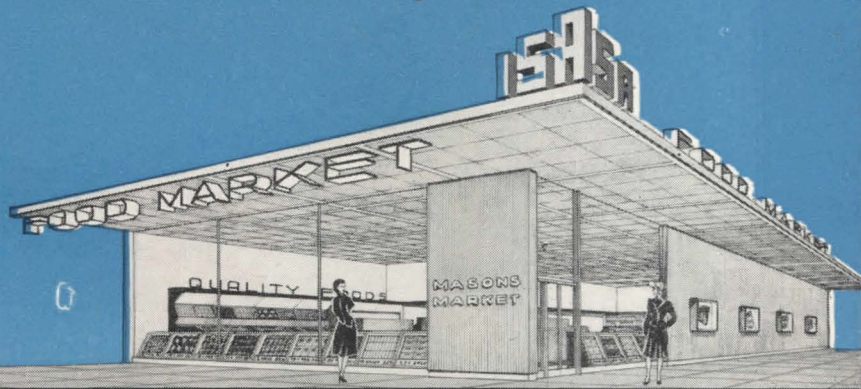
The winning plans call for a dignified,

modern palace to be built of andesite, a stone native to Ecuador. Nine stories high and some 300 ft. in length, the building will stand on a hill overlooking the capital city of Quito. To cost about 15,000,000 sucres, it will contain respective chambers for the Senate, Representatives and Plenary Congress, a library, hall of archives, committee chambers, etc.

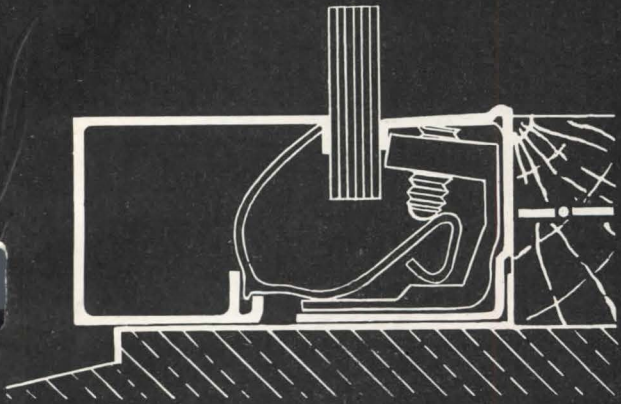
Winner of the second prize of 30,000 sucres was Carlos Gomez Gavazzo, of Montevideo, Uruguay.

new

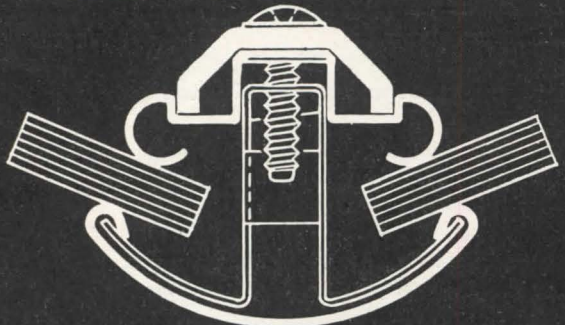
Features in Construction



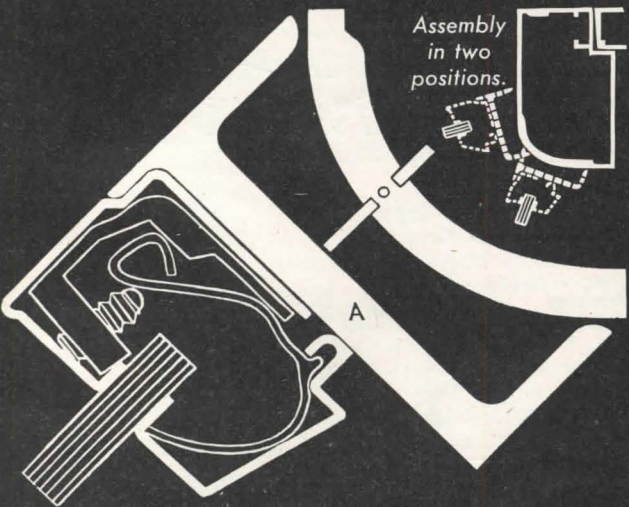
Flush glazing is achieved in this assembly which eliminates projecting metals and makes glass "disappear" into walls and ceilings.



To insure strain-free settings, glazing mouldings have stainless steel spring lugs which maintain a resilient grip along the entire length of glass.



K-47 corner bars are self-adjusting and will receive glass at any angle within a range of 70 degrees without altering the bars.



Assembly in two positions.

This K-47 door post receives glass at any angle between 90 and 180 degrees, because the connecting member (A) can be fastened to the post's rounded corner at any point.

The trend in contemporary store front design has made new structural demands on glazing mouldings, metal trim, and entrances. The K-47 Line has been engineered to meet these demands.

Pictured at the left are a few of the new features in construction of the K-47 Line. These features—and many others—enable you to create outstanding architectural effects through the free use of floor-to-ceiling lights of glass, full-vision doors, flush glazing and many other elements of modern design.

And a number of K-47 assemblies, such as the corner bar and door post pictured at the left, have been simplified to obtain a more clean-lined appearance and to make installation easier.

For construction details of the K-47 Line and the Kawneer Standard Line, fill out and mail the coupon below.

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THE RECORD REPORTS

(Continued from page 13)

War Relocation Authority, succeeds Mr. Krooth at FPHA. Allen Coe follows Gordon Rieley as Director of OPA's Building and Construction Division.

Wages Codified

Following the revival of OPA, the Wage Adjustment Board issued new codified regulations to govern wage payments in building construction. Included in the rules was one allowing a contractor, without advance approval, to increase his wage rates to any higher rates already sanctioned by the Board for the area in which the contractor operates.

With A.F. of L. and C.I.O. advisory councils on housing work in action, NHA announced that work stoppages affecting the housing program hit a low point in July.



MATERIALS ROUNDUP

Production of most key construction materials registered substantial increases in the first half of this year, compared with the first six months of 1945, the Construction Division, Department of Commerce, reports. Some of the highlights of the report are:

Steel. The high rate of increase in steel output evident in recent months is expected to taper off because of continued shortages of pig iron and scrap. Producers are far behind on commitments. Issuance of priorities for steel for building materials will be continued into the fourth quarter.

Lumber and Lumber Products. Total output of lumber is expected to pass the 32-billion-foot goal set for 1946, but supplies of several important lumber products—particularly millwork, hardwood flooring and softwood plywood—continue inadequate to meet requirements.

Clay Products. Although output of clay products increased substantially during the first half of 1946, supplies will continue tight in spots owing to heavy order backlogs and increasing demand.

Cement. Output for the first half of the year—69,600,000 barrels—showed a gain of 64 per cent over that for the corresponding period of 1945, and of 14 per cent over that for the last six months of 1945. June shipments exceeded production by less than 1 per cent. This was the first month in 1946 in which stocks were not heavily depleted.

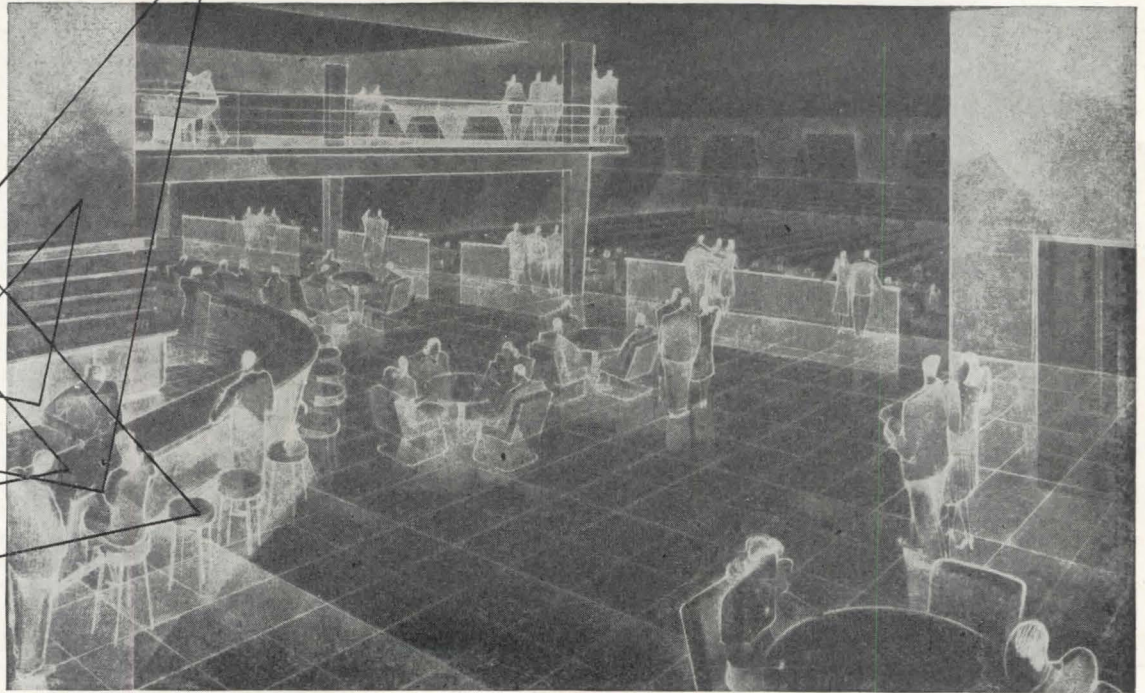
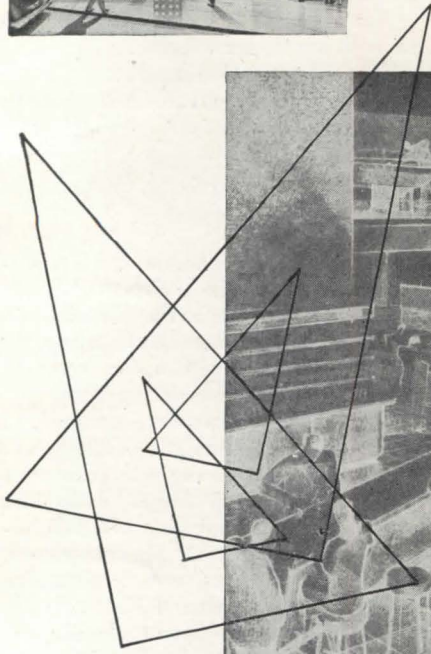
Gypsum Board and Lath. Average current output is about equal to new orders.

Cast Iron Soil Pipe. Unfilled orders equal about 12 months production at the

(Continued on page 16)



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Photograph by Fabian Bachrach

Edgar Lynch, Architect, directs activities of the new Brunswick Architectural Research Department. In practice since 1929, he interrupted a noteworthy career as architect and consultant to outstanding Chicago and New York business and realty firms, to collaborate with Donald Deskey Associates on the original concept of this Brunswick service.



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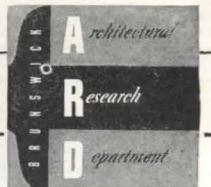
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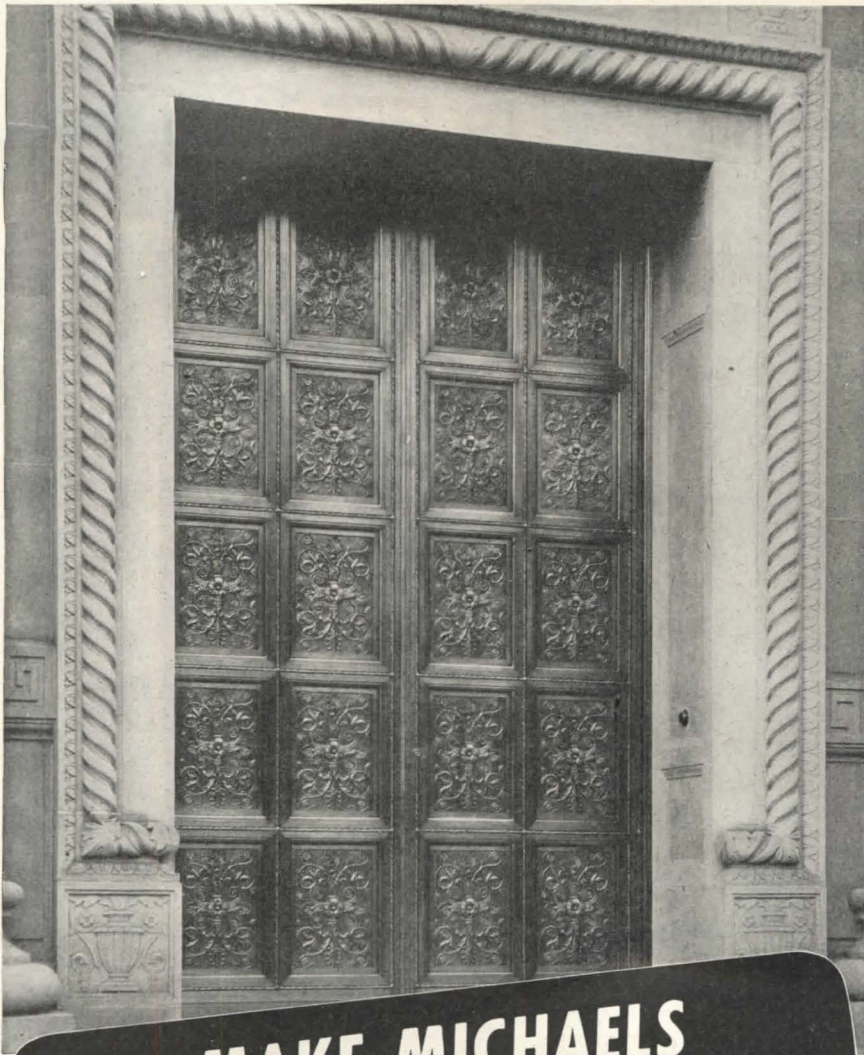
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THE RECORD REPORTS

(Continued from page 14)

estimated June rate.

Concrete Building Block. Output continues inadequate to meet demand.

Nails. Third-quarter output expected to be at a near-normal rate.

Plumbing and Heating. Production of plumbing fixtures remains inadequate to fill requirements.

BUILDING NOTES

Veterans' Villages

Plans have been announced by McCloskey Homes, Inc., for two small-house developments in the Philadelphia area, the first in a series of large-scale home building projects for veterans planned by the company.

The first of the two developments, to be known as Whitemarsh Village, will occupy a 265-acre tract in the Chestnut Hill area just outside Philadelphia. Plans call for the erection of 1,000 all-masonry homes of six and seven rooms, each on its own quarter-acre plot. The price range will be from \$8,800 to \$9,800.

The other development already announced is Academy Gardens in north-east Philadelphia. To cover a 223-acre site, it will provide 1,500 all-masonry homes expected to sell at from \$7,500 to \$8,500. All houses in both groups are for sale to veterans only.

VA Hospitals

Army Engineers have let architect-engineer contracts for three more Veterans Administration hospitals, located at Wilmington, Del., Omaha, Neb., and Fresno, Calif.

Massena and DuPont of Wilmington have the contract for the hospital at Wilmington, a 300-bed general medical and surgical institution estimated to cost \$4,950,000. The Omaha contract was let to Ellerbe and Co. of St. Paul, Minn., and the Leo A. Daly Co. of Omaha. This is a 500-bed general medical and surgical hospital with an original estimated cost of \$6,825,000. The Fresno contract was awarded to Masten, Hurd, Huber and Knapik of San Francisco, for a 250-bed general medical and surgical hospital, the original cost of which is estimated at \$4,445,000.

P.I. CONSTRUCTION

The U. S. Engineers have awarded a large C.P.F.F. contract for all their construction in the Philippine Islands to Johnson, Drake and Piper, Inc., of Minneapolis, Minn., New York City and Oakland, Calif.; the Utah Construction Company of Ogden and Salt Lake City, Utah, and San Francisco, Calif.; and Grove, Shepherd, Wilson and Kruge,

(Continued on page 18)



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THE RECORD REPORTS

(Continued from page 16)

Inc., of New York City, Washington, D. C., and St. Louis, Mo. The three firms, which have had wide experience on Army and Navy construction both in the United States and abroad, will operate jointly as Drake-Utah-Grove. Headquarters have been established at Sausalito, Calif., and in the Marsman Building, Manila.

ARCHITECTS ORGANIZE

Meeting in Cheyenne in June, the qualified architects in Wyoming organized the Wyoming Society of Architects. The following officers were elected: president, Fredric Hutchinson Porter, A.I.A., of Cheyenne; vice president, Leon C. Goodrich, A.I.A., of Casper; secretary, G. C. Hollo, A.I.A., of Cheyenne; treasurer, C. W. Shaver, Jr., of Sheridan. R. Walter Bradley, Cheyenne, Armand Kellogg, Rock Springs, and F. I. Byerly, Thermopolis, were elected to the board of directors. The current membership of the group is 17.

AT THE COLLEGES

New School

The first school of architecture in seven states in the Colorado and Rocky Mountain region was established at the Civic Center campus of the University of Denver with the opening of the fall quarter. Director is Carl Feiss, formerly director of the planning commission of the City of Denver, and now planning director of the department of development at the University of Denver. The new school is offering five-year degree programs in architecture and planning in the College of Arts and Sciences.

Expanded Program

Cooperating for a second year with the Los Angeles chapter of the A.I.A., University of California Extension this fall is launching an expanded program of engineering and architectural courses, a majority of which will be designed as refresher work for professional men and women.

The courses offered will include engineering drawing, materials of engineering construction, analytical mechanics, building codes, construction supervision, and landscape architecture. For the full schedule, address University of California Extension, Los Angeles 24.

Heating Research

Soon to begin at the University of Illinois, in cooperation with Bituminous Coal Research, Inc., representing the soft coal industry, is a three-year study of planning and design of homes to be

(Continued on page 20)



Sacred Heart Cathedral, Raleigh, N. C.

Concrete craftsmen choose White Cement

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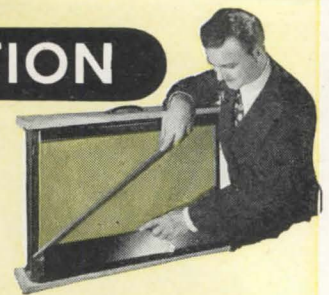
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THE RECORD REPORTS

(Continued from page 18)

heated by coal. The project will consider such subjects as coal storage and handling, ash handling, furnace location and the arrangement of heating facilities for most convenient use of coal. It will involve study of equipment and house plans, and development of suggestions for builders and home owners. The University's Department of Architecture will be in charge of the project and will appoint a research professor to conduct the investigation. Findings will be published by the Small Homes Council at the University, which arranged the project.

New Bulletins

Four new technical bulletins have been issued by the Engineering Experiment Station of the University of Illinois:

1. *Investigation of the Strength of Riveted Joints in Copper Sheets* (No. 360), by W. M. Wilson and A. M. Ozelsel. Results of a series of tests planned to determine the strength of riveted joints against failure, the relation between the load and the slip of the rivets and between the load and the separation of the sheets at the edge of the joint, and the shearing strength of undriven rivets of all diameters.

2. *Residual Stresses in Welded Structures* (No. 361), by Wilbur M. Wilson and Chao-Chien Hao. Includes an analysis of various theories of residual stress, and complete reports on tests to determine the behavior of welded seams under loads, tests to determine the behavior under static loads of plates with circular welded seams, and fatigue tests of plates with longitudinal butt welds.

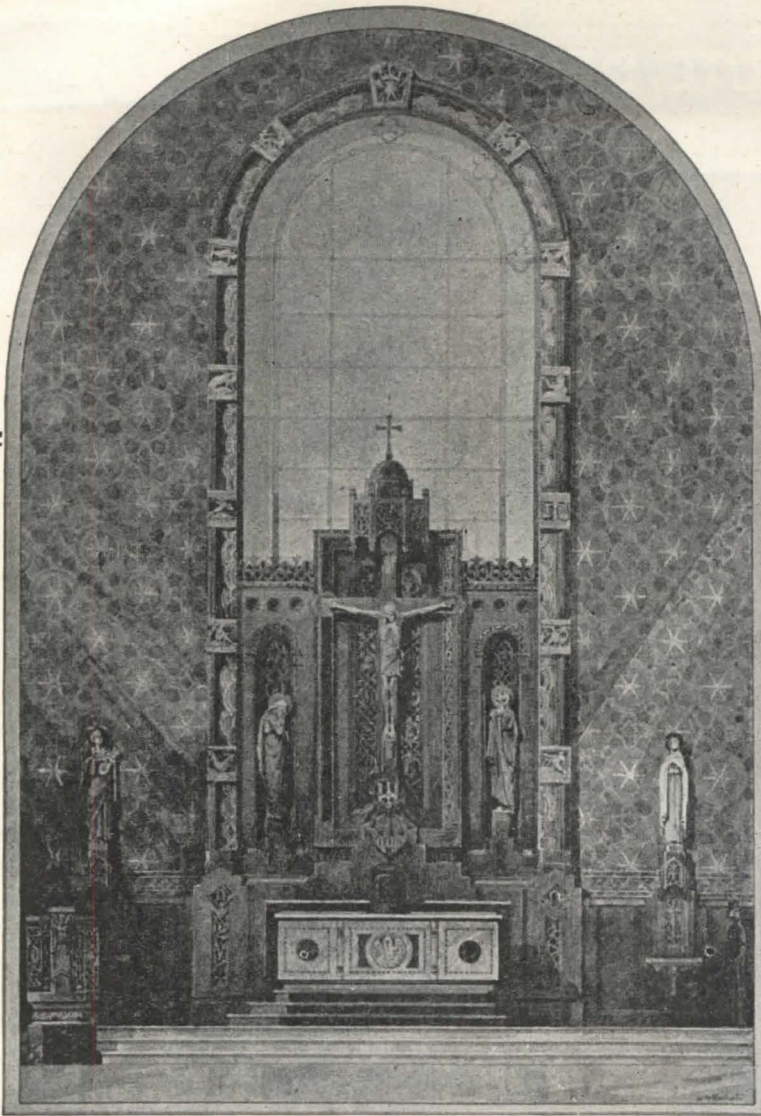
3. *The Bonding Action of Clays — Part II, Clays in Dry Molding Sands* (No. 362), by Ralph E. Grim and F. Leicester Cuthbert. Includes data showing the relation of dry compression strength to amount of tempering water for various amounts of each type of clay; presents a theory of dry strength based on the wedge-block concept of holding grains in place.

4. *Studies of Slab and Beam Highway Bridges — Part I, Tests of Simple-Span Right I-Beam Bridges* (No. 363), by Nathan M. Newmark, Chester P. Siess, and Robert R. Penman. A report on tests made on 15 I-beam bridges.

For copies of the four new bulletins, address the Engineering Experiment Station, University of Illinois, Urbana.

Building Started

Construction of the University of Chicago's new \$920,000 administration building, the first step in the University's
(Continued on page 142)



This new Sanctuary, with complete decoration, the ecclesiastical beauty of which is apparent in the above reproduction of the artist's preliminary rendition, was designed by Professor Lelio de Ranieri in collaboration with J. M. Mosher, Architect, for St. Cecilia's Church of Pawtucket, R. I., Rev. Mathias A. Hebert. The Altar is finished in a combination of fine imported marbles with Stations of the Cross and Altar appointments executed in bronze with repousse enrichments. A Pulpit of marble, wrought iron and hand-carved oak rounds out an installation which, in every liturgical detail, reflects the high standards of Bernardini craftsmanship.



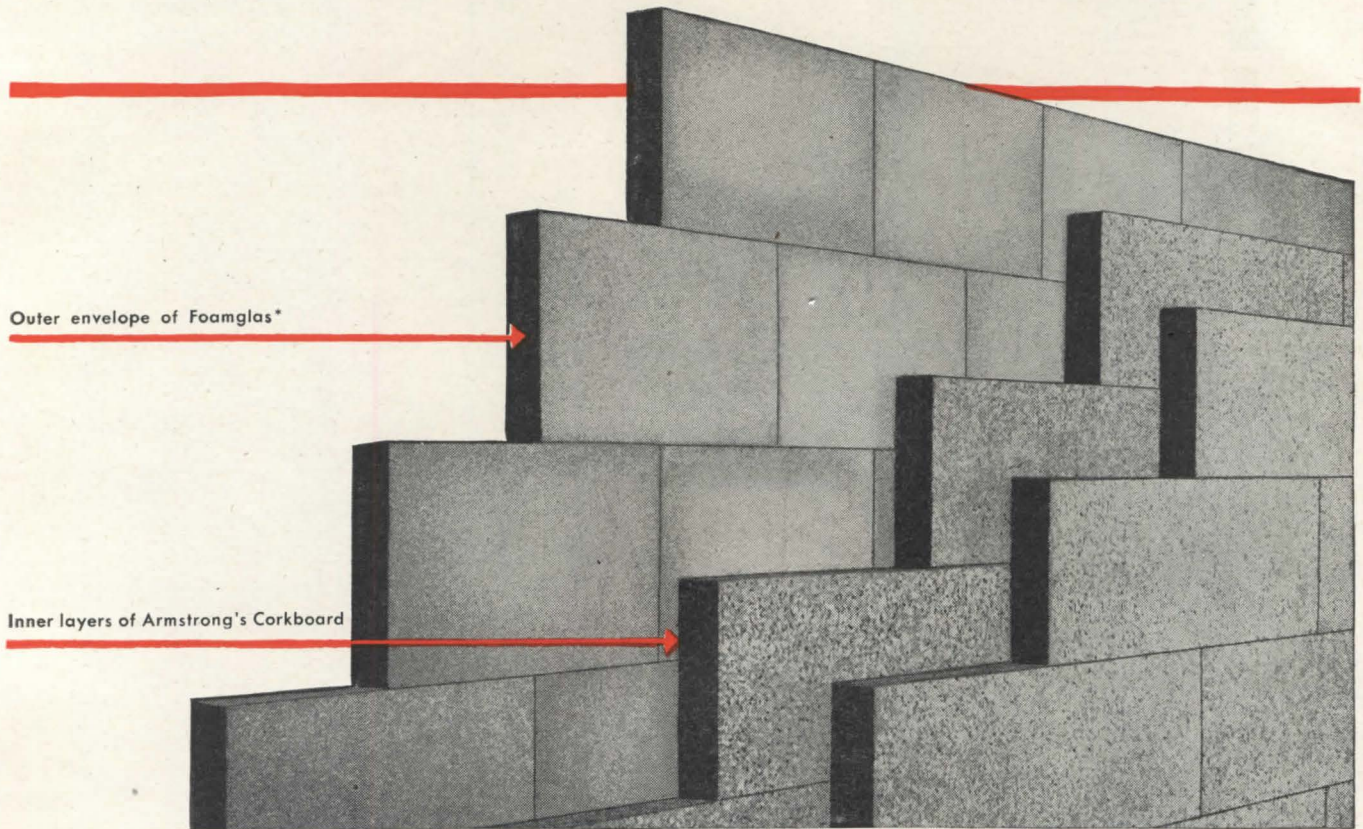
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Refrigerated space that must operate under severe conditions—excessive moisture, wide temperature, and high vapor pressure differentials—can use this new combination construction to advantage. For complete details, including engineering drawings and erection specifications, write today to Armstrong Cork Co., Building Materials Div., 2410 Concord St., Lancaster, Pa.



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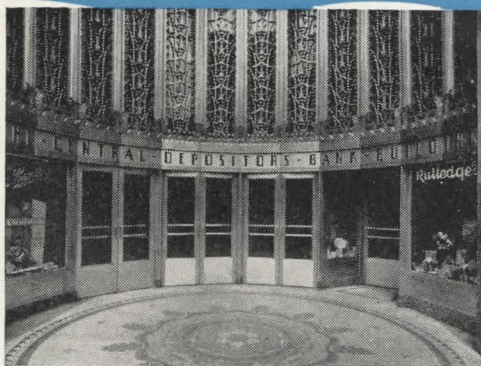


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You'll find plenty of places where aluminum tubing can be used to excellent advantage. For example, conduit as shown in this illustration.

Extruded aluminum has many more uses than just for decoration. Here it is saving weight on both skylights and trusses.



Here is aluminum in multiple form—plate, extrusions, castings and sheet.

Aluminum can be extruded in many shapes to meet individual requirements. This ornamental railing is a typical use for aluminum in this form.



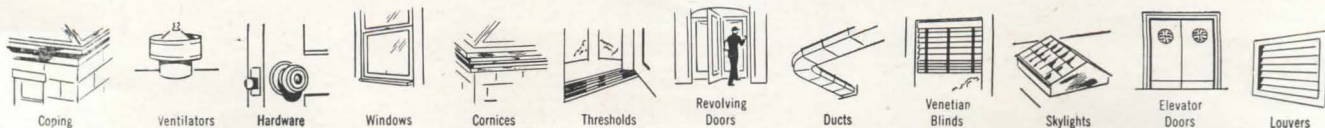
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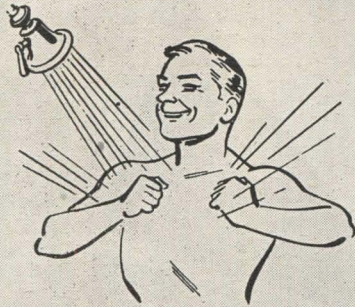


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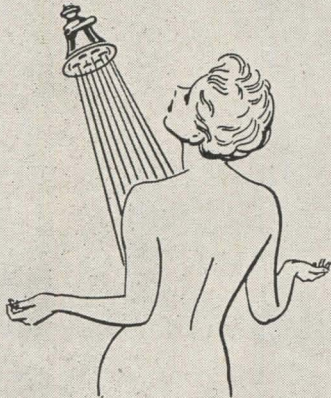
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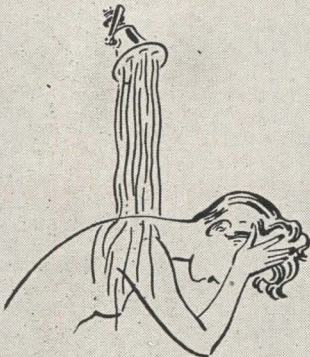
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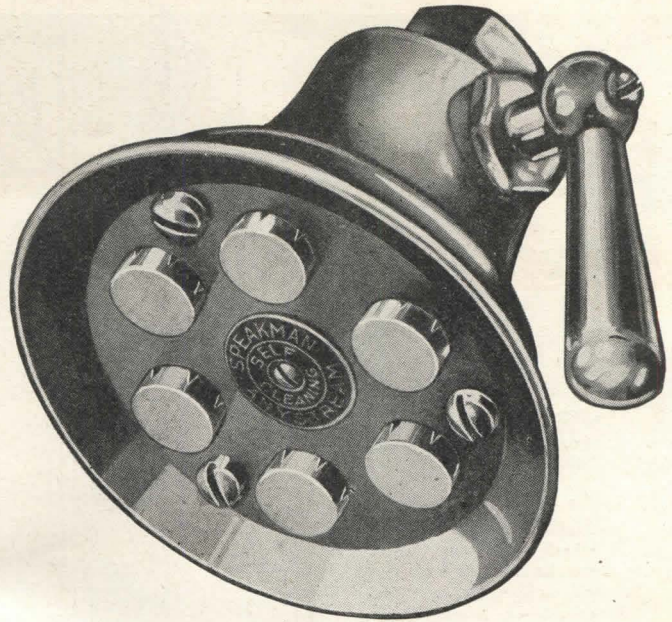
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for no-splash rinse.



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Water Pressure Pounds	30	40	50	60
Ordinary 4" shower head Gallons per minute	9¼	11½	13½	15
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G.p.m. Normal spray	6¼	7¼	8	9
G.p.m. Needle spray	3¾	5	6¼	6¾

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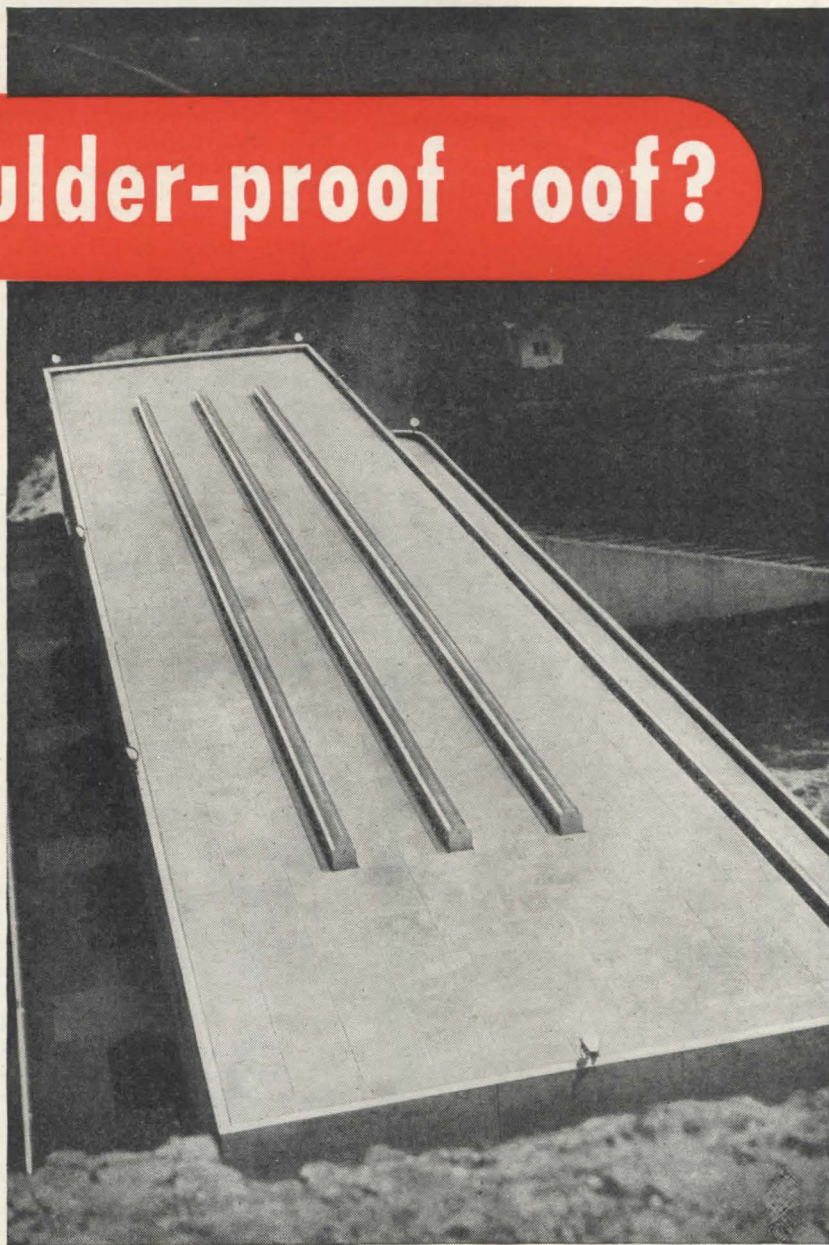
SPEAKMAN COMPANY, WILMINGTON 99, DELAWARE

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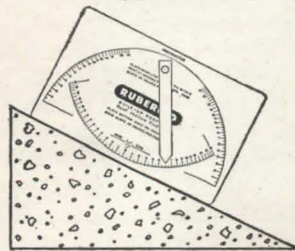
Obviously, roofs like this will stand the roughest treatment. That's why Ruberoid heavy-duty roofs are opening new architectural possibilities in the use of valuable roof areas for the storage of oil drums, heavy equipment—and even as roof parking areas!

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REQUIRED READING

FPHA LOOKS AT HOUSING

Public Housing Design: A Review of Experience in Low-Rent Housing. Washington, D. C., Federal Public Housing Authority, 1946. 7¾ by 10¼ in. viii+294 pp. illus. Supt. of Documents, Washington 25, D. C., \$1.25.

Keynoting this review of the FPHA's 10 years of experience in the low-rent housing field is an awareness that each project must be considered as an individual unit and developed carefully in terms of its own specific environment and the families for whom it is intended. "Canned" plans just will not do the trick, the FPHA has found out.

Nor is this the only lesson the housing agency has learned. Slum clearance, says the FPHA, is not the major goal of public housing: "People must be given first consideration; slum clearance though more spectacular, is merely a by-product of housing underprivileged people." The site plan can make or break a project: it is "a complex thing . . . shaped by climate, by local housing customs, economic conditions and laws; by the location of the site with respect to employment, transportation, utilities, and social institutions; by the cost of the land, the relative cost of various forms of construction and the cost of utilities and maintenance; by the habits, incomes and composition of the families to be housed." Minimum standards not only must be met, they must be met with "intimate and sympathetic understanding of the families to be housed."

The FPHA deserves credit for this volume. In the first place it has not shied away from admitting the errors it has made in the past, but actually stresses them for the benefit of future planners. Secondly, it has assembled chapter after chapter of really helpful material, and illustrated it liberally with photographs and plans.

MORE CITY PLANNING

New City Patterns: The Analysis of a Technique for Urban Reintegration. By S. E. Sanders and A. J. Rabuck. New York 18 (330 W. 42nd St.), Reinhold Publishing Corp., 1946. 8½ by 11 in. 198 pp. illus. \$7.50.

Numerous diagrams, maps and photos, concise thinking and clarity of expression combine to give this latest book on city planning a reader-interest value rather above the average. The material itself, however, follows the usual pattern: an analysis of what is wrong with present-day cities, what to do about it, and how.

Like most able city planners of the day, Messrs. Sanders and Rabuck, both of whom are connected with federal agencies, stress the importance of planning metropolitan regions in their en-

tirety. All levels of government concerned with the planning of a metropolitan area, they say, must be represented in the agency assigned to the job. Powers and duties of such an agency should be specific, and fully covered by proper legislation. Interstate compacts should be entered into whenever a metropolitan region extends into more than a single state. A master plan should be developed and properly administered. And above all, planning objectives must be sound, and broad enough to stretch well into the years and generations ahead.

Familiar as these planning concepts are, they have been presented here with a new freshness and a new urgency. So, too, with the stress the authors place on parks and greenbelts, traffic control and parking areas, decentralization and facility of transportation. These authors know their subject; their readers should profit by that knowledge.

SOLVENT METROPOLIS

The Self-Supporting City. By Gilbert M. Tucker. New York 21 (50 E. 69th St.), Robert Schalkenbach Foundation, 1946. 5 by 7¾ in. 108 pp. \$1.00.

Written in answer to a letter about the cause of city deficits, published in the *New York Herald Tribune*, this small volume offers a plan for making cities self-supporting. The plan is simply this: gradual lightening of the tax on improvements and corresponding increasing of the tax on land until the improvements are entirely tax-free.

This program, Mr. Tucker relates, has been partially tried out in Pennsylvania where, in 1913, the so-called "graded tax law" was passed, providing for a progressive shift of municipal taxes from improvement values to land values in Pittsburgh and Scranton. Results in Pittsburgh are considered good by representative groups of citizens: the Taxpayers' League, for example, "reports that 95 per cent of all home owners now pay lower taxes . . ." and in a typical residential ward, Mr. Tucker reports, "out of a total of 3,272 owners of improved property, only 22 fail to show a saving . . ."

Periodical Literature

APPRAISAL OF NEUTRA

Richard J. Neutra, Architecte: Presentation par Alexandre Persitz. Boulogne (Seine), France (5 rue Bartholdi), L'Architecture D'Aujourd'hui, May-June, 1946, pp. 3-76, illus.

Probably no greater tribute can be paid to an architect than the devotion of an entire issue of an architectural

magazine to a presentation of his work. Particularly when it is a presentation as lavish and as detailed as this of Neutra in *L'Architecture D'Aujourd'hui*. The reason for it, M. Persitz explains as follows: "Following a program that we have set for ourselves, we have recently treated in our pages the problems of modern techniques of building. Now it seems necessary to us, in conclusion, to illustrate the real possibilities of these techniques by realizations which have passed the purely experimental stage. The work of Richard J. Neutra is an admirable example for this demonstration. . . . This architect has, in effect, devoted himself for more than 20 years to the systematic study of methods of rational construction."

BRITISH STANDARDS

Britain Bids for Better Building. By W. H. Deacy, Sr. New York (70 E. 45th St.), Industrial Standardization, Aug., 1946, pp. 187-193, illus.

The thorough-going study of building methods undertaken in Great Britain during the past few years under the Ministry of Works is bearing fruit, this article makes clear, in the development of methods of standardization and mass production which the Ministry is now seeking to apply to housing. "Bricks, doors, and windows," Mr. Deacy reports, "are being made in fewer regulated types; the shells of entire houses are being cast in foam slag and aluminum; kitchens, bathrooms, and heating systems are highly standardized."

British experience with standardization indicates that it is of benefit not only to architects, manufacturers of building materials and equipment, and contractors, but to the general public as well. Production has been stepped up, costs have been reduced. It is with reason that Mr. Deacy asks whether a similar program in this country might not have similar good results.

LOBBY COMFORT

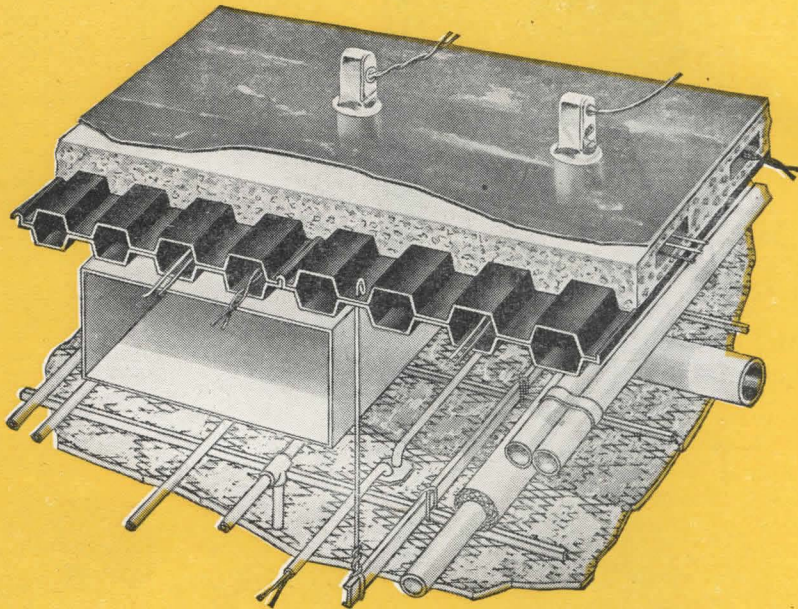
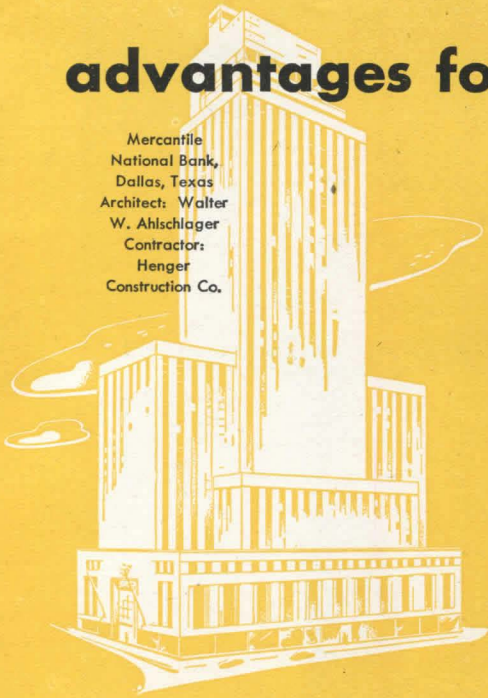
How to Heat Lobbies. By T. W. Reynolds. New York 13 (148 Lafayette St.), Heating and Ventilating, Aug., 1946, pp. 69-72, illus.

The familiar and frequently knotty problem of lobby heating is considerably unkinked in this article by Mr. Reynolds. With the aid of diagrams, he explains various solutions that have proved effective. Included is a description of a method involving the use of overhead circular air diffusers connected to ducts run in the hung ceiling from a unit air heater. Another solution is a forced flow convector, which may be concealed or exposed, with top or front supply grille. Such a unit, Mr. Reynolds says, eliminates the difficulty usually experienced in obtaining the necessary and unrestricted flow of return air.

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The *quick-in* feature of Q-Floor reduces building time 20 to 30%. The Q-Floor becomes an immediate platform for other trades, dry, clean, noncombustible, free from forms and shoring. Work moves ahead fast, even during freezing weather. The time saved is money saved to your client. The *quick-change* feature protects your client's investment against electrical obsolescence.

HERE ARE MORE:

- Q-Floor is made of steel; comes to the job cut to fit; ready to weld to structural frame.
- *Quick-in*—two men can lay 32 sq. ft. in 30 seconds.
- Light weight is desirable for tall buildings.
- Shallow floor construction leaves ample room for mechanical equipment between floor and suspended ceiling.
- Q-Floor requires no preset inserts.
- Total dead weight is less than 40 pounds per square foot, including concrete floor fill and plastered ceiling.
- Yet it has Four-hour Fire Construction, rated by Underwriters.
- The steel cells of Q-Floor are interrelated by crossover raceways so that every six-inch area of the floor can be tapped for electricity.
- An electrician merely drills a small hole for an outlet—the whole job taking only a few minutes.
- *Quick-change* avoids fuss, muss and trenches, even years later.

You can see Q-Floor electrical fittings at any General Electric construction materials distributor. Write for the latest, complete literature on Q-Floor.

THE EASIEST THING FOR A BUILDER TO FORGET: FLOORS ARE WHAT A BUILDING IS FOR

H. H. ROBERTSON COMPANY

2404 Farmers Bank Building, Pittsburgh 22, Pennsylvania



Offices in 50 Principal Cities, World-Wide Building Service



Washrooms are one of the four most important factors in good working conditions—according to a survey in 400 plants.

“A sloppy washroom sure gets my goat!”

TOM: *“This one’s always so shipshape it’s a pleasure to clean up in.”*

BOB: *“You said it! The boss must know we appreciate a good washroom as much as he does.”*

EMPLOYEES judge a company a great deal by its washrooms. In a survey of men and women workers at more than 400 plants, they named these factors as the ones they considered most important in good working conditions: *good washrooms, adequate lighting, proper ventilation and safety devices.*

Besides helping morale, sanitary well-equipped washrooms, with plenty of soap, hot water and good quality individual paper towels, help reduce the number of absences due to colds and their complications. For they encourage frequent and thorough washing that helps prevent germs from spreading.

Haven’t you yourself been irritated by a poorly planned, badly equipped washroom? Then make sure your washrooms are designed to be “Health Zones,” not “Germ Exchanges”—“morale-boosters,” not “temper-testers.”



Good Washrooms begin at the Drawing Board

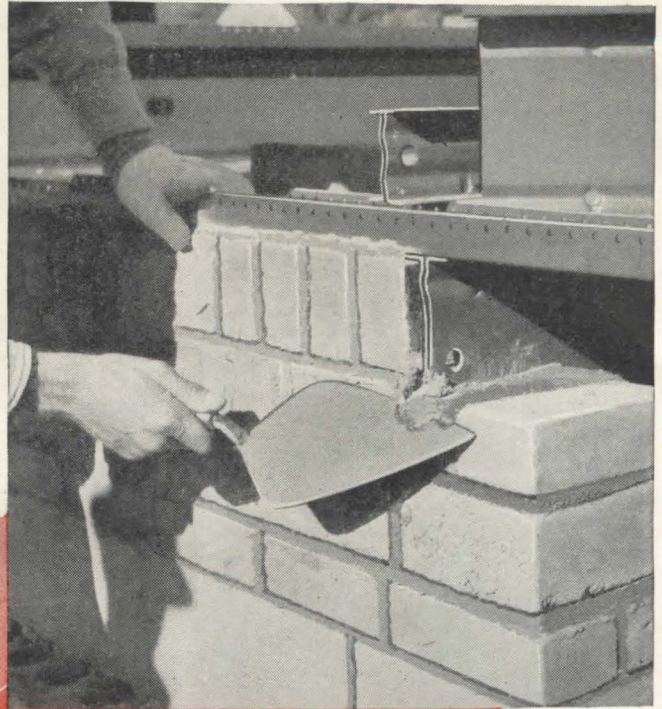
Good washrooms are a result of careful thinking and planning in the blueprint stage. For practical suggestions on modern washroom layout, turn to our four pages in Sweet’s catalog—or call on the Scott Washroom Advisory Service, Scott Paper Company, Chester, Pa.

SCOTTISSUE TOWELS
STAY TOUGH WHEN WET



Trade Marks "Scottissue," "Washroom Advisory Service" Reg. U. S. Pat. Off.

BUILD WITH **STRAN STEEL**



Easy to Design with . . . Easy to Build with



ARCHITECTS find Stran-Steel practical and economical to use. It provides durable, rigid, fire-safe framing of lightweight steel, yet permits wide flexibility in working out designs.

BUILDERS like to work with Stran-Steel. Pre-cut to required lengths, the framing members are assembled with self-threading screws. Other building materials are simply nailed to the frame by means of the nailing groove, a patented feature of all Stran-Steel studs and joists, which grips nails as in a vise, holds them permanently and securely. The frame goes up quickly, without the use of special tools or equipment.

PROSPECTIVE BUYERS are quick to appreciate the advantages of Stran-Steel. It gives homes, apartments, stores and industrial buildings a greater investment value, since sag-, rot- and termite-proof framing means lower maintenance costs.

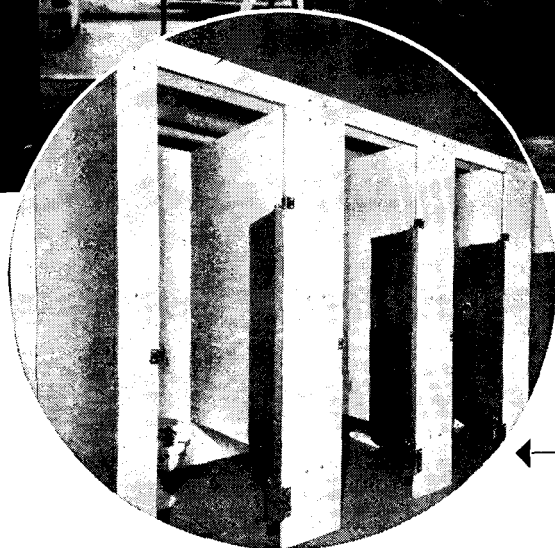
For full details, see Sweet's File, Architectural, Sweet's File for Builders, or the January issue of Building Supply News.

GREAT LAKES STEEL CORPORATION
Stran-Steel Division • Penobscot Building • Detroit 26, Michigan
UNIT OF NATIONAL STEEL CORPORATION



EFFECTIVE USES OF

Glass

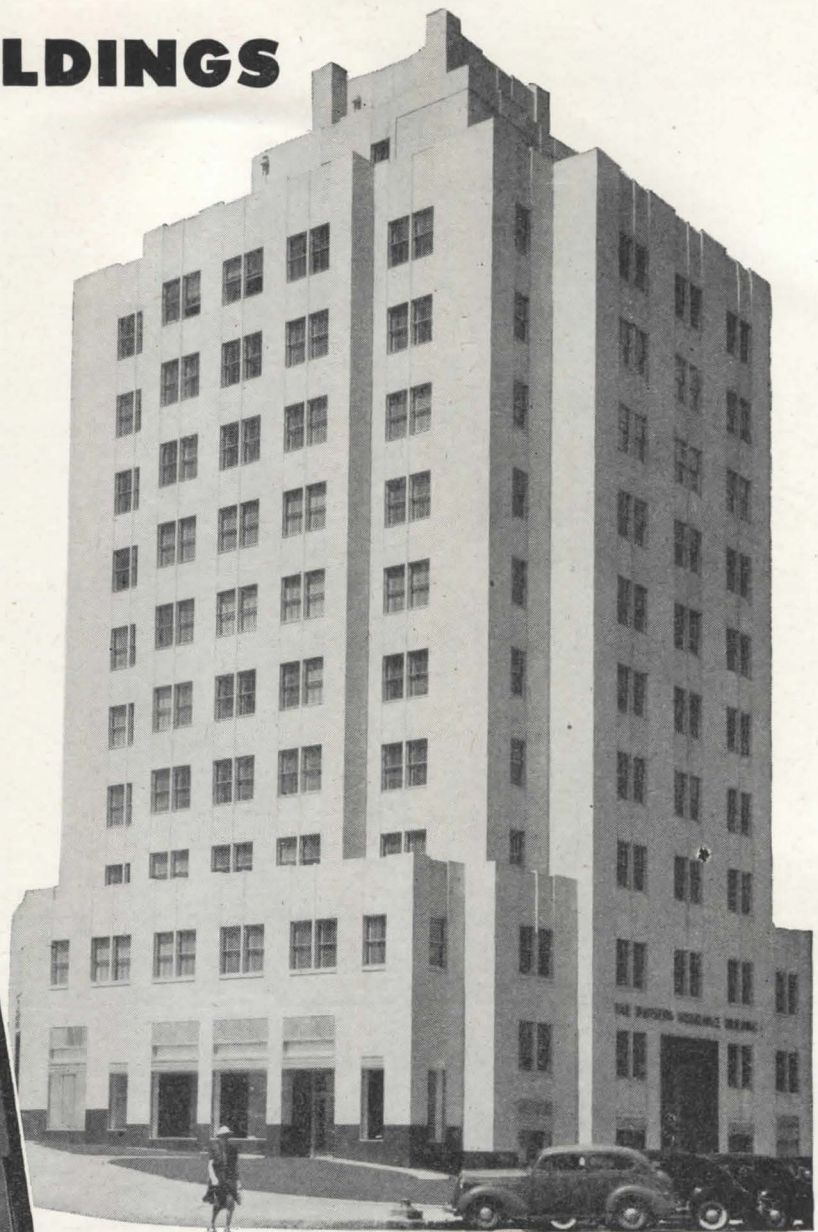


America has produced no better material for toilet room walls, stiles and partitions than Carrara Structural Glass. Its practical qualities of permanence, easy cleaning and strength are as noteworthy as its polished beauty. Carrara is available in 10 attractive colors. Here is a dormitory toilet room, done in Carrara Glass, at Allegheny College, Meadville, Pa. Architect: Jens Frederick Larson.

IN PUBLIC BUILDINGS

A new method of setting Plate Glass was applied in this recently completed Air Lines office. To minimize reflections, the glass was set in a protruding V-shape, protected against light from above by a dark, non-reflecting canopy and from below by plants and a black sidewalk. For such applications as this, Twindow, the window with built-in insulation, is excellent. It allows clear vision, virtually prevents condensation on the glass, cuts heating and cooling costs substantially. Architect: H. Roy Kelley.

Windows in office buildings, both from the design and functional standpoint, merit unusually careful attention from the architect. To be sure of good-looking, clear-vision windows, many architects specify Pennvernon Window Glass, a quality glass which possesses a degree of clarity, freedom from distortion and beauty exceptional in a sheet glass. Twindow, Pittsburgh's new window with built-in insulation, is well suited for use in modern office buildings like this. The Bankers Insurance Building, Macon, Ga. Architect: W. Elliott Dunwoody, Jr.



Stair rails can be beautiful . . . when they're made of Herculite Tempered Plate Glass. Herculite is four to five times stronger than ordinary Plate Glass of the same thickness, much more resistant to impact. This glass—with its combination of strength, transparency and good taste offers the architect new design possibilities both in public building and residential interiors. Architects: Holabird & Root—A. R. Clas, Associate.

We believe you will find much to interest you in our illustrated booklet of ideas concerning the use of Pittsburgh Glass in building design. Send the coupon for your free copy.

★ Design it better with

Pittsburgh Glass



"PITTSBURGH" stands for Quality Glass and Paint

Pittsburgh Plate Glass Company
2341-6 Grant Building, Pittsburgh 19, Pa.
Please send me, without obligation, your booklet entitled: "Ideas for the Use of Pittsburgh Glass in Building Design."

Name.....
Address.....
City..... State.....

PITTSBURGH PLATE GLASS COMPANY



"O.K.—we all agree on Lumite screens. What I want to know is—how many of you are going to live here?"

● Grandpa and Uncle Jasper and Cousin Minnie have plenty of advice to give about the new house. Seems as if they never *would* agree. But one thing was settled from the first—Lumite plastic screens for windows, doors and porches. Your clients have heard about Lumite. Architects *know* that in recommending Lumite they are helping their clients, as well as themselves, to attain the ideal of "the perfect house."

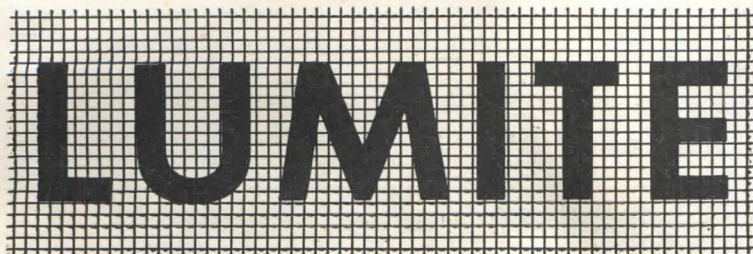
No window eyesores on the Lumite-screened house! Lumite

won't stain or rust . . . keeps its fresh beauty for a lifetime. No screens for Father to paint—Lumite *never* needs painting because the color is *in* the cloth. No screens for Junior to kick out—Lumite will not dent or bulge. And easy for anyone to clean! A wipe with a damp cloth keeps Lumite sparkling like new.

Recommend Lumite for a house that you and your clients will be proud of!

We'll be glad to send you our A. I. A. 35P folder, with sample.

LUMITE DIVISION, Chicopee Manufacturing Corporation
47 Worth St., New York 13, N. Y.



MODERN PLASTIC INSECT SCREEN CLOTH

HERE'S WHY LEADING ARCHITECTS SPECIFY LUMITE:

- Cannot stain
- Won't rust or rot
- Never dents or bulges
- Needs no painting
- Color cannot fade
- Easy to frame
- Lighter in weight
- Sensibly priced
- Lasts years longer
- Woven of Dow's Saran
- Strong! (Lumite is woven of heavy gauge plastic filament—0.015")




Streamline your
Traffic-with Kentile!

KENTILE can be laid so that you have traffic lanes right in your floor—directing customers to counters—to special displays—to whatever spot you want. That's because Kentile comes in squares, to be laid in any pattern you want, and the tiles can also be cut to fit any special pattern.

QUIET, TOO! Kentile "cushions" sounds—is soothing to nerves usually irritated by hard, clicking heels. Moreover, super-durable Kentile shrugs off heel jabs, scuffs and scars. And because colors run through to the back, Kentile colors can't "wear off" and come clean with simple soap-and-water mopping. Thus, when day is done, your Kentile floor looks good as new and is ready for more!

KEEP IT FOR YEARS! Foot for foot, Kentile is the lowest cost floor covering you can use. Furthermore, it lasts for years! (Some fresh-as-new Kentile floors are in their 15th year of service.) And when alterations or replacements are necessary, all you do is replace the squares affected—you don't rip up the whole floor. And because Kentile is speedily laid, and never buckles, even the initial cost represents a savings.

Altogether, Kentile offers 15 different advantages. They're all told in the new, richly illustrated full-color catalogue that shows all the Kentile colors and some of the countless patterns possible—plus full-color pictures of Kentile in actual use. Send for your copy today—no obligation.



GREASEPROOF KENTILE costs only slightly more than regular Kentile—and can be used only where needed.

DAVID E. KENNEDY, Inc.

78 Second Avenue, Brooklyn 15, N. Y.

208 Bona Allen Bldg., Atlanta 3, Ga.

778 Natoma St., San Francisco 3, California

58 E. Washington St., Chicago 6, Illinois

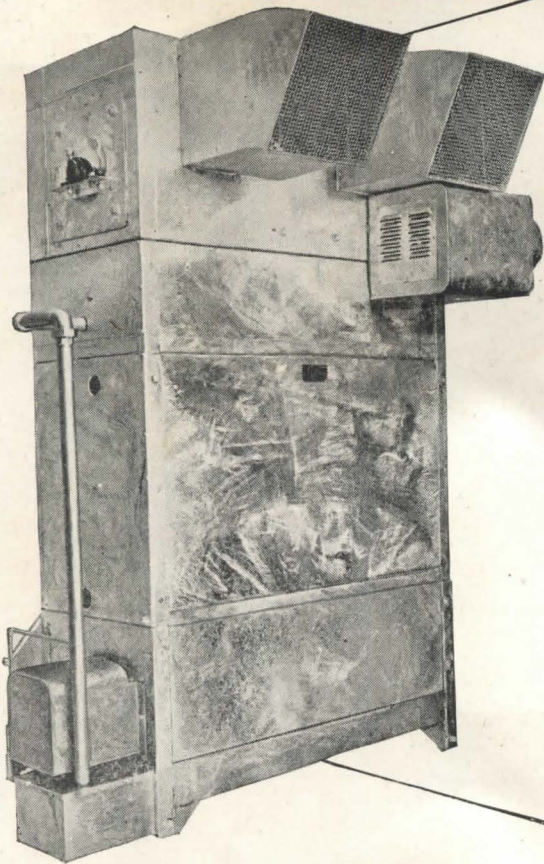
452 Statler Bldg., Boston 16, Mass.

614 Olympia Road, Pittsburgh 11, Pa.

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KENTILE
Asphalt Tile
Trade Mark Reg.





BIG JOBS
and small -

90 EVAPORATIVE CONDENSER. One of Carrier's full line of condensers. It's designed for installations requiring five tons or more. Suitable for "Freon 12" or ammonia. Though self-contained, it's built in sections for easy handling and erection. Centrifugal fans permit the use of intake and discharge ducts. Unit is hot-dipped galvanized after fabrication, making it weather-proof.

CARRIER UNITS FIT THEM ALL

Whatever the air conditioning or refrigeration needs of the building you're planning, you can find exactly the right compressor or condensing unit in Carrier's complete line. Carrier products range from 1/4-hp. units for small display cases to the famous Carrier centrifugal machine with a capacity up to 1200 tons; from the Room Air Conditioners for individual rooms and offices to Conduit Weather-master systems for hotels, apartments,

hospitals, and other multiple-floor buildings.

The wide choice of Carrier air conditioning and refrigeration means economy. These units provide the best balance of initial investment costs and operating costs. They make it unnecessary for your client to pay for more capacity than actually needed for efficient air conditioning and refrigeration. They keep his operating costs at a minimum.

Carrier apparatus has been proved by actual tests in the field. It is precision built of quality material. The design is the result of Carrier's unrivaled experience. Carrier's engineers have worked successfully with architects and consulting engineers on all types of installations. When you specify Carrier equipment, your client can count on years of trouble-free, economical operation. Carrier Corporation, Syracuse, New York.

Carrier

AIR CONDITIONING
REFRIGERATION
INDUSTRIAL HEATING



The
Master
Library
uses the
Master
Decorative
Material

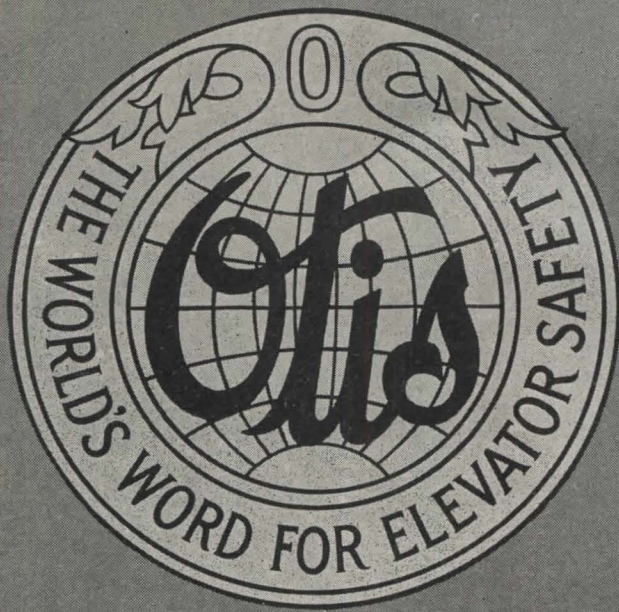
STARTED with \$5,000 and 1,000 volumes in 1802 the library of Congress now spends \$2,000,000 annually, owns 8,000,000 books and major documents, and in 1938 completed a beautifully functional nine million dollar annex designed by Pierson and Wilson.

The Library of Congress is truly a master library for it set the catalogue system style for *all* libraries in the United States, it records *all* copyrights, and has set the pace in library science and, now, in library architecture and decoration.

The Formica laminated plastic used in catalog and reading rooms, and as table tops is the material which is setting the pace for all functional buildings. It meets the difficult requirement of being the most beautiful and the most practical and the most flexible and adaptable.



THE FORMICA INSULATION COMPANY, 4651 SPRING GROVE AVENUE, CINCINNATI 32, OHIO



LOOK FOR **UNWRITTEN SPECIFICATIONS, TOO**

There are written and unwritten specifications. The ones by which size and shape and breadth and depth are regulated are the written specifications. The ones upon which prestige is built are the unwritten specifications.

Speed, load, car size, controls, such terms as these are familiar in the written specifications for an elevator.

Safety, satisfactory service, economy of operation, long life, these are associated with the unwritten specifications of an elevator or escalator manufactured by Otis. They are the end results of the skills perfected by experience and the determination to provide the finest vertical transportation possible.

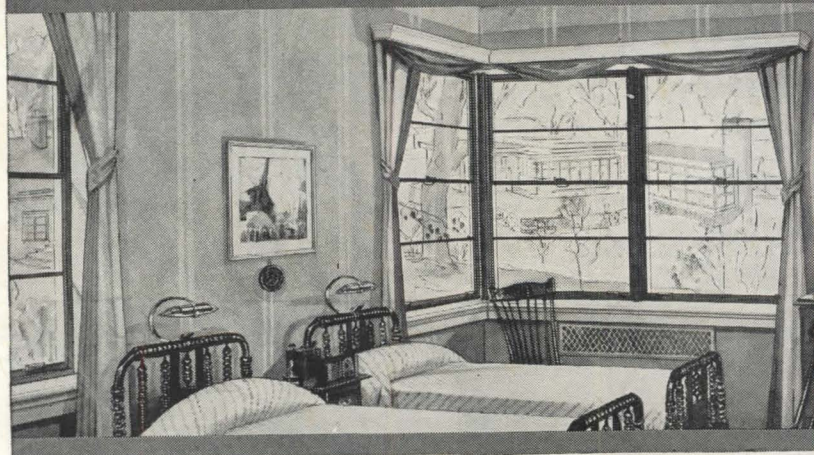
OTIS ELEVATOR COMPANY

Offices in all principal cities

long, pleasing horizontal lines
for smart, distinctive modern design



TRUSCON *Residential* DOUBLE-HUNG WINDOWS



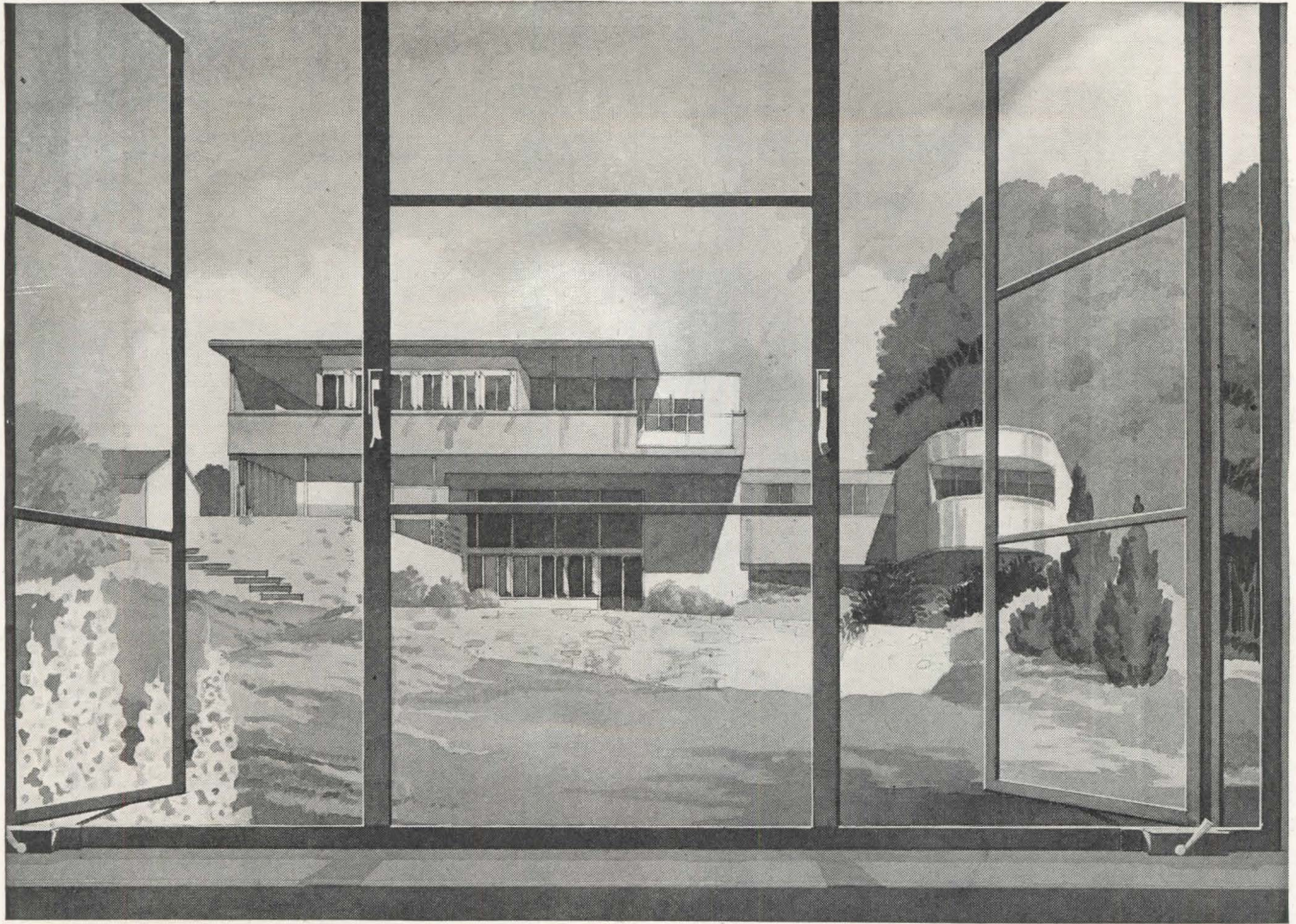
For absolute harmony in the most streamlined modern design, or for adding new zest to the most conventional structures, utilize the bright, sparkling, newness of Truscon Double-Hung Steel Windows. Their smooth, sweeping lines permit single or group arrangements that achieve exterior distinction and interior smartness. This window is also furnished in colonial muntin designs.

Truscon Residential Double-Hung Windows offer many features not found in other windows of similar type or function. Of major importance is the fact that the sash members are of tubular construction. This adds greatly to the strength, insulating value, durability and finished appearance of the window. Weights and pulleys are absent. Operation is controlled by spring balances located on the head and equipped with tapes of Enduro stainless steel. Quiet, positive action and long trouble-free life are assured. Write for detailed information on Truscon Residential Double-Hung Windows today.

TRUSCON STEEL COMPANY

Reg. U. S. Pat. Off.
YOUNGSTOWN 1, OHIO • Subsidiary of Republic Steel Corporation

Manufacturers of a Complete Line of Steel Windows and Mechanical Operators... Steel Joists... Metal Lath... Steeldeck Roofs... Reinforcing Steel... Industrial and Hangar Steel Doors... Bank Vault Reinforcing... Radio Towers... Bridge Floors.



Lupton Steel Casements accent the modern design of this residence of Oscar Stonorov, A.I.A., in Chester County, Pennsylvania.

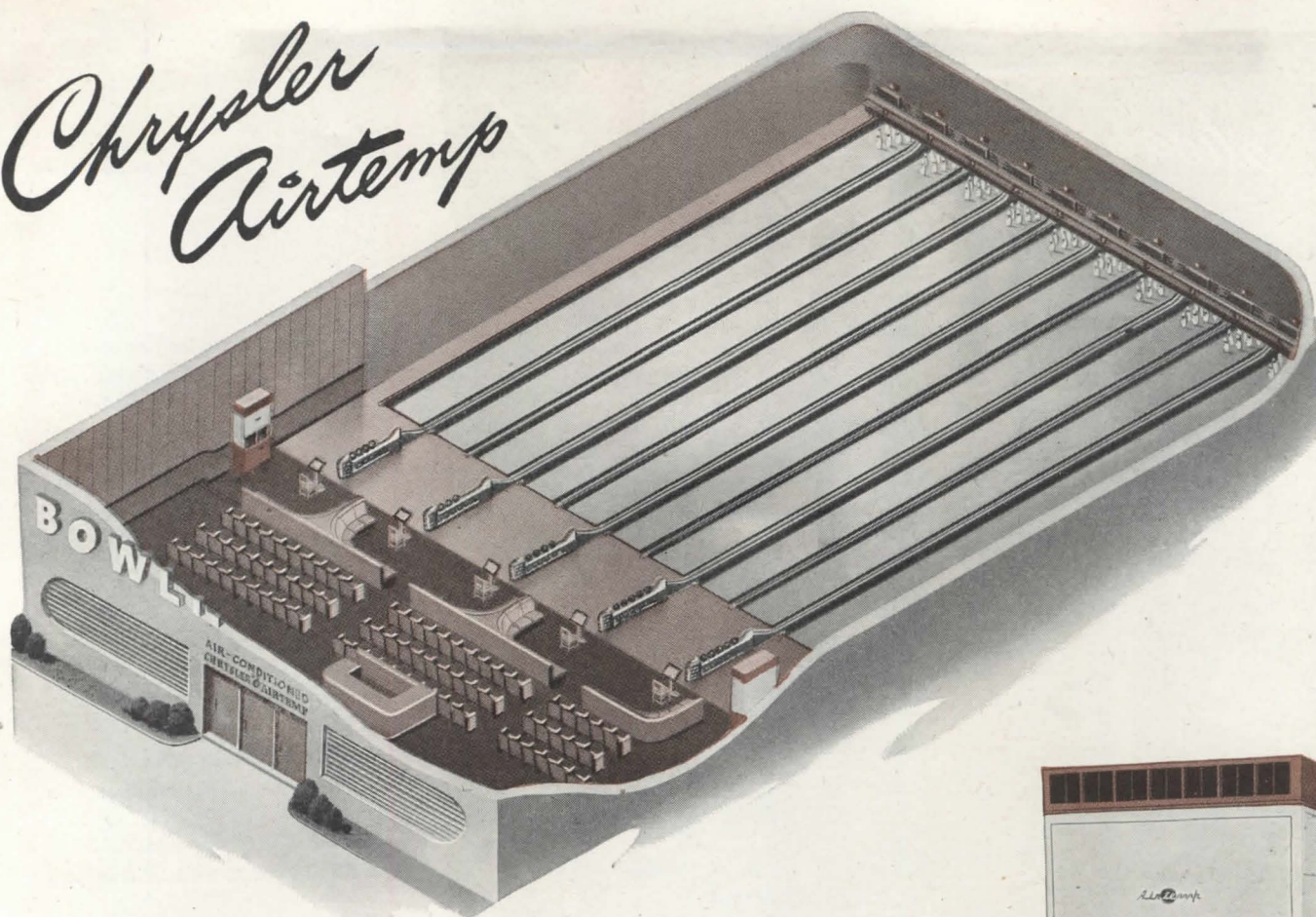
Built on the foundations of a 150-year-old farmhouse, this large country home uses Lupton Steel Casements to make every room a "room with a view". And that's mighty important in this rolling Pennsylvania farm country. In the finest residential construction or in the new low cost houses, Lupton Casements afford positive assurance of abundant daylighting, draft-free ventilation, fire-proof construction. Lupton Casements are complete units, ready for quick, low cost installation. Trouble-free operation and simple, effective screening mean lower maintenance costs. Write for the new 1946 Catalog or see our Catalog in Sweet's.

MICHAEL FLYNN MANUFACTURING CO.
E. Allegheny Avenue at Tulip Street, Philadelphia 34, Pa.

LUPTON

METAL WINDOWS

*Chrysler
Airtemp*



You Can Make Bowling Profitable Every Month

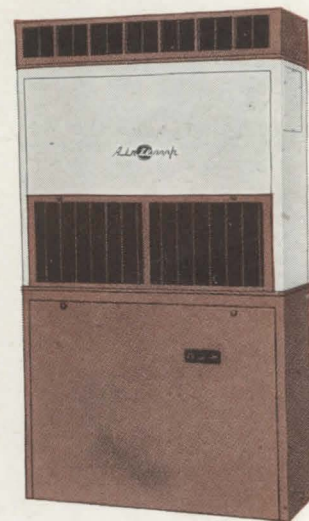
Remember when bowling was a Winter sport only? Operators who have installed air conditioning will tell you that it's a year-round activity today, with great money-making possibilities. Extra Spring, Summer and Fall business quickly pays for air conditioning.

Architects will find that it is easy—and more economical—to air condition bowling alleys with the famous "Packaged" Air Conditioners pioneered by Chrysler Airtemp. "Packaged" Air Conditioners fit readily

into any plan, are easily and quickly installed.

Each "Packaged" Air Conditioner is a complete and automatic air conditioner in itself. It cools its own zone, operates independently as the load requires.

Heating coils can be added to "packages" to provide simplified year-round air conditioning. Airtemp Division of Chrysler Corporation, Dayton 1, Ohio. In Canada: Therm-O-Rite, Ltd., Toronto, Ontario.



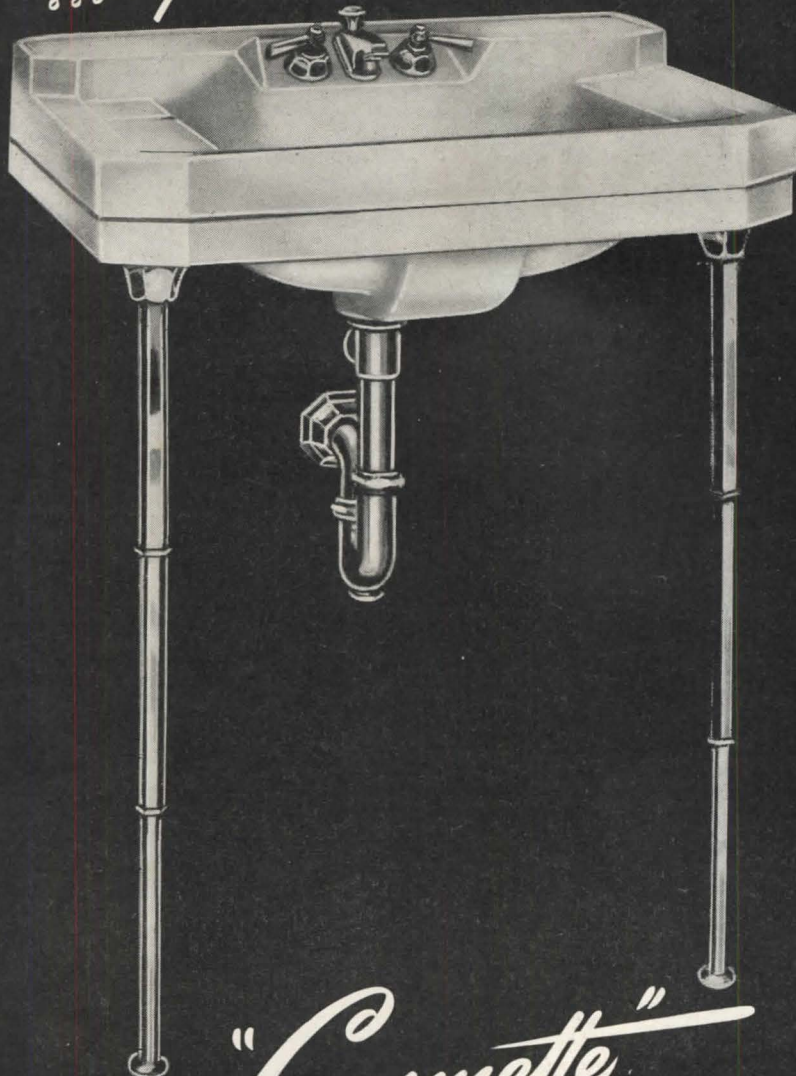
"Packaged" Air Conditioner

Air Conditioning was simplified with this development by Chrysler Airtemp. "Packaged" Air Conditioners operate automatically, require a minimum of attention, have long life and are very economical to operate.

CHRYSLER  **AIRTEMP**

HEATING • COOLING • REFRIGERATION

*always Popular
... again in Production!*



the "Cosmette"
LAVATORY
PATENTED

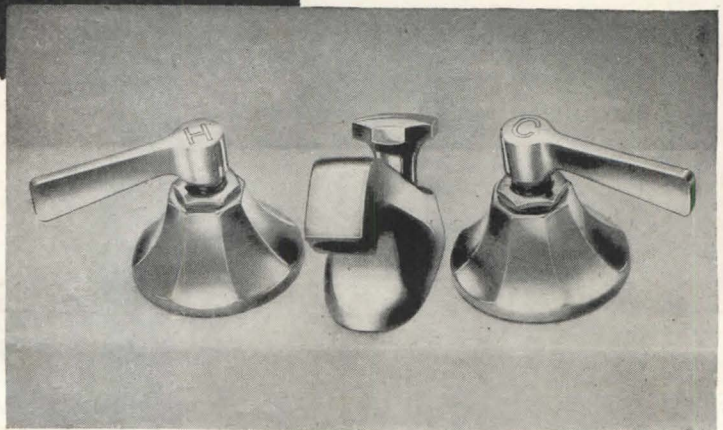
- So attractive to the eye as well as the budget, so generous in usable area, so skillfully designed to fit limited bathroom space... this is the *Cosmette* of 1946! Produced by Case and distributed nationally—see your Classified Telephone Directory or write W. A. Case & Son Mfg. Co., Buffalo 3, New York. Founded 1853.

- Dry shelf space for toilet articles.
- Built-in soap dish.
- Concealed front overflow.
- Towel bars, if required, free from the wall.
- Wall hung or with legs.
- All exposed parts chromium-plated brass.
- 20" x 13½" and (for production soon) 24" x 16½".

Case

PLUMBING FIXTURES

● **NO. 90 EASY-ACTION "SLANT-BACK" FITTING.** A fully chrome-plated fixture with permanent non-splash device. Design provides for easy renewal of any wearing part or the entire unit.





METAL PAINTED WITH
RED LEAD
GETS PLUS PROTECTION

Red Lead "Soaps"

help make Paint Film
Tough...Flexible...Water-Resistant

While maintenance engineers know, by long experience, that Red Lead helps *make metal last* . . . and widely accept it as the standard metal protective paint . . . it remained for modern science to show exactly *why* Red Lead so effectively inhibits rust.

One of the important reasons is Red Lead's ability to react with the vehicle, and produce unique lead "soaps."

These soaps grow to form a tough, impervious, intermeshing matrix within the paint film, as shown in the photomicrograph at right.

The soap formations increase Red Lead's protective power in several ways. For one thing, they *mechanically* reinforce and toughen the paint film.

At the same time they contribute all-important flexibility, allowing movement all along their soft, intertwining projections. This helps prevent the ruptures to which a hard unyielding film is subject.

Moreover, lead soaps slowly form primarily in the dry paint film as it ages. This is where the soap formations impart their greatest benefits. When a paint film weathers and ages, decomposition products of the vehicle are formed. Red Lead's ability to slowly combine with these decomposition products actually enhances the life of the paint film. Red Lead's slow rate of reaction means the film age-hardens at a slower rate. It thus retains a high degree of flexibility, a great factor in its lasting adhesion.

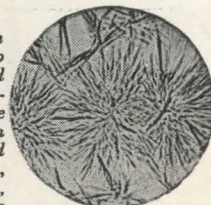
And again, the very structural formation of the soaps, with their dense, impermeable matrix of interwoven fibres, helps to restrict the passage of moisture through the paint film. Metal cannot rust without the presence of moisture.

Specify RED LEAD for ALL Metal Protective Paints

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint.

No matter what price you pay, you'll get a better paint for surface protection of metal if it contains Red Lead.

This photomicrograph shows the distinctive lead soap formations resulting from Red Lead's reaction with the vehicle. Note how the rod-like projections, radiating from central cores, spread out and intermesh. This makes a strong, flexible, interwoven structure, just as individual fibres in a piece of cloth are woven to make the cloth strong and durable. This type of soap formation is unique with lead paint films.



Here you see the standard apparatus used for measuring the water permeability of paint films.

With this equipment a measure of the amount of water that passes through a unit of film is obtained.

Experiments show that a straight linseed oil film allows three times as much water to pass through the film as when the same film is pigmented with Red Lead . . . illustrating once more the beneficial protective action of Red Lead and Red Lead "soaps."



Write for New Booklet—"Red Lead in Corrosion Resistant Paints" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6; Buffalo 3; Chicago 80; Cincinnati 3; Cleveland 13; St. Louis 1; San Francisco 10; Boston 6, (National Lead Co. of Mass.); Philadelphia 7, (John T. Lewis & Bros. Co.); Pittsburgh 30, (National Lead Co. of Pa.); Charleston 25, W. Va., (Evans Lead Division.)



Dutch Boy
Reg. U. S. Pat. Off.
Red Lead

FLOORS IN HOSPITAL ADDITION

built with

Open-Web
JOISTS

This eight-story, 52 room steel-and-brick addition to the New Rochelle, N. Y., Hospital was built with Bethlehem Open-Web Steel Joists in the floors—not only to provide stiffness, but for protection against fire hazards.

Bethlehem Open-Web Joists are ideal for use in light occupancy structures because they never shrink or sag. Hence there's no cause for concern about squeaky floors, open baseboards or cracks in plaster. They are immune to termites. When used with concrete floor-slab and plaster ceiling in fire-safe construction they safely withstand fire for over two hours.

Bethlehem Open-Web Joists speed the installation and concealment of pipes, conduits and ducts. They're easy to install, too, for they arrive at the job completely fabricated, ready to erect without falsework. Two men can handle standard Open-Web Joists. And the Longspan type of joist (mak-



Eight stories in height, this 50 bed, solarium-equipped addition to the New Rochelle Hospital, New Rochelle, N. Y., used 32½ tons of Bethlehem Open-Web Joists. Contractor: Turner Construction Co., New York. Architects: Shreve, Lamb & Harmon Associates, New York.

ing possible column-free floor spaces up to 64 ft. in width) can be installed by means of a light gin pole.

Ask for a copy of Folder 522. You'll find it helpful in designing with Bethlehem Open-Web Joists. Write to the nearest Bethlehem district office, or to Bethlehem, Pa.

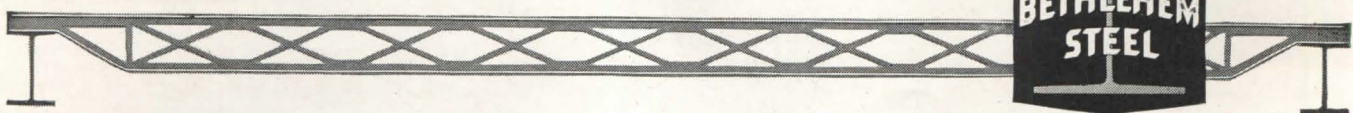
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products
are sold by
Bethlehem Pacific Coast Steel Corporation

Use

**BETHLEHEM STEEL JOISTS
FOR HOTELS... STORES
APARTMENT HOUSES...
OFFICE BUILDINGS
... DORMITORIES...
HOSPITALS... SCHOOLS
... HOMES**

BETHLEHEM OPEN-WEB JOISTS



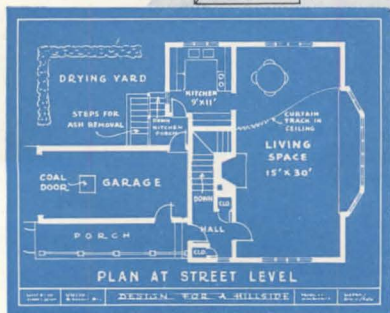
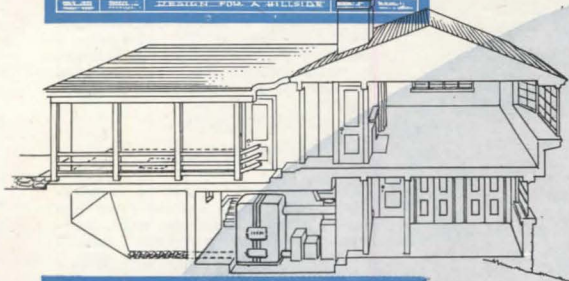
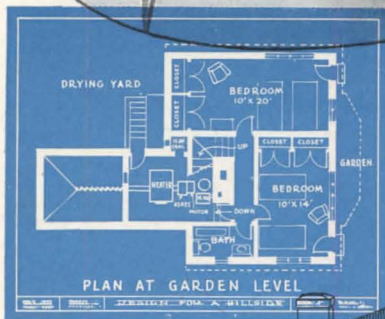


... FOR A HILLSIDE

LESS EXCAVATION.. MORE HOUSE



... AND Fully Automatic COAL HEAT!



This little house on a hill is the solution to many designers' problems. It offers the economy of a one story home with the advantages of a two floor plan! It can be built on a steep and rocky lot with a minimum of expensive excavation, since the partial basement fits into the slope of the lot. Living and dining spaces are at the top of the house, overlooking neighboring homes and affording a grand view. If the house is placed close to the street, a maximum of secluded garden space may be provided on the lower side, close to the living room and bedroom windows.

ECONOMY is the key factor in building the 11 million new homes needed in the next few years. The heating facilities you select will play a major part in the economy and salability of houses you design or build. The heart of this livable home is an economical, fully automatic coalburning heating plant, with easy access provided to the basement from all parts of the house. Coal heating . . . whether fully automatic as above, or hand-fired with automatic controls . . . is the most satisfactory and economical in the long run.

A coal heating plant is the only installation that can be converted to all other types of heating—when you design or build, play safe, provide coal storage space and chimneys adequate for any fuel. Design for coal . . . "Fuel Satisfaction". It is economical, safe, clean, quiet, odorless and abundant.

Norfolk and Western RAILWAY

CARRIER OF FUEL SATISFACTION

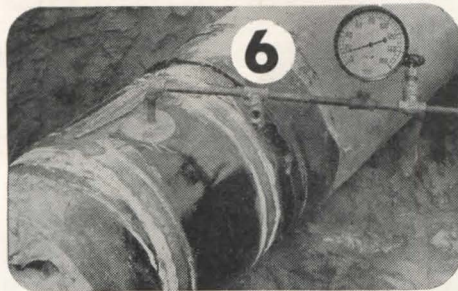
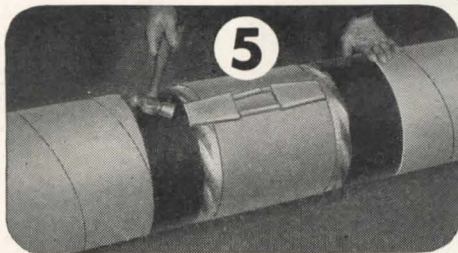
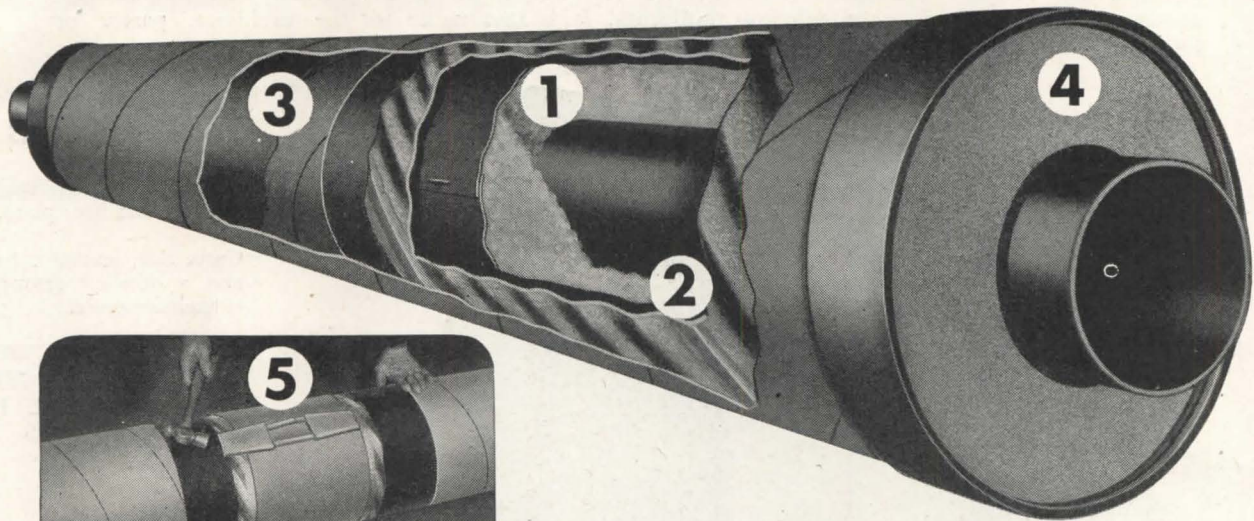
Unique design of this home places bedrooms on the lower floor with combination living and dining room directly above—all away from the street for quietness, privacy and maximum view. This is an ideal design for homes along rivers and lakes, or for those in any city.

- INITIAL COST ECONOMY. A hand-fired coal furnace is the least expensive of all central heating plants.
- AUTOMATIC HEATING. The cost of a stoker-fired coal furnace is no greater than the cost of a good installation using any other fuel, over a period of time . . . economy in cost of fuel is the saving.

- FULLY AUTOMATIC HEAT. The ultimate in cleanliness, safety, comfort, convenience and economy, is a bin-fed, ash removal, coal-burning stoker—the cost is little more than a regular stoker.
- CLEAN, SMOKELESS FUEL. Coal today is sized, cleaned, and dustproofed at the mine.

- PLENTIFUL FUEL SUPPLY. We have a three thousand year coal reserve. Other fuels may be exhausted while your building is still relatively new.
- CONVERSION POSSIBILITIES. A conversion burner can be installed economically in a coal furnace. The reverse is not possible. Be safe . . . provide for coal.

Only **RIC-WIL STEAM CONDUIT**
gives you ALL these advantages



- 1** High-rating thermal insulation of required thickness applied to 21 ft. pipe—with sealed air space between insulation and housing.
- 2** Structurally strong, shock proof conduit housing seam-welded and hot-dip galvanized—permitting installation in shallow trenches.
- 3** Double coating of high melting-point asphalt, reinforced with felt wrapper—assuring long life and low maintenance.
- 4** Stuffing-box pre seal rings on ends of conduit protect against water damage during construction—permitting installation regardless of weather or trench conditions.
- 5** Simplified connector speeds coupling of 21 ft. prefabricated sections in the field and facilitates making welded closures.
- 6** Full-welded conduit design and field-welded connections insure pressure-tight system. Air test may be applied before backfilling.

When specifying conduit for underground (or overhead) steam distribution lines insist on Ric-wil to obtain these features for the most efficient, maintenance free, permanent system.

All-welded construction means a pressure-tight conduit capable of meeting air-pressure test. Conduit casing is 16-gage corrugated iron, seam-welded and hot-dip galvanized after welding. Simplified connector is readily welded to smooth conduit ends, held in place by drive clamps . . . Ends of conduit are presealed at the factory with a heavy pre-cast cylinder to protect insulation during storage on the job and installation—regardless of water conditions encountered . . . Triple protection against the elements is insured by Ric-wil specifications for conduit covering. First, a thick coating of high melting-point asphalt is applied over casing. Second, asbestos felt

is tension wrapped around conduit before asphalt is set. Third, another coating of asphalt is applied, which is finally protected by spirally wrapped heavy kraft shipping paper . . . Installation is greatly simplified, saving time and money on the job. Prefabricated 21 ft. sections, also prefabricated accessories—including expansion loops, elbow, tee-branch and anchor units, are furnished with ends fitted for easy coupling in the field. Because of the conduit's inherent strength, only 18" of ground cover is required, even under trucking roads, minimizing excavation and back-fill. Pipes can be turned in conduit so that all pipe welding is done on top. Installation interferes little or none with other construction.

If you have not yet used the full-welded Ric-wil Prefabricated Insulated Pipe Units, specify them on your next job and be assured of the best. Descriptive Catalog on request.

RIC-WIL INSULATED PIPE CONDUIT SYSTEMS
THE RIC-WIL COMPANY · CLEVELAND, OHIO
AGENTS IN PRINCIPAL CITIES

OUT IN FRONT..



That's Where Selling Begins

YOU can't sell 'em if they don't come in and a distinctive Brasco Front stimulates the buying urge as nothing else can. It halts the shopper, leads her eyes right into the store and her footsteps follow almost involuntarily.

The architect plans it that way, with large expanses of plate glass to permit direct vision within and an entrance area artfully devised to seem part of the store itself.

With complete Brasco Construction, today's unique fronts are not only practical but moderate in cost and easy to install. Brasco engineering fully provides for the mechanics of modern design with heavy-gauged members, adequately reinforced, and patented retaining sash for utmost glass protection.

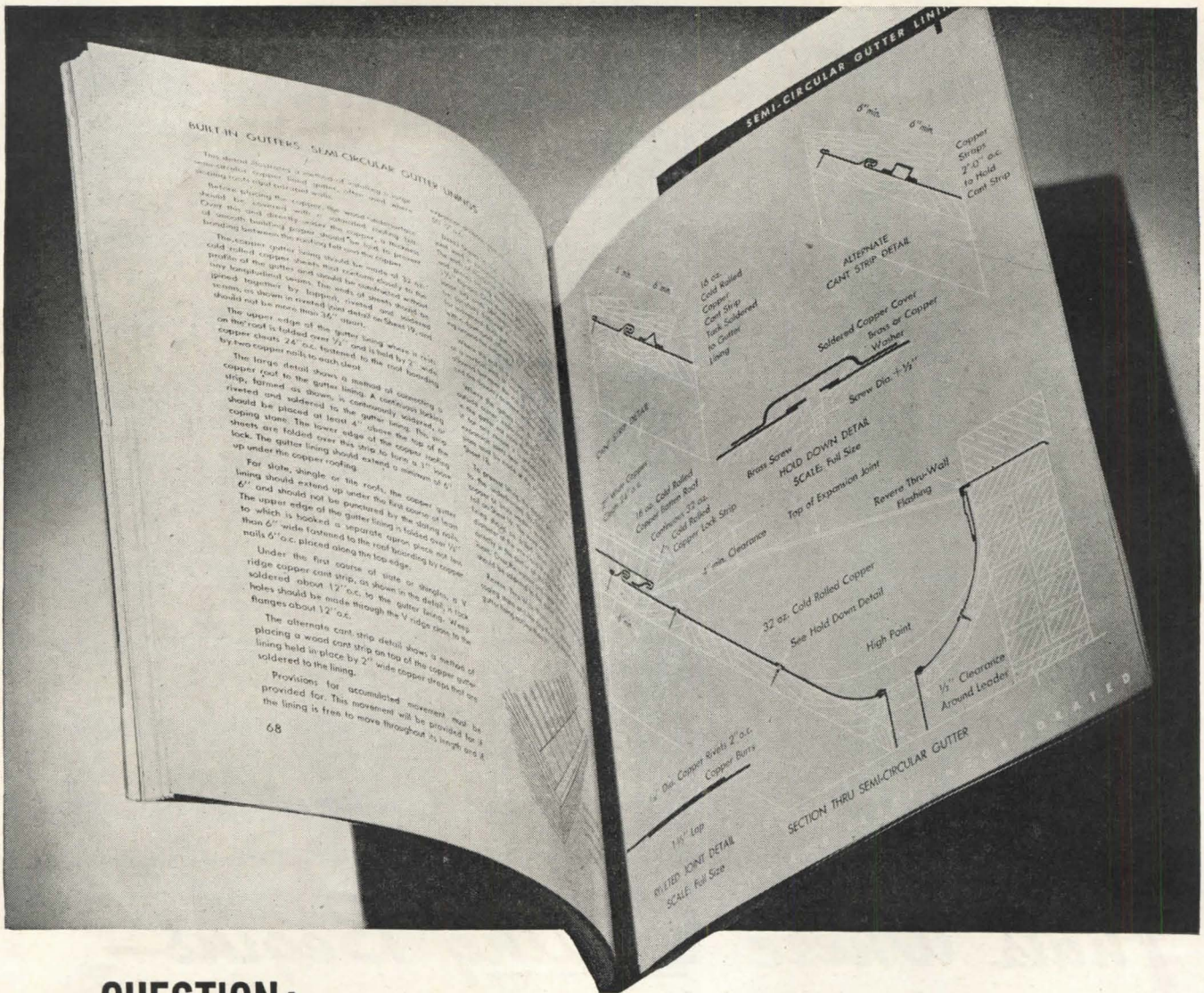
These and other exclusive features give Brasco preeminence in the field of modern store front construction, as proven by our thirty-year record of outstanding installations, coast to coast.

A COMPLETE LINE FOR EVERY DESIGN

Brasco
MODERN
STORE FRONTS

BRASCO MANUFACTURING CO.
HARVEY • (Chicago Suburb) • ILLINOIS

National Distribution Assures Effective Installation



QUESTION:

What's the best way to install semi-circular gutter linings?

ANSWER:

Detail Sheet 19, Pages 68 & 69 in "Copper and Common Sense"

A QUICK SOURCE of reference for busy men, Revere's 96-page book, "Copper and Common Sense" is based entirely on authoritative new data provided by Revere's sheet copper research. The new principles it covers show how stress failures can be avoided through engineering design.

In the few months since it was published, this book has become the standard reference for leading architects and sheet metal experts in all parts of the country. That is because the facts it covers are important to every one concerned with better sheet copper construction, and are presented in the form of large, clear charts that are easy for practical men to use.

Copies of this book are now in the hands of all holders of Sweet's Architectural File, and of leading sheet metal contractors. We urge you to use this book,

to turn to it first in all matters of sheet copper construction. It covers every phase of the subject—roofing, gutters, flashing—in full detail. For any further assistance, feel free to call on the Revere Technical Advisory Service, Architectural. Revere building products are sold only through Revere Distributors.

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At Least a

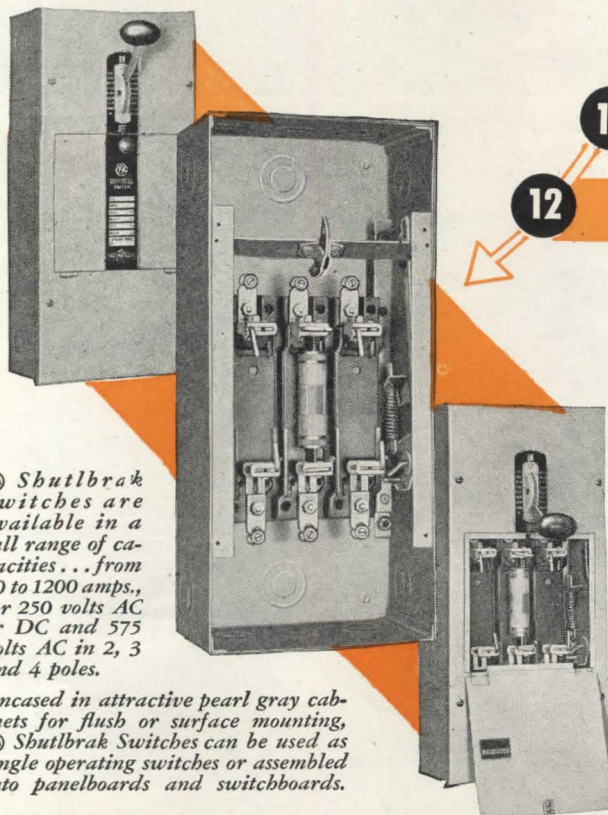
Dozen Reasons

WHY YOU'LL LIKE



SHUTLBRAK ENCLOSED SAFETY-TYPE SWITCHES

There are many reasons for the mounting popularity of FA Shutlbrak Switches. Some say, for instance, they like its easier, split-second speed of operation . . . its new shuttle mechanism feature that gives quick make and break connections. Others say it is the simplicity of design that appeals to them . . . ample knockouts and wiring space at top, bottom and back. Still others say it is its trouble-free service and many practical safety features . . . its long lasting economical operation.



FA Shutlbrak Switches are available in a full range of capacities . . . from 30 to 1200 amps., for 250 volts AC or DC and 575 volts AC in 2, 3 and 4 poles.

Encased in attractive pearl gray cabinets for flush or surface mounting, FA Shutlbrak Switches can be used as single operating switches or assembled into panelboards and switchboards.

- 1 Positive Make and Break
- 2 Silver-Plated Contacts
- 3 Front Operation
- 4 Attractive Finish
- 5 Removable Switch Unit
- 6 Interlocking Fuse Doors
- 7 Kamklamp Fuse Holders
- 8 Full Range of Capacities
- 9 Solderless Pressure Connectors
- 10 Ample Wiring Space and Knockouts
- 11 Approved By Underwriters' Laboratories
- 12 Versatility: Individual or Panelboard and Switchboard Assemblies

Whatever the reason, the fact remains that FA Shutlbrak Switches embody the latest in design and construction, making them the popular choice for high quality, heavy duty switching. So the next time you need a good operating switch, ask your dealer to show you an FA Shutlbrak or send for our 20-page Bulletin No. 70.

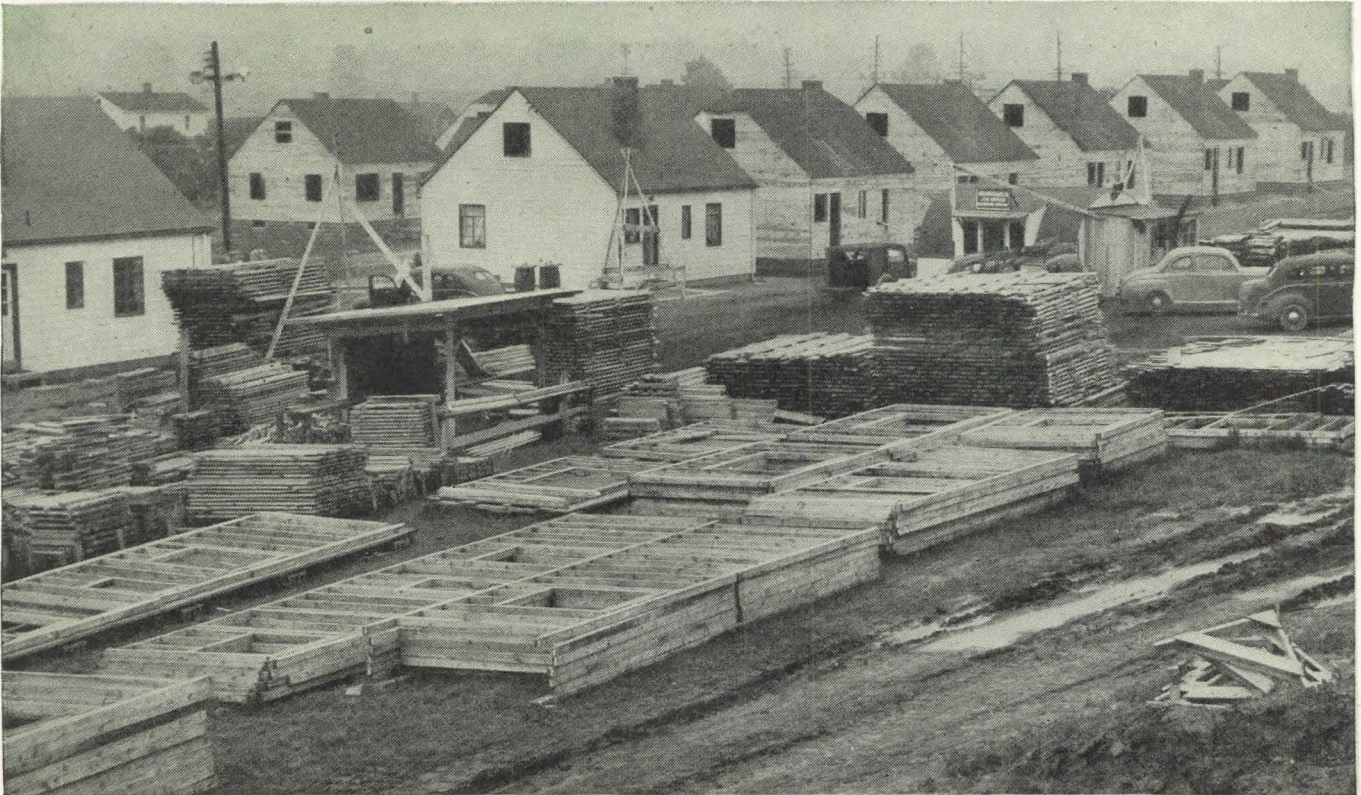
If it's FA it's "OK"

MAKERS OF . . .
BUSDUCT
PANELBOARDS
SWITCHBOARDS

Frank Adam
ELECTRIC COMPANY
St. Louis, Missouri

SERVICE EQUIPMENT
SAFETY SWITCHES
LOAD CENTERS
ELECTRIC QUIKHETER

“Don't tell us it can't be

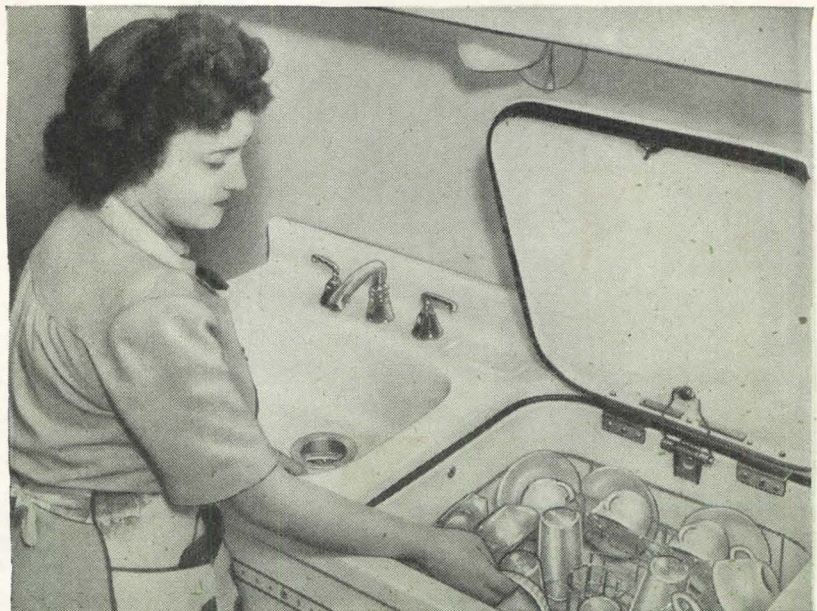


● Masontown, Pa., site of 110 homes being built under the direction of the George C. Brown Co. of Pittsburgh. Architect,

William C. Young, Contractor, Mellon-Stuart. This is the first in a series of the George C. Brown Company developments.



G-E EQUIPPED HOMES



● New owners are enthusiastic about better living, electrically. Mrs. E. C. Detisch, of 18 Cumberland Ave., Masontown, Pa., is especially proud of her G-E Dishwasher and Disposall. But, like other Masontown homemakers, she has found that *all* her G-E appliances — Range, Refrigerator, Steel Cabinets, Washer, and Water Heater — help make housework easier, living pleasanter, in her new all-electric home.

done — **WE'RE DOING IT!**"

"We're Selling G-E Equipped Homes For As Little As \$51 to \$53 a month," Says the George C. Brown Company of Pittsburgh.

Here's what George C. Brown, president, has to say about his company's postwar homes at Masontown, Pa.

"These homes are the first fulfillment in this region of the ease and convenience which housewives have been promised since before the war.

"Standard equipment in every home includes the *all-electric kitchen* with G-E Range, Refrigerator, Steel Cabinets, Dishwasher, and Disposall,* as well as a G-E Washer and Water Heater.

"But most important is the fact that these homes with G-E equipment cost the owner *only* about \$3.00 a month more than the same homes would cost without *any* equipment.

"So don't tell us it's impossible to include the best electric

appliances in new homes, and still keep the cost down . . . we're doing it!"

In Pittsburgh, Denver, Kansas City, St. Louis—all across the country, architects and builders are planning new homes, *designed for better living, electrically!*

From a cost angle: they know it doesn't cost them a dime extra to include all the dependable G-E Appliances. And that there's only a minor increase in cost to the buyer, usually less than \$3.00 a month on his mortgage payments.

From a sales angle: they know that today's homeowner wants, and expects, a completely equipped, up-to-date home; that a home with no *extras* to buy is always a fast seller.

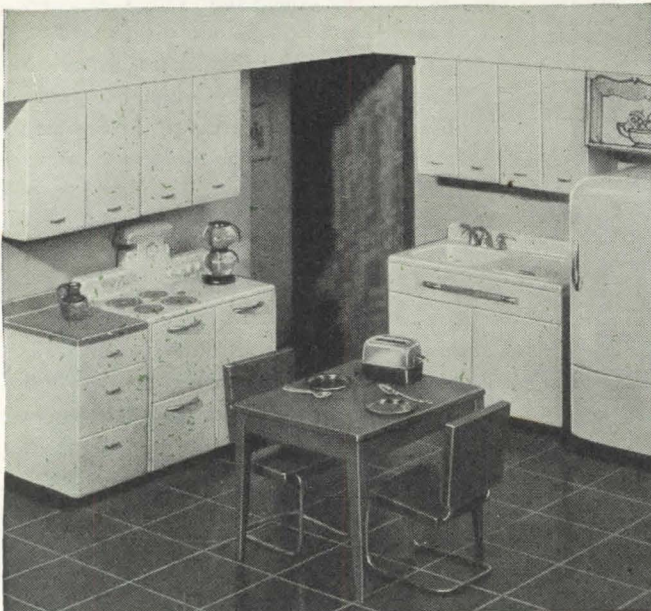
From a quality angle: they know that selling complete, all-electric homes will bring them a reputation as *good builders*—and a good reputation is going to be mighty important as competition gets stiffer.

Most women want G. E.

In planning *your* new homes, keep this in mind too: *recent national surveys showed that 53 per cent of all women prefer G. E. to any other appliances!*

This preference, and the record of G-E appliances for *dependable performance*, are good reasons why so many builders and architects are specifying G-E appliances as standard equipment.

Let us help you plan your 1947 program. For complete information on all-electric homes, with special emphasis on the kitchen and laundry, write to G-E Home Bureau, General Electric Company, Bridgeport 2, Conn.



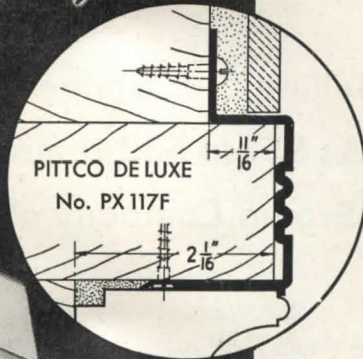
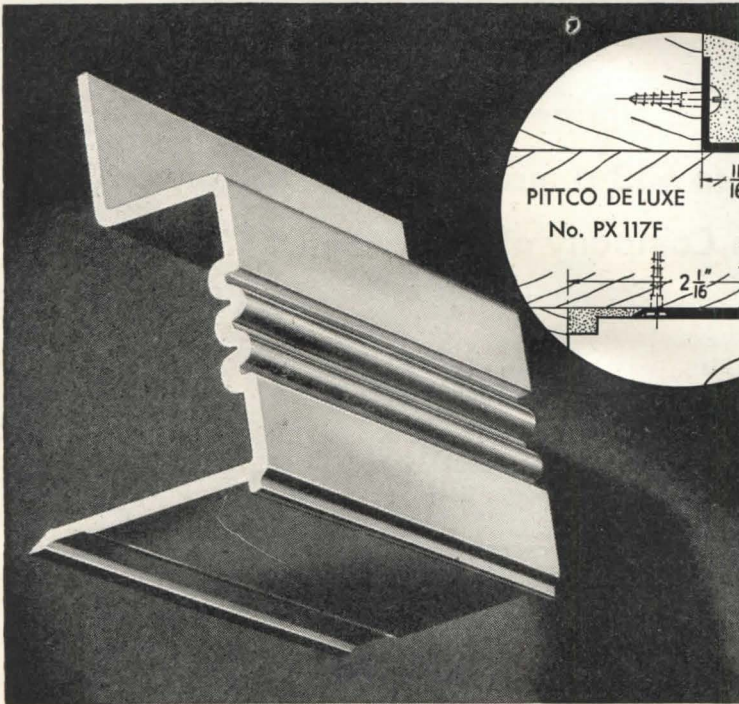
It can cost less to live better in these new homes, financed by the Housing Mortgage Corporation of Pittsburgh. Inclusion of G-E equipment in the mortgage makes only a minor difference in the initial cost. Economical operation and maintenance, and the long life of G-E appliances, more than offset the slight increase in monthly payments.

THE APPLIANCES MOST WOMEN WANT MOST

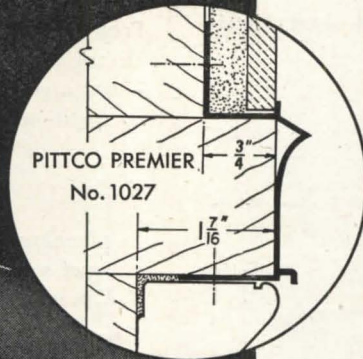
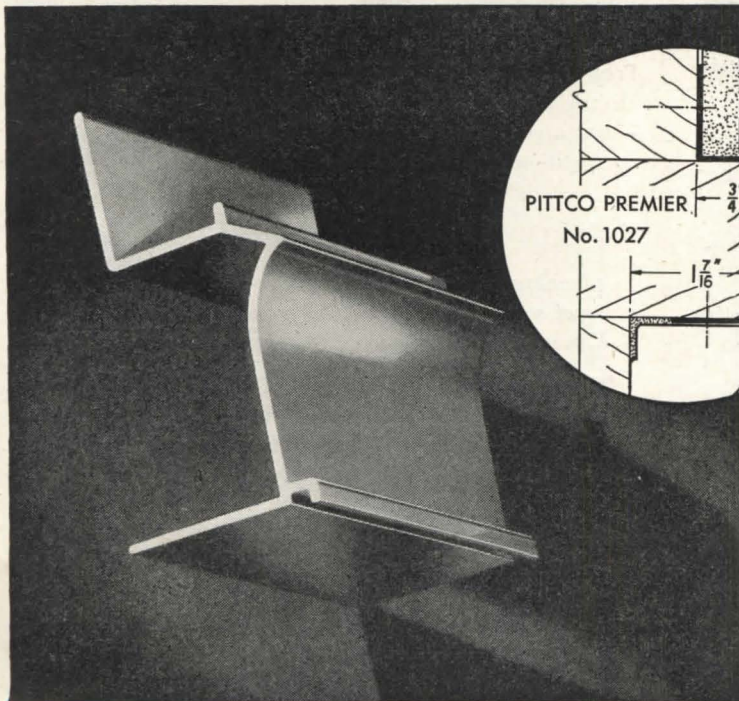
GENERAL  ELECTRIC

*Trade-Mark Reg. U. S. Pat. Off.

Two lines of PITTCO METAL with the same rich finish



PITTCO DE LUXE Pittco DeLuxe Store Front Metal has a satin-smooth finish, rich in tone and gloss, which has delighted both architects and store owners. They like it because it harmonizes perfectly with any material or color combination. And the Pittco De Luxe line also has rugged, sturdy strength and clear, sharp profiles assured by its extruded method of manufacture. Imaginative styling and the wide variety of bars, mouldings and sash in the De Luxe line permit the architect many effective combinations. For symmetry, strength and perfect finish, Pittco De Luxe is the ideal choice for impressive, distinctive store fronts of high quality.



PITTCO PREMIER Pittco Premier, although lighter in weight and more moderately priced than Pittco De Luxe, has the same rich, smooth finish. And into the Premier line, too, has gone the same careful planning which has made the De Luxe line so popular. All Premier members were styled at one time so that perfect harmony would be inherent in the line . . . each Premier unit complementing the beauty of other pieces used with it. Pittco Premier construction can be set quickly and easily . . . a simple outside procedure that effects a substantial savings in setting time. In Pittco Premier architects will find a lightweight, economical metal with which to create pleasing, appealing store fronts.

PITTCO STORE FRONT METAL

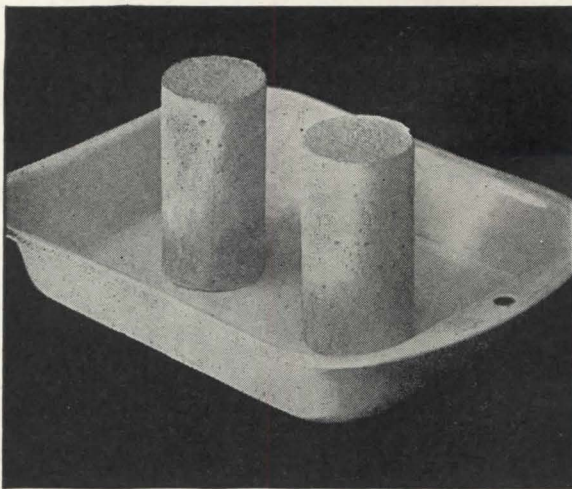


"PITTSBURGH" stands for Quality Glass and Paint

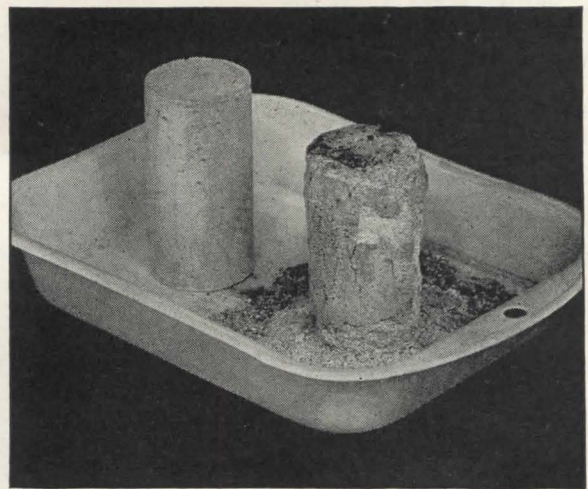
PITTSBURGH PLATE GLASS COMPANY

BRIXMENT MORTAR

Is More Durable



To compare the durability of two mortars, make a cylinder or block of each, let them "cure" for a month or so, then freeze and thaw them forty or



fifty times, with a little water in the pan (the freezing unit of your electric refrigerator will do). Try this with Brixment mortar!

—AND DURABILITY MEANS PERMANENT STRENGTH AND BEAUTY

For permanent strength and beauty, mortar must be *durable*—must be able to withstand the alternate freezing and thawing to which it is subjected many times each winter.

Brixment mortar *is more durable*. This greater durability is due partly to the strength and soundness of Brixment mortar, and partly to the fact that Brixment is waterproofed during man-

ufacture. This waterproofing helps prevent the mortar from becoming saturated—therefore protects it from the destructive action of freezing and thawing.

Walls built with Brixment mortar therefore *retain* their original strength and appearance. . . . Even in parapet walls and chimneys, where exposure is particularly severe, Brixment mortar will almost never require repointing.

LOUISVILLE CEMENT CO., Incorporated, LOUISVILLE 2, KENTUCKY

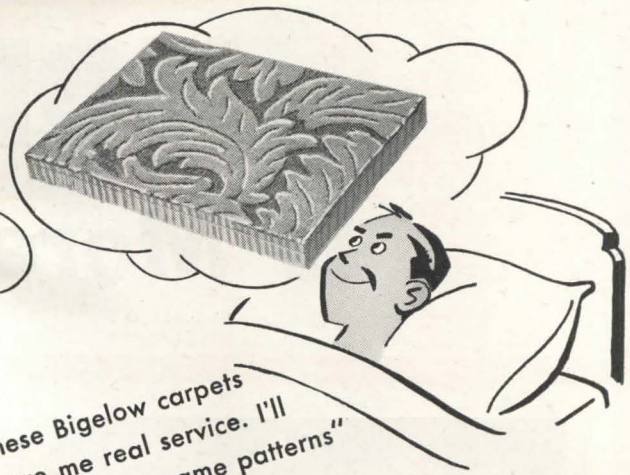
CEMENT MANUFACTURERS SINCE 1830

About those **NEW** carpets . . .

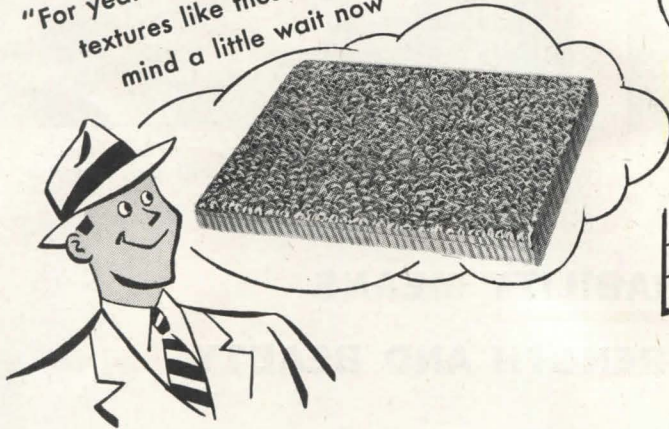
"I've decided on Hartford Saxony for this lobby . . . and I'll sure wait for that"



"These Bigelow carpets gave me real service. I'll stick to the same patterns"



"For years I've wanted rich, new textures like these . . . so I won't mind a little wait now"



"I can save both installation and maintenance waste with Bigelow Lokweave. That's what I want"

...It's worthwhile waiting

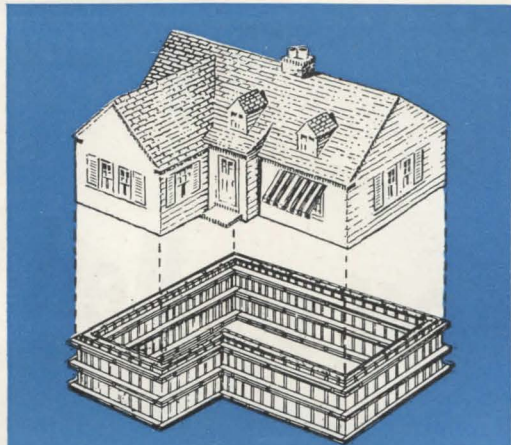
Bigelow carpet production is getting back to normal . . . and orders will be filled. Now's the time to plan redecorations. Ask your dealer about Bigelow's Carpet Counsel. It's an old, free service to save you time and money.

BIGELOW-SANFORD CARPET CO., INC.

140 Madison Avenue • New York 16 • N. Y.

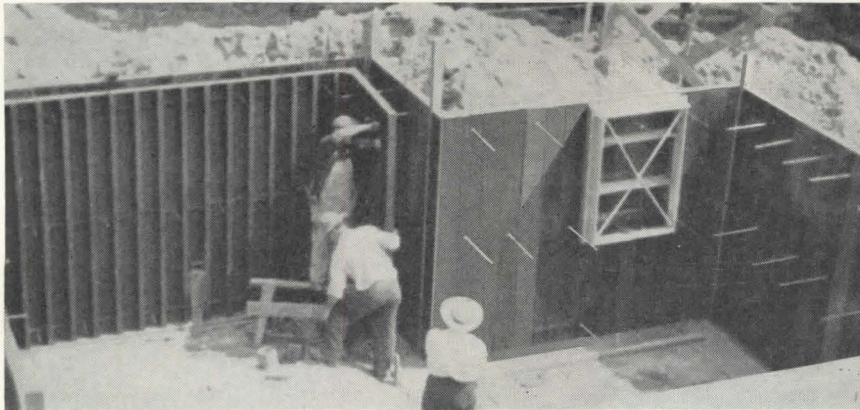


A Poured Concrete Foundation Complete in ONE Day



ATLAS LABOR-SAVING *SPEED* FORMS

For Rent or Sale



Typical corner detail ATLAS SPEED FORMS

Easy to set up, strip and move. Light weight, averaging only 35 lbs. per unit. Inserts easily and accurately accommodated. Strong—No studs or joists required as with wood forms. Durable—can be used over and over indefinitely. Leave a smooth uniform finish—No Grain Marks—Nothing to Remove.

Everyone wants a house with a sound foundation and dry cellar.

Some New Users

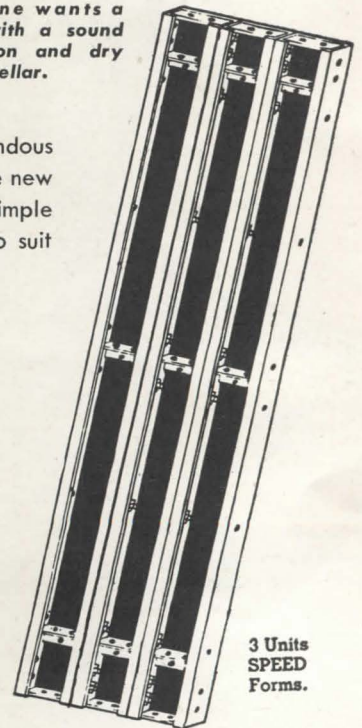
- THE TYLER CORP., Falls Church, Va. Housing Project. Churchill Fulmer Assoc., N. Y. C., Architect.
- PROGAR BLDERS, INC., Radburn, N. J. Housing Project. Fred J. Roughgarden, Hawthorne, N. J., Architect.
- WORSHAM BROS., Knoxville, Tenn. Housing Project.
- LOUIS BELLI, INC., Flushing, L. I. Housing Project.
- SANDERSON & PORTER, Frankfort, Ky. National Distillers Bldg.
- A. FRIEDERICH & SONS, Rochester, N. Y. Gen. Railway Sig. Co. H. L. Stone & J. G. Shea, Architects.
- H. K. FERGUSON ENG. CO., Cleveland, Ohio. Sherwin Williams Plant, Cleveland, Ohio. Homer T. Borton, Architect.
- A. J. GLASER, MUNCIE, INC. Saginaw Malleable Iron Works, Danville, Ill. General Motors Corp., Architect.

A HOUSE FOUNDATION a day at a tremendous saving in cost is easy with Atlas SPEED Forms—the new process for concrete construction which makes it simple to strip, move and set up form work accurately to suit any building condition.

In heavy construction, too, contractors are amazed at the savings they make and order again and again. Savings of 25% and more are not unusual in apartment house, department store, factory and water work construction. Ask any of the users and find out first-hand.

Economical to Rent or Buy—Available for Early Delivery.

Write for Illustrated Folder No. 6



3 Units
SPEED
Forms.

Irvington Form & Tank Corporation

Irvington 16, New York

Atlas Steel Forms for every Purpose

then he said to himself:

“OK spelled backward is KO”

THE hero of Yugoslav resistance, the late Draža Mihailovich, at the end of a three-day questioning, finally said:

“I wish you wouldn’t torture me with rhetoric. When I am too tired, I say yes.”

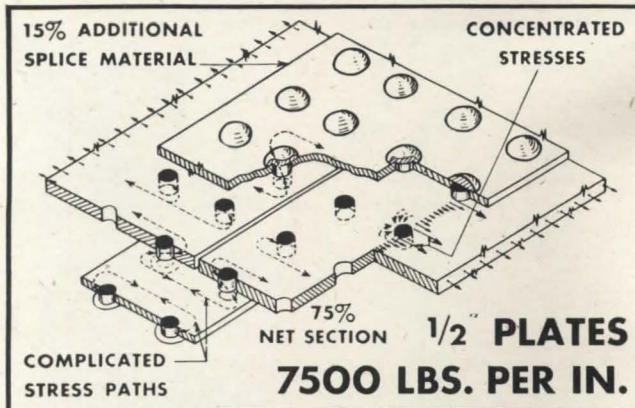
Far too many people are prone to dismiss a moot subject with a tired “Yes” . . . meaning they haven’t the energy to explore for *facts* on which to base a gainful YES or NO . . . when it is so simple to do it this way . . .





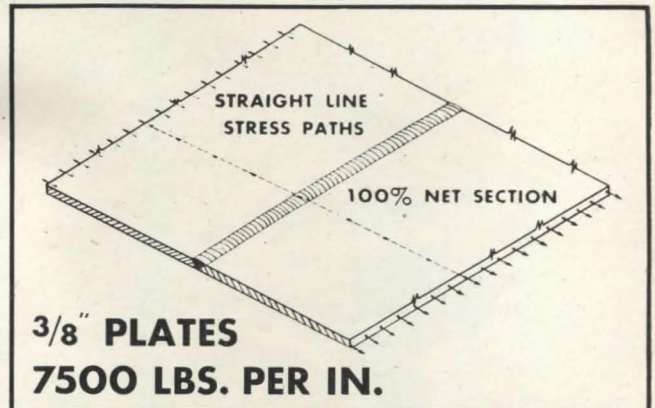
Apply Draja's reasoning to the choice between two methods of joining metal members . . . plates for example:

Which would you *OK?*



THE RIVETED JOINT

- Develops 7500 lbs./in.
- Requires 1/2 inch plates
- Requires 15% additional splice weight
- Requires accurate detailing of 4 plates
- Requires accurate punching of 4 plates
- Requires 2 to 4 men to buck up and rivet



THE WELDED JOINT

- Develops 7500 lbs./in.
- Requires 3/8 inch plates
- Requires no additional splice weight
- Requires no detailing
- Requires no plate preparation
- Requires 1 man to arc weld

The Lincoln Engineer nearby will gladly help you explore further facts on the two methods as applied to your specific problems.

Studies in Structural Arc Welding free to architects and engineers.

THE LINCOLN ELECTRIC COMPANY • DEPT. 323 • CLEVELAND 1, OHIO

America's greatest natural recourse

ARC WELDING

What keeps the rhino feeling right can keep your clients happy, too!



Life is rugged for the Rhino, but he never seems to mind. Why should he worry? He knows his *armored wearing surface* will protect him from his natural enemies.

The Barrett Specification* Roof, with its armored wearing surface of gravel or slag, provides equally sturdy protection for buildings. It's so long-wearing it can be bonded against repair and maintenance expense for as long as 20 years.

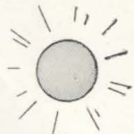
Built up of alternate layers of coal-tar pitch and felt, topped by a thick pouring of pitch to *anchor* the gravel or slag wearing surface, it is the toughest, longest-lasting built-up roof made. It is waterproof, fire-safe, sun resistant, and armored against mechanical damage.

As a service to your clients, recommend Barrett Specification Roofs on the buildings you design. The Atomic Bomb Plant at Oak Ridge, Tennessee, the Empire State and R. C. A. buildings in New York, and many other famous American buildings—all Barrett-roofed—will bear out the soundness of your recommendation.

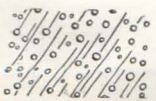
Over 90 years of successful roofing experience has demonstrated the sound value of the gravel or slag wearing surface of a Barrett Specification Roof:



1. It holds in place the heavy poured (not mopped) top coat of coal-tar pitch—providing a doubly thick waterproof covering.



2. It provides protection against the sun's actinic rays which otherwise dry out the valuable oils in roofing bitumens.



3. It protects the roof against mechanical damage, hail and wind, wear and tear.



4. It interposes a surface of fireproof rock between the building and flying embers—makes a roof that carries Fire Underwriters' Class A Rating.



* Reg. U. S. Pat. Off.

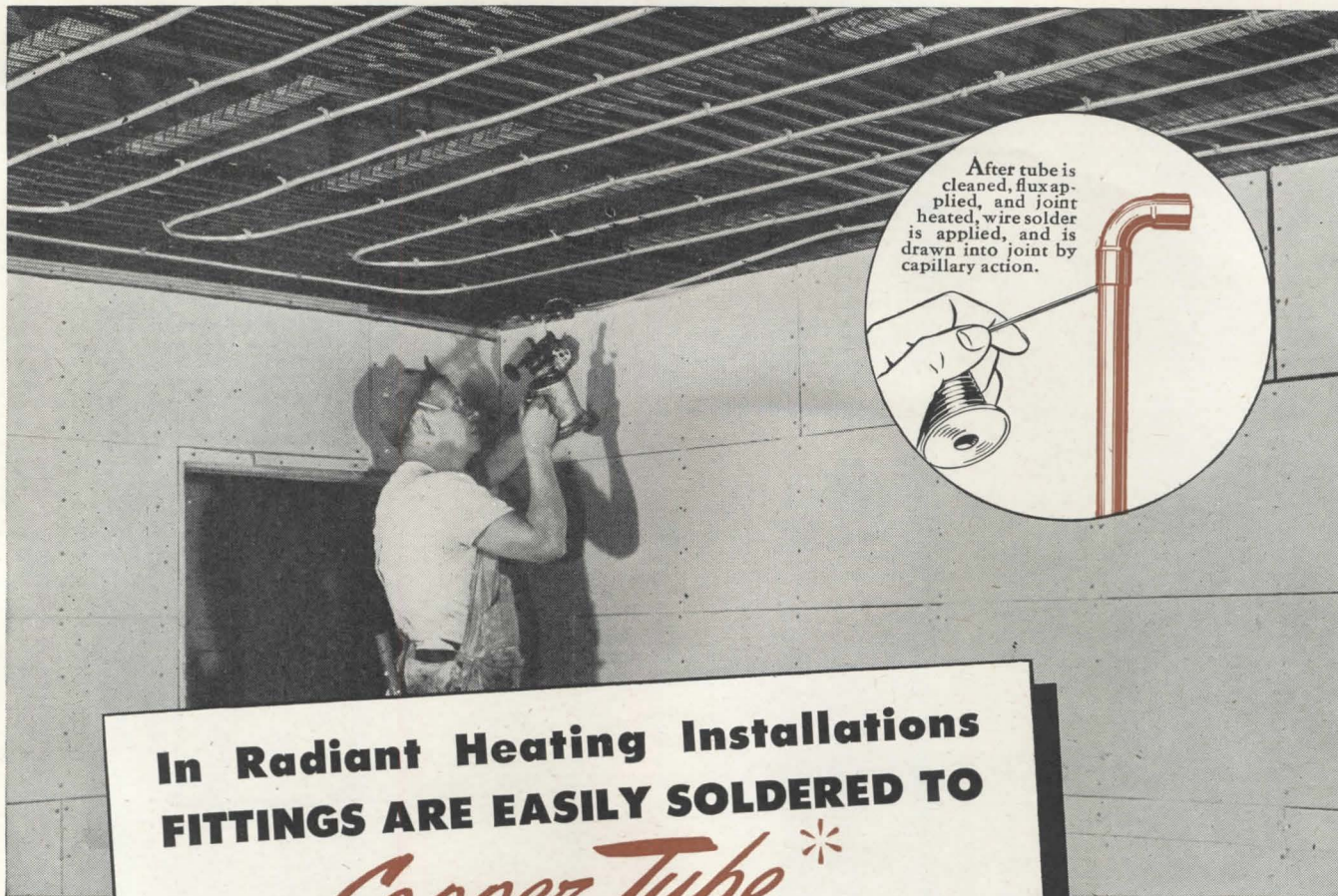
THE BARRETT DIVISION

Allied Chemical & Dye Corporation

40 Rector Street, New York 6, N. Y.

2800 So. Sacramento Ave. Birmingham
Chicago 23, Ill. Alabama

In Canada: The Barrett Company, Ltd.,
5551 St. Hubert Street, Montreal, Que.



**In Radiant Heating Installations
FITTINGS ARE EASILY SOLDERED TO**
Copper Tube *

WHEN Chase Copper Tube is used in radiant heating installations, tight joints are easily made by a simple soldering operation. Both Chase Copper Tube and Chase Solder-type Fittings are made to close tolerances that help assure proper filling of the joint with solder.

Even these easily made joints are needed in only small numbers. Chase Copper Tube comes in lengths up to 100 feet—fewer joints needed between coils. It's

easily bent to shape right on the job—no fittings needed at bends. No special tools required for bending, either.

With these and other advantages of Chase Copper Tube (note list at right) it's not surprising that we cannot always keep pace with the demand. But if you're planning radiant heating installations, the information is available for your use right now. We'll be glad to send you our radiant heating literature—simply address Dept. AR106.

**7 Reasons
WHY CHASE COPPER TUBE
FOR RADIANT HEATING**

1. EASY TO BEND
2. LIGHT IN WEIGHT
- * 3. SOLDERED FITTINGS
4. SMALL DIAMETERS
5. LONG LENGTHS
6. LOW COST
7. LONG LIFE



Chase
BRASS & COPPER CO.

Waterbury 91, Connecticut
SUBSIDIARY OF KENECOTT COPPER CORPORATION

This is the Chase Network—handiest way to buy brass

INCORPORATED

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Like Frozen Music . . .

• No beauty in Chopin 'til a Rachmaninoff or a Kilenyi pulls it from a Steinway. No beauty in tracings 'til they turn to stone in the architecture Von Schelling calls "frozen music."

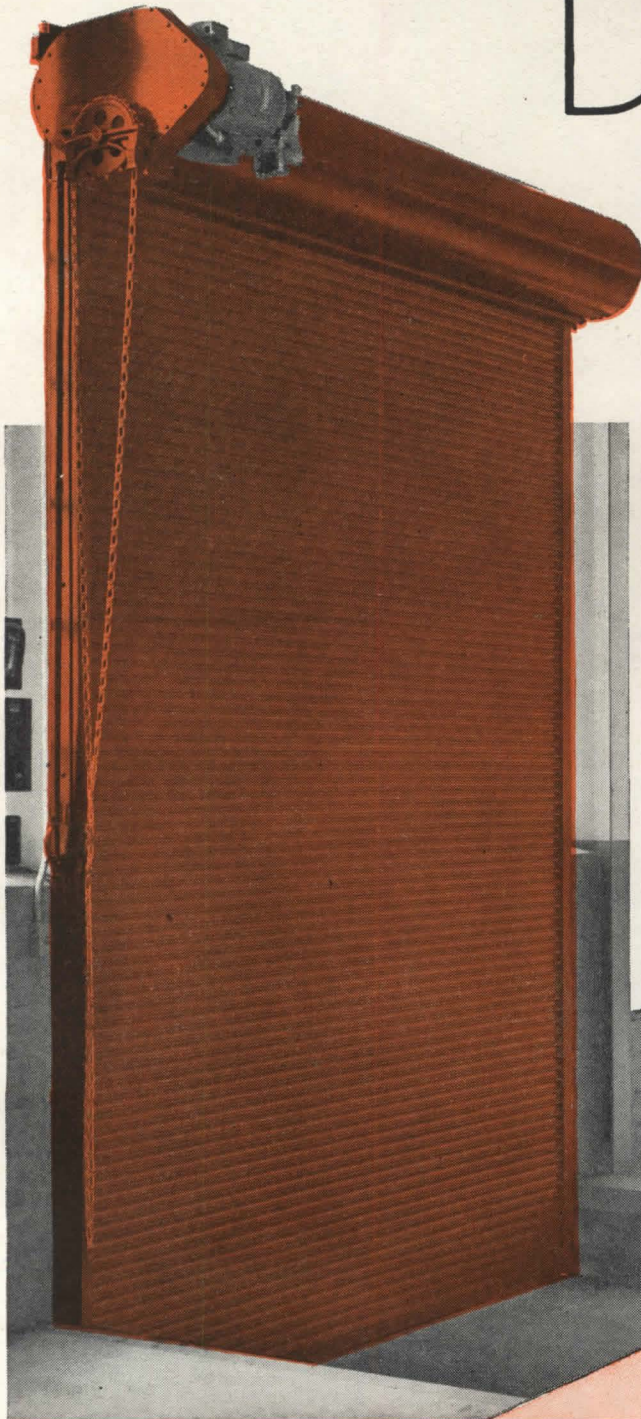
Indiana Limestone is America's *most frequently specified* stone not only because of its incomparable beauty, moderate cost and constant availability direct from our companies, ready for positioning . . . but because it resists temperature extremes, and assures *homogeneous* strength regardless of natural bed plane.

If your questions are unanswered by our Sweet's File catalog, experts in our Technical Division, backed by a century's experience in every building application, will counsel with you personally.

INDIANA LIMESTONE INSTITUTE
P. O. BOX 471 • BEDFORD, INDIANA

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Rolling Steel DOORS



Manual • Mechanical • Power Operation

In Mahon Rolling Steel Doors, Grilles and Shutters you get the ultimate in modern design, materials and workmanship. The Mahon Standard Power Operator in particular offers advantages in operation and in compactness of design which are not available to you elsewhere. You will find also that there is a Mahon Rolling Steel Door, Grille or Shutter to meet perfectly every commercial or industrial requirement. See Mahon Insert in Sweet's, or consult a Mahon Engineer.

THE R. C. MAHON COMPANY
 Detroit 11, Michigan • Western Sales Division, Chicago 4, Illinois

Representatives in All Principal Cities

Manufacturers of Rolling Steel Doors, Shutters and Grilles, and Mahon Steel Deck for Roofs, Sidewalls, Partitions, Acoustical Ceilings, Permanent Floor Forms and Oversize Doors.



NEW CATALOG NOW AVAILABLE
 Complete Catalog, containing Installation Details and Clearance Dimensions, will be mailed upon request.

ROLLING STEEL DOORS, SHUTTERS AND GRILLES TO MEET EVERY REQUIREMENT

One of Many Mahon Power Operated Rolling Steel Doors Installed in the New Plant of The Falls Spring & Wire Company, Detroit, Mich.

MAHON

Since 1890



Good people to do business with." That is a statement often made about Spencer. It's the best compliment we could ask for—and we promise to live up to it.

Spencer *knows* the heating business. Through the years our engineers have progressively modernized the Spencer line. Today's modern Spencer steel boiler is not just "another package" but a time-tested, *proven* product . . . a good reason why men who "live" heating problems recommend Spencer . . . why many of the most reliable distributors in the industry sell Spencer.

There's a precision-built Spencer unit for every individual heating job . . . every type of heat . . . every size of building . . . a premium boiler at no additional cost. Write or wire for a catalog of the complete Spencer line *now*.

SPENCER HEATER

Division—The Aviation Corp., Dept. A-8, Williamsport, Penn.



54%=2H

that's real precision grading



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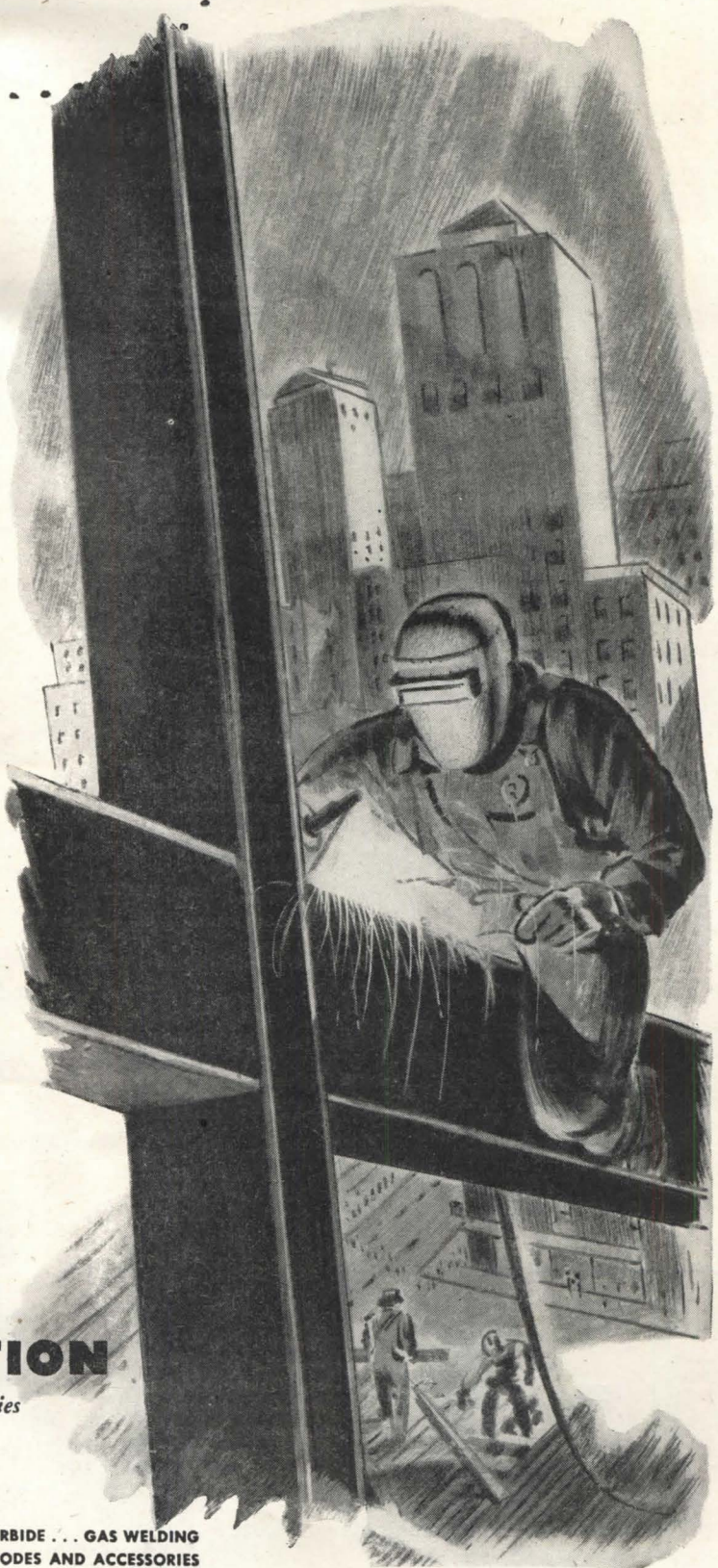
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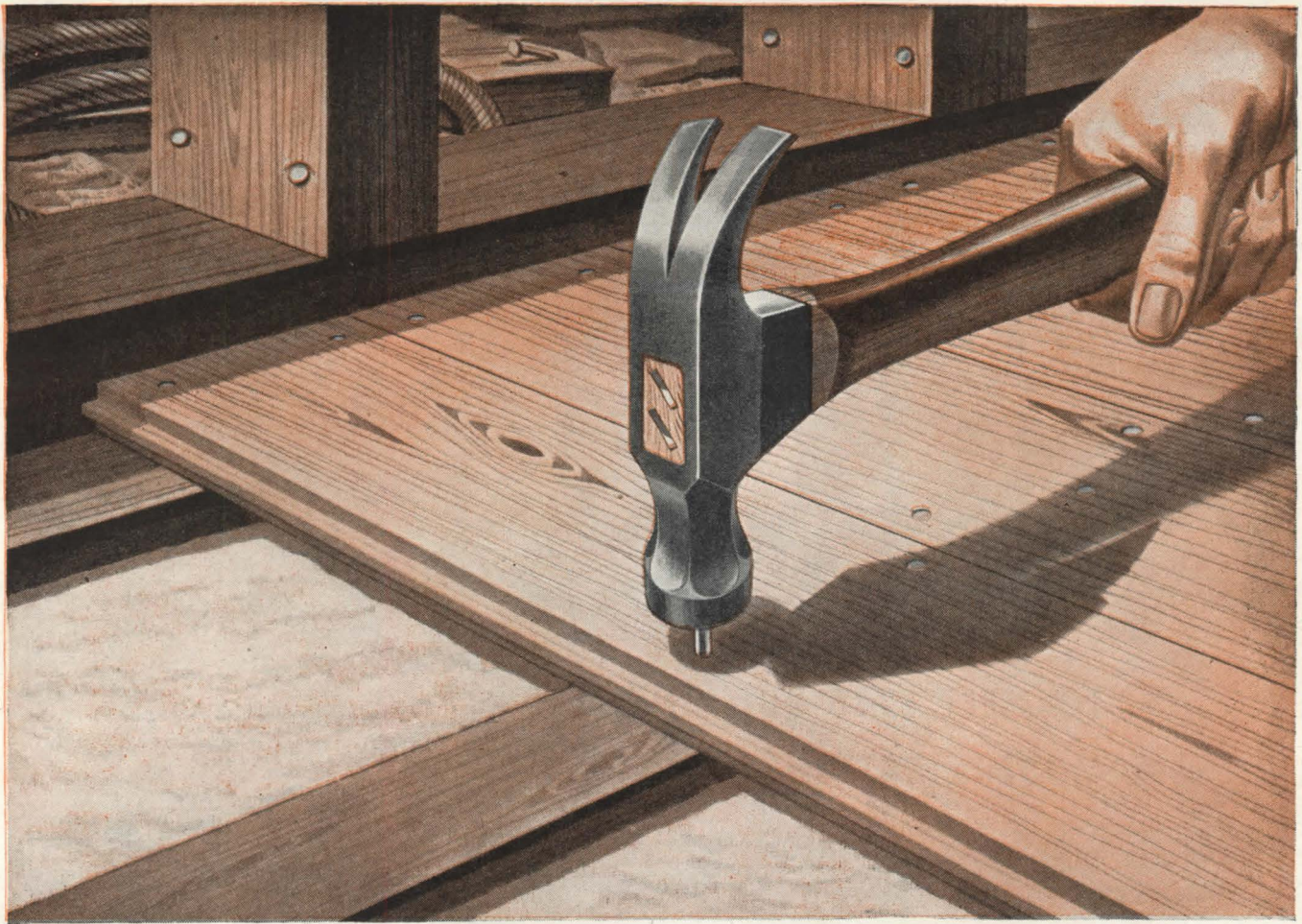
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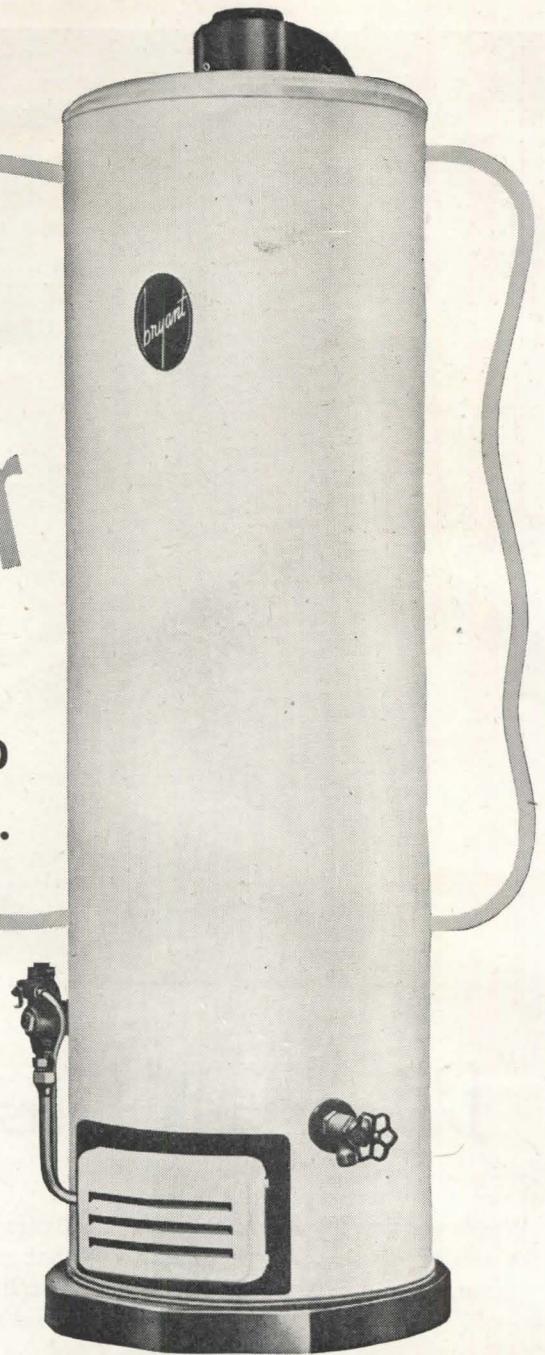
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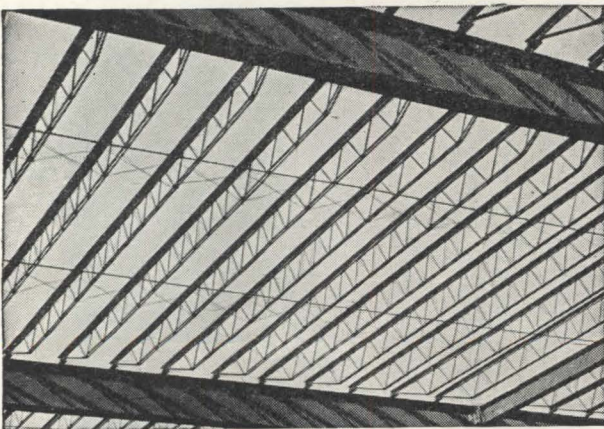
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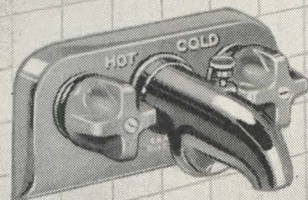
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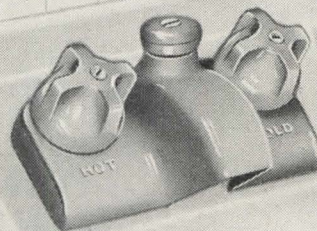
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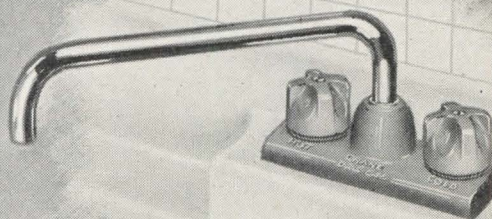
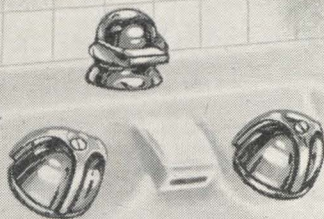
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LINKED closely to the precision jobs coming off the boards are the tools that assure accuracy of detail. One of these is the seemingly small pencil which looms large in the mind of a craftsman, as an important instrument of accuracy.

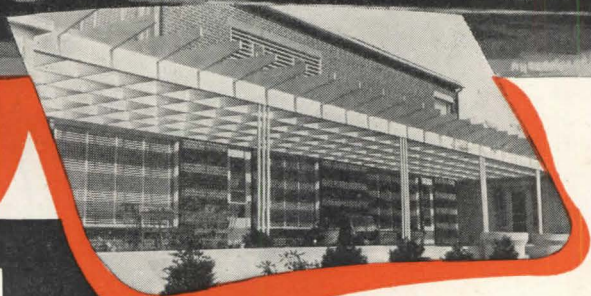
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Front and rear views of one of the 400 distinctive homes planned for "Knollwood" and "Salisbury Heights" development in Worcester, Massachusetts.

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COMMUNITY DEVELOPMENT

One of the country's ultra-modern postwar community projects has been designed by Ames Aksila, Worcester, Mass., Developer and Builder. Unusual features include ceiling panel heating of all first floor rooms. And each of the 400 homes will be equipped with a Moduflow control system, which is Minneapolis-Honeywell's latest contribution to heating comfort and efficiency.

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But, regardless of any project's size, whether a single home, or 400, when Moduflow is specified your clients are assured of a new high standard of house heating comfort. Moduflow control systems are now available and their performance record has already been established in thousands of homes throughout the nation. Minneapolis-Honeywell Regulator Company, 2600 Fourth Avenue South, Minneapolis 8, Minnesota.

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MORE INSPIRED CHURCHES

WE SHOULD have no illusions about the difficulties of designing a soul-satisfying church. True, it may not be too hard to please a dominie, or his flock, or even the building committee. The pastor may be satisfied if his pulpit is well placed and the acoustics are good; the congregation will probably like the edifice because it is bright-and-shiny new and less draughty than the old; the building committee will like it because they can show that here or there they saved a dollar or two. But to create a church design that is really inspiring, expressive of spiritual aspiration, that lifts one's mind and soul, that creates a worshipful mood — as well as being physically efficient and enduring — is no mean task.

It is a task worthy of the best efforts of the most sensitive and talented members of the profession, one that should be welcomed rather than shunned because of its difficulty. For it does take the highest form of creative imagination — inspiration, if you please. And it takes the utmost of the designers' powers of persuasion, diplomacy, and applied psychology as well. The intrinsic difficulty of the esthetic problem is complicated by the problem of human relationships, the necessity of dealing convincingly with church building committees.

What makes the architect's task the harder is that the church building committee is usually sincere, devoted, well-intentioned and hardworking, however dogmatic, opinionated, parsimonious and "practical" they may turn out to be. Fortunate indeed is the architect who finds a church building committee open-minded, sympathetic, sensitive to the nuances of good design, appreciative of scale, proportion, form, color, texture.

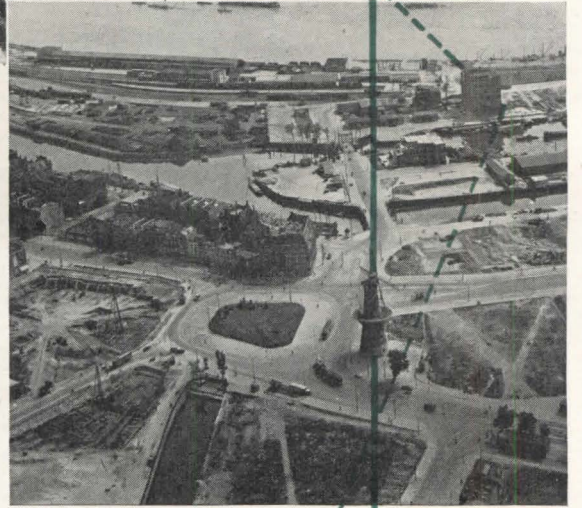
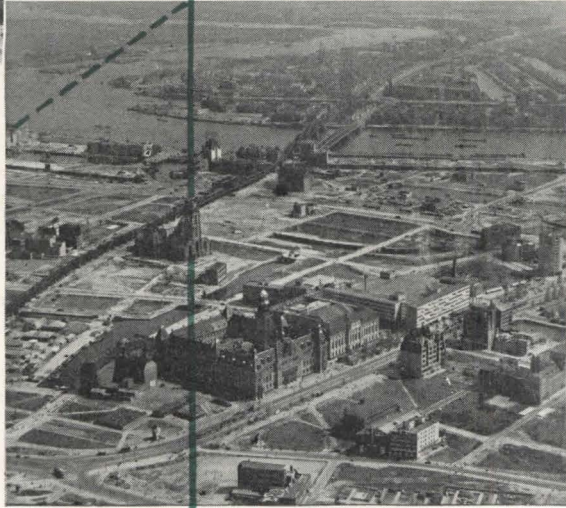
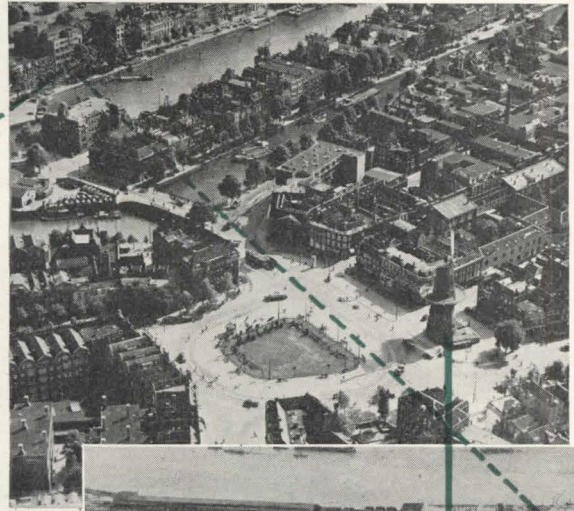
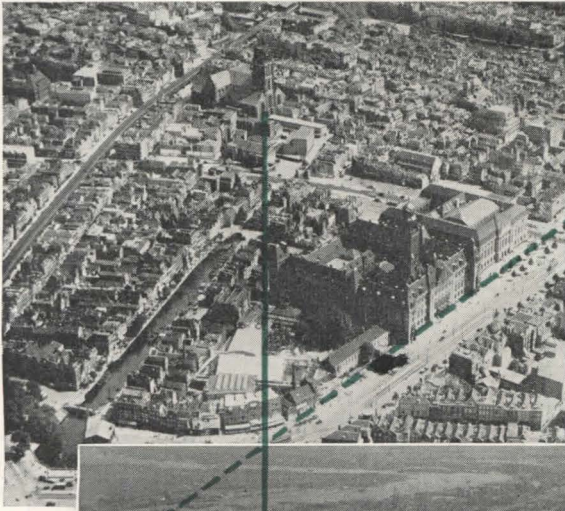
A building committee pre-informed of architectural practice and progress, and predisposed to give the architect the fullest scope for his creative imagination would be a boon conducive to inspired churches. An architectural handbook for the churchman would serve a mighty useful purpose, save many a frustration.

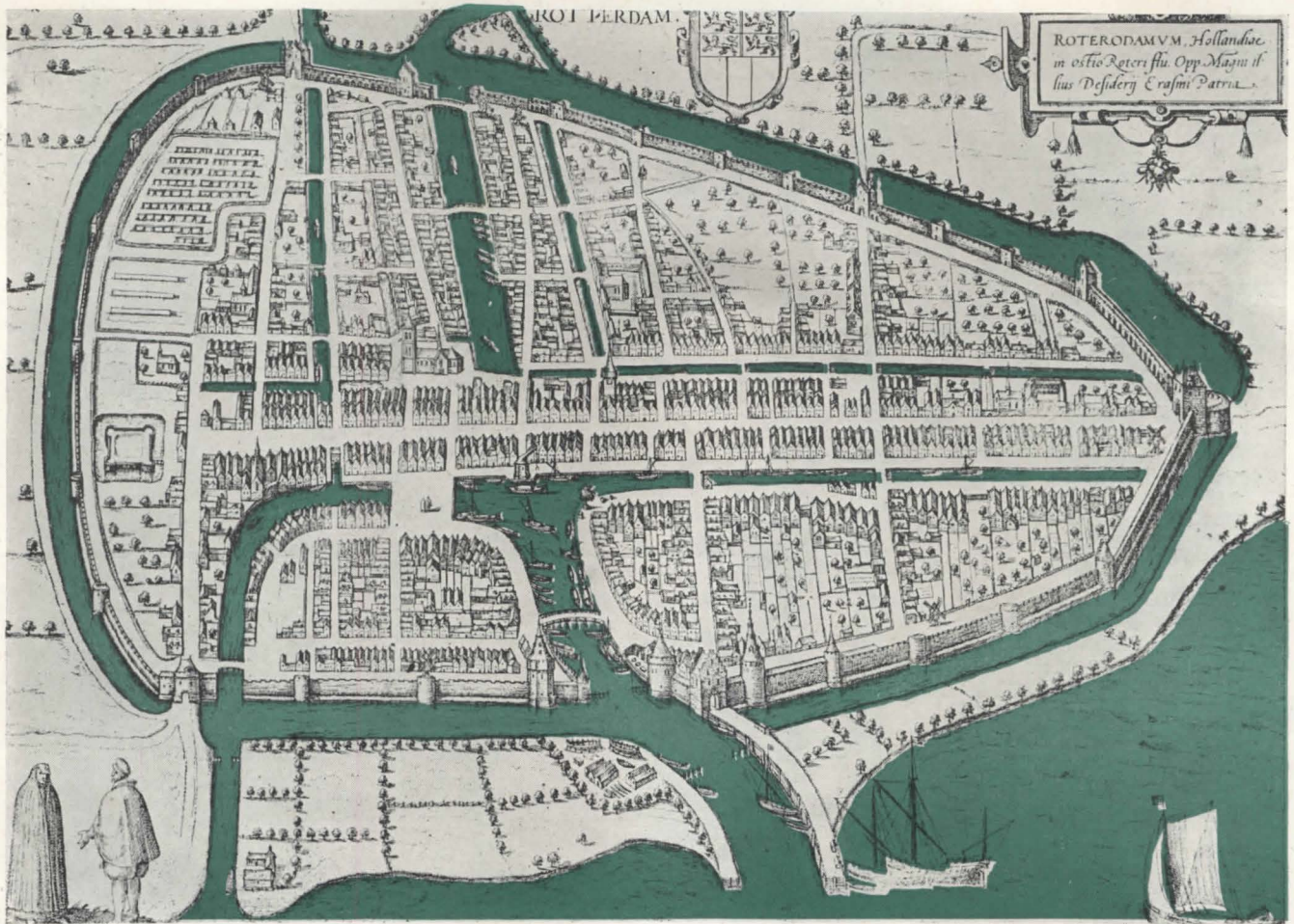
But I do believe that an architect, if he has the will and the inspiration, the patience and the tact, can create, even with a modest budget, a church worthy of its function. However, it seems too few of our most talented designers have devoted their efforts to this most difficult of all forms of architectural expression. Their minds and hands have been otherwise engaged in serving society in more exciting, more lucrative and less circumscribed fields. If our major architectural achievements are in the realm of commerce or industry, recreation or health it is because society's interests, emphasis and emoluments are centered there. For architecture is inevitably an expression of the civilization of the time and place of its creation.

Here and now we find church attendance and church prosperity at new high levels. Hundreds of churches are thus encouraged to wish and to work for new edifices. Architects' plans and sketches are being used as major tools in the fund-raising drives. Today architects are confronted with a greater opportunity for their talents than ever before — the opportunity to design inspired churches, churches as distinguished in the quality of their design as in the quality of their materials and equipment, churches worthy of their functions, spiritual as well as physical.

Kenneth K. Stowell

EDITOR





A PLAN FOR ROTTERDAM

By Earle Draper, Jr.

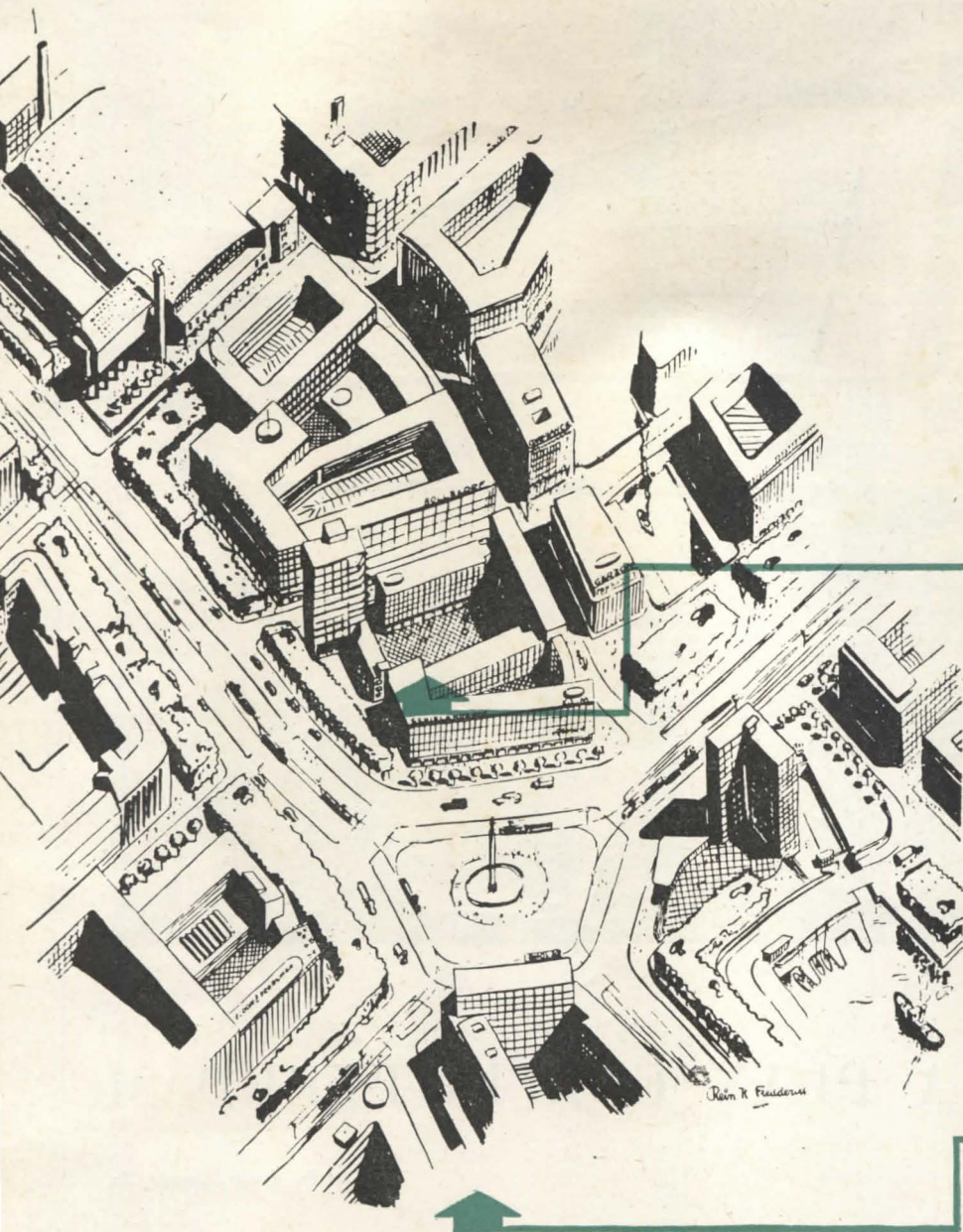
ROTTERDAM has been working for six years on its new city plan. One of the earlier cities to be largely leveled by bombs, Rotterdam immediately started to replan its future, and, in five years of working behind its conquerors' backs, threshed out the innumerable discussions that must attend drastic replanning. Early in 1946 the new plan was ready and accepted, and new construction was going forward according to its dictates.

Standing in the shadow of the modern Bourse, one of the few buildings spared in the destructive German air raid in May, 1940, one can see the reinforced concrete

skeleton of the new Rotterdam Bank Building, and not far west on Coolsingel Street there is a large theater more than half completed. But perhaps the most impressive sight is the large open areas overgrown with grass and weeds. In the past these areas were densely built up and represented the heart of the city. The raid resulted in the loss of 25,000 houses, 2300 shops, 1450 offices, 700 warehouses, 4 railway stations, 24 churches, 60 schools, 500 public houses, 30 factories, and 26 hotels. But there are no ruins left standing to testify to this catastrophe. The industrious Rotterdammers have

The first replanning of Rotterdam (opposite page) was completed three weeks after the bombing that virtually leveled the city. The Dutch industriousness that led them to clean up the rubble as thoroughly as is shown in the photographs (even including the removal of old piers and foundations) took on a note approaching panic when it came to the replanning. For the Ger-

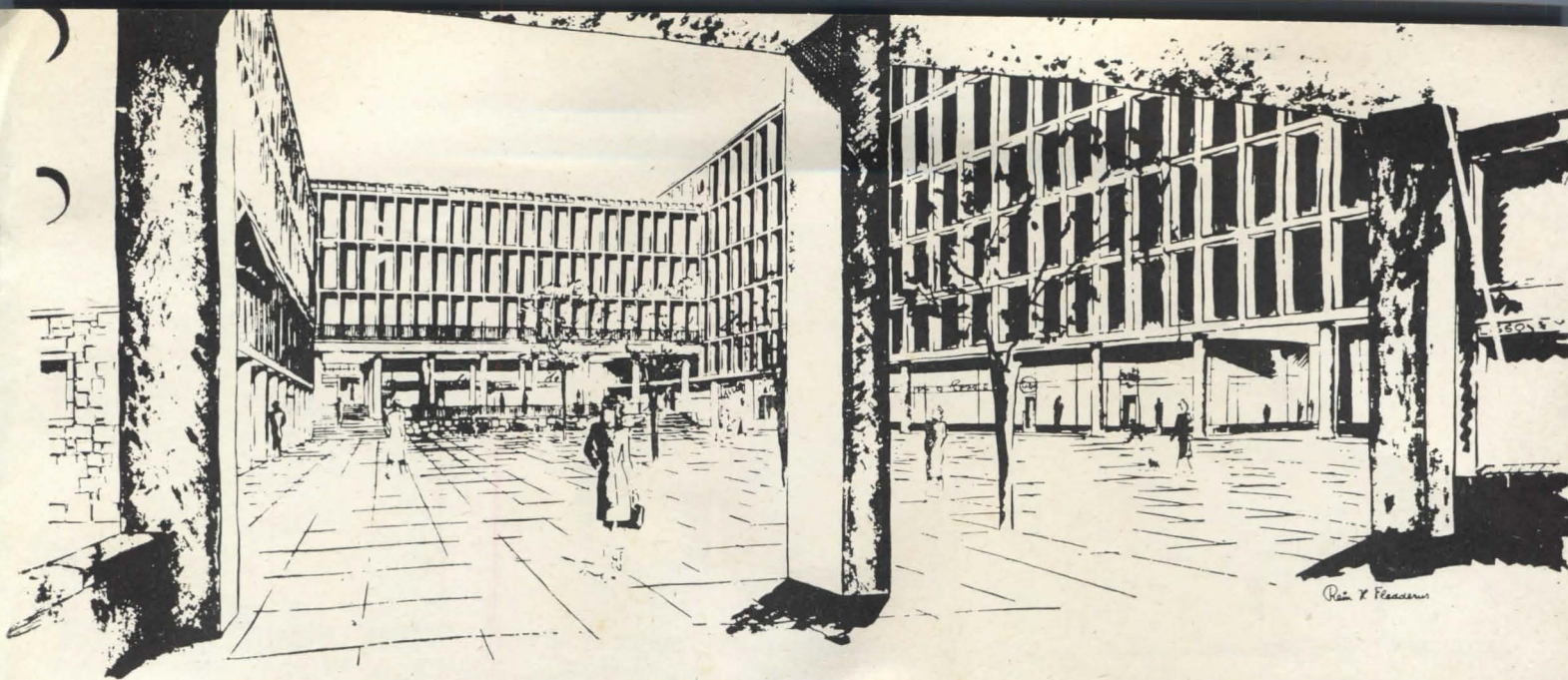
mans were coming, and the Dutch knew that Hitler dabbled in city planning. So this early plan was rushed in the hope that he might accept it. But the Germans were kept busy, and — fortunately, the Dutch now say — the plan was never put to use. Now it has been superseded by a better one (pages 74–75) prepared during five years of Underground activities



cleared away all of the debris, and have even gone so far as to remove all of the foundation piles.

Reconstruction work will not be confined to the destroyed area; construction projects are going forward in various sections of the city. A large 1900-family housing project is well under way across the Maas River in the southern section of the city; construction of buildings for light industry is in progress northeast of the exchange; canal bridges which will be an integral part of the new street system are in evidence.

All of these new projects conform with Rotterdam's new plan. This plan represents five years of underground work. It supersedes the first plan for the rebuilding of Rotterdam, which was the official plan for the rebuilding of the city until 1946. This first plan was completed three weeks after the air raid to prevent German interference. As Mr. van Emden put it, "We knew Hitler dabbled in city planning, and we wanted to have a plan ready before he or his technicians arrived." Fortunately the war prevented work on this plan, for had it been



Replanning for Rotterdam began with the dikes and wharfs of the harbor, for shipping is the life blood of the city's commerce. Besides the maritime center and seamen's quarters, there will be other groups segregated by functions — public buildings near the city hall, which was spared in the bombing, a financial group near the Bourse, a recreation center near the central station, housing groups in greenbelt locations, small-industry groups in the city, larger industries outside of the area shown

carried out there would have been only a slight improvement on the old city plan.

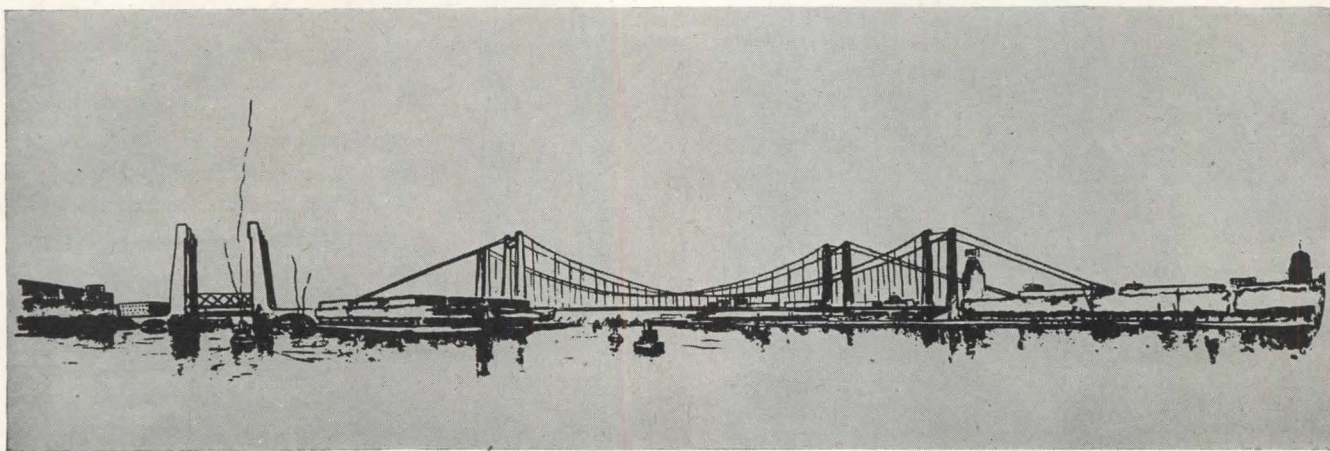
The new plan of Rotterdam, however, represents a real achievement in city planning. The three men largely responsible for the new plan, Cornelius van Tass, director of planning; Samuel van Emden, deputy director of planning; Rein. H. Fledderus, the chief architect, are to be commended not only for their scheme, but also for the manner in which they arrived at this plan. During the occupation all of the work had to be carried on under-

ground, but in spite of this handicap, the people of Rotterdam were not excluded from the work. Representatives from all walks of life were constantly consulted in the preparation of the plan.

The new plan seeks to achieve an orderly grouping of related functions. Public buildings will be grouped in the vicinity of the city hall, another building spared in the bombing attack; banks will be located near the exchange; a recreation quarter with cafés, restaurants, hotels, and theaters is planned close to the proposed



View 1: the Maritime Center, long piers at the left, wharfs and shippers' buildings at the right

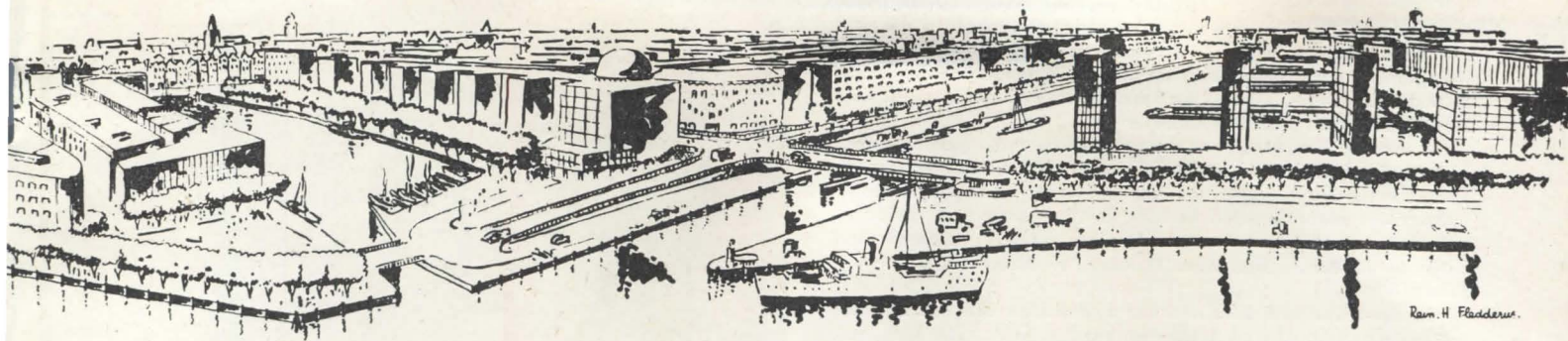


View 2: motor and rail traffic will cross the harbor and the island on two suspension bridges

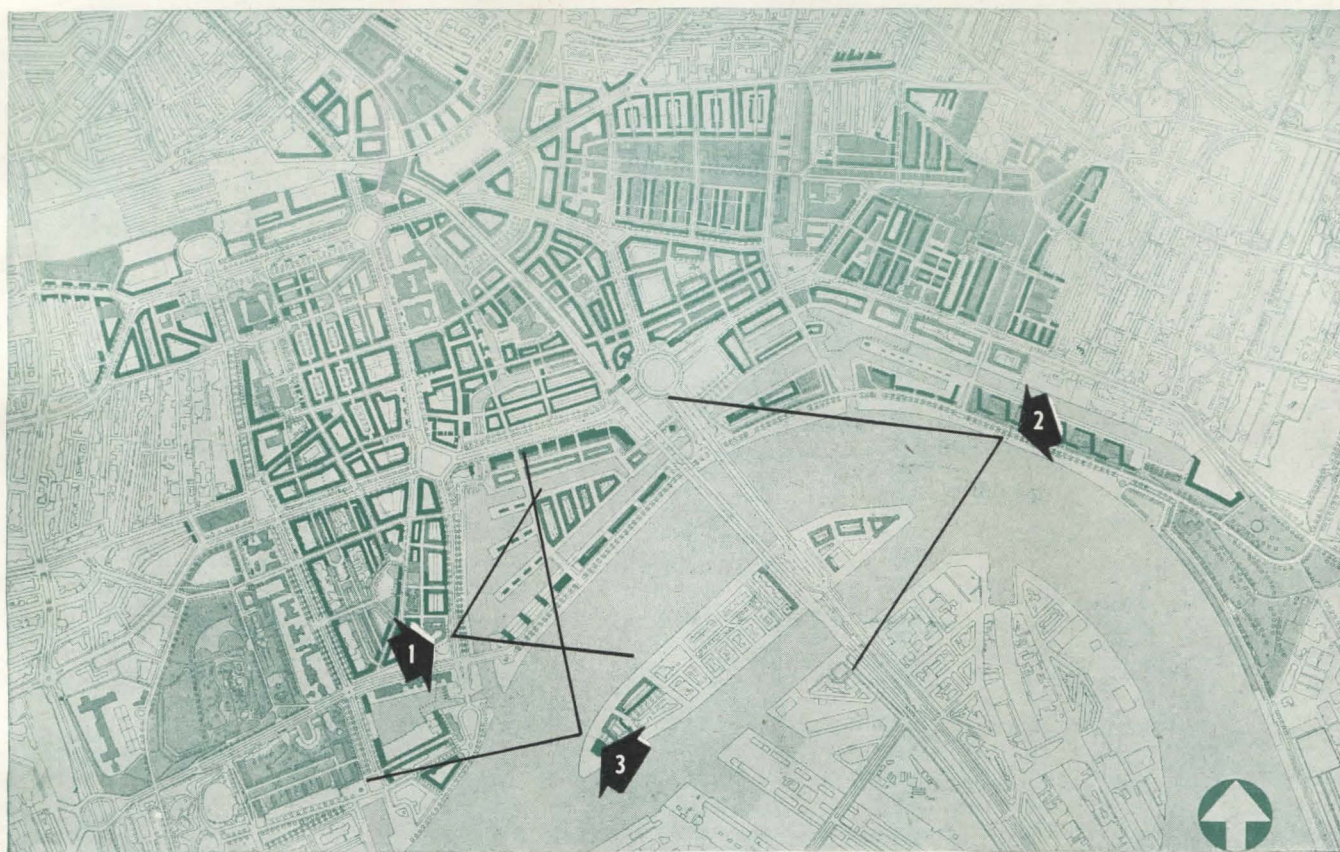
central station; a cultural group with concert halls, museums and public meeting halls is projected close to the existing park; a maritime center and seamen's quarters will be constructed in an area close to the waterfront; large industries will be excluded from Rotterdam proper, but small industries will be accommodated in designated areas; and housing, for the most part, will be located in outlying greenbelts.

For traffic circulation, the planners have worked out wide, tree-lined thoroughfares in the heart of the city and a parkway along the waterfront constructed on a

new dyke. All trains will arrive at the proposed central station, and the land now occupied by the Maas station will be available for housing. Trains from the south will cross the Maas River over a large suspension bridge and will proceed to the central station over a concrete viaduct. Foot passengers and vehicular traffic will cross the Maas on a suspension bridge also, and this traffic will be received in the new section of the city at a traffic circle located in one of the three large squares projected for the new heart of Rotterdam. Plenty of space is allowed for in planning the circulation scheme, except for



View 3: the western part of the central city as seen from the harbor. Wide tree-lined thoroughfares and canal bridges connect the various centers of the city and provide fast motor access to the docks



the streets in the shopping areas. These streets have been planned for pedestrian traffic only, and, consequently, will be narrow.

The execution of the new plan of Rotterdam is dependent upon the rejuvenation of the city's principal economic support, shipping. Everyone remembers the bombing attack, but few people outside of Holland are aware of the further damage the Germans were guilty of when they destroyed almost two miles of docks. The Rotterdammers have concentrated their main efforts in reconstruction on the repair of this damage,

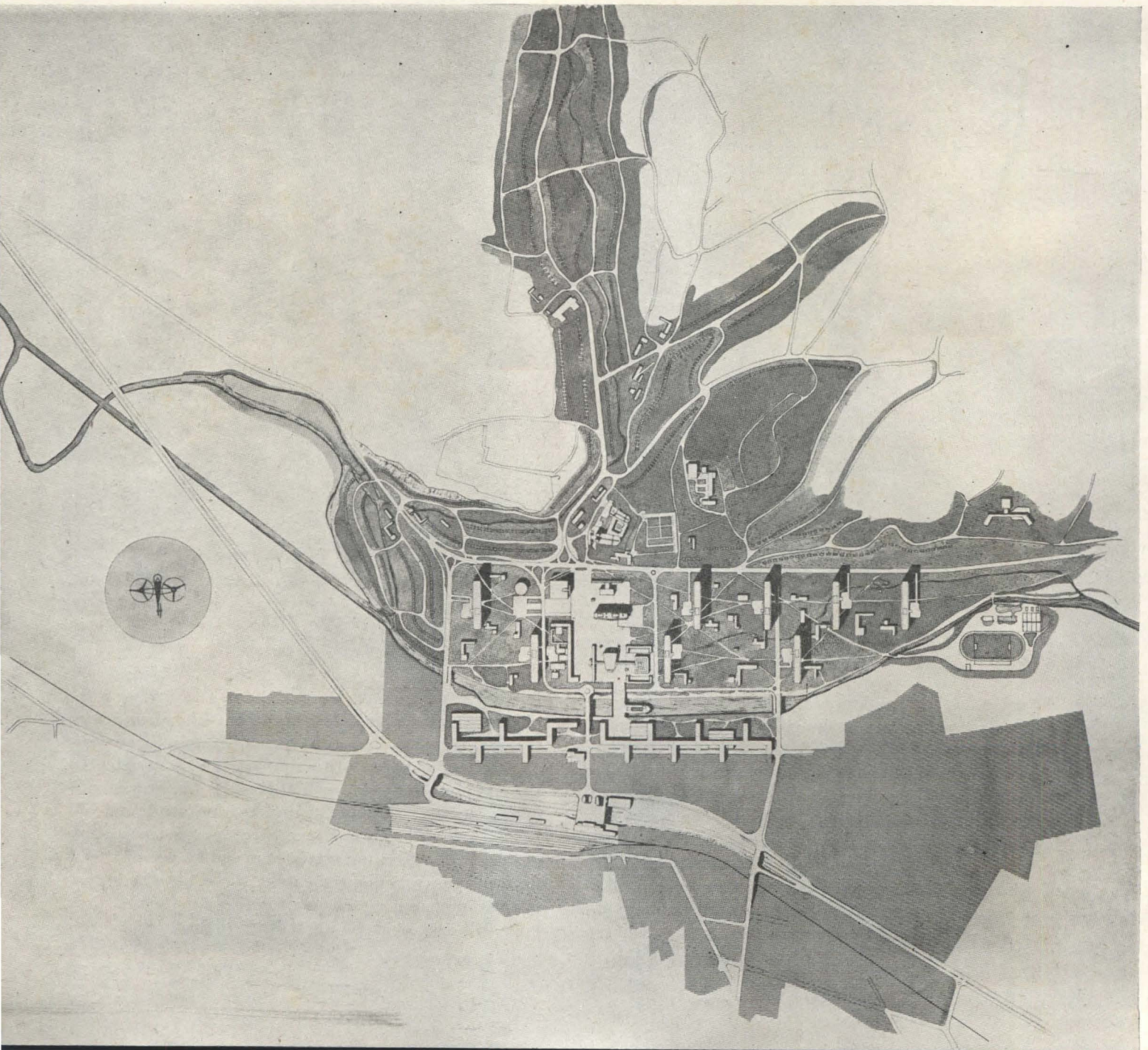
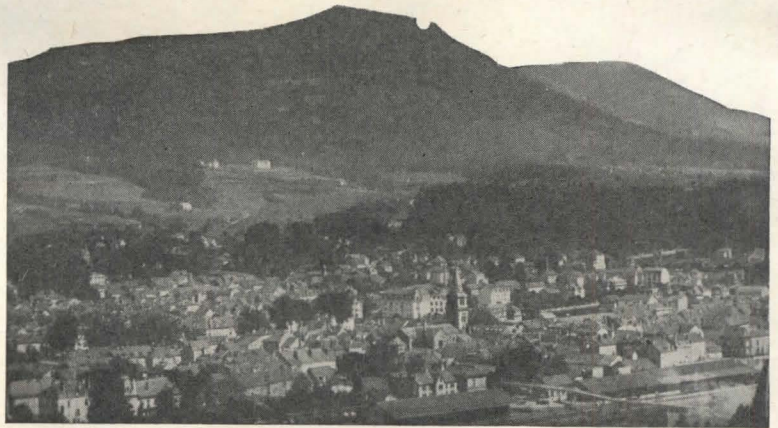
for they realize the desperate need of the city for a revival of the trade and shipping which flourished before the war. The city planners have made certain that everyone will be conscious of the importance of shipping to the city's economy and will appreciate the importance of the city as a shipping center. In the future one will be able to look down Coolsingel Street and see large ships at dock, and the entire waterfront will be open to view from the parkway along the dyke. Thus have they confidently prepared a welcome for the ships which they hope will once more tie up at Rotterdam.

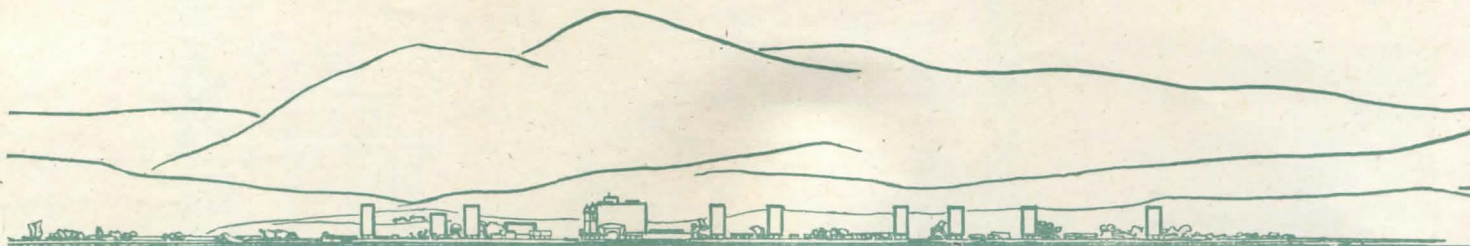
"The present program (10,500 victims) involves four living units and the garden cities radiating about the center of the city. However, the plan reproduced below envisages also several other living units; with these, this part of the city could one day count 20,000 inhabitants. To look for such a growth is nothing but wise foresight in what one calls a master plan.

"A master plan preserves the terrain and must permit execution in steps. At St. Dié the realization of the first can be immediate. It is the beginning of two vertical living units which can be industrially manufactured without delay anywhere in the country, then brought in and erected in place with record speed. And with one stroke the first three thousand residents of St. Dié will be sheltered.

"In the meantime all the other dispositions can be made for the construction of the horizontal garden cities. The factories, also, can be constructed industrially as soon as the program starts.

"It is understood that the buildings that were spared will remain among the new constructions, notably among the manufacturing buildings (to the south of the Meurthe) whose plan here is purely schematic." (Shaded area near highway shows older part of city.)





A PLAN FOR ST. DIE

Le Corbusier

BY LE CORBUSIER

WHEN I was called by the municipality and one of the associations of victims of the city to collaborate as counsellor in the reconstruction of St. Dié, I accepted for diverse reasons, notably the presence in that city of devoted friends of public well-being who are keenly aware of the need for an architecture which takes into consideration the conditions of modern life. Furthermore, St. Dié constitutes in its reurbanization, a living unit made up of a majority of workers in manufacturing industries (printshops, hat factories and spinning mills, etc.). The almost complete destruction of the ancient city had the result of clearing and bringing back into value the surrounding countryside, which is agreeable and charming. It is a revelation for the visitor and still more for the resident. This is a treasure regained, which it would be criminal to allow a lazy and inattentive urbanization to bury again at the bottom of courtyards or behind the walls of corridor streets.

The master plan must bring a solace to the labor of the workers, and especially to that of the women, housewives, who in modern life are crushed under the burden of domestic duties. Architecture and modern urbanism have the possibility of giving to domestic labor a greater efficacy with less effort. And the dispositions which may be made will lead to ways of life beneficial to the future. I am thinking here of a method of existence, a method of daily life which will free it from the lethargy which betrayed it and will continue to betray it if we are not careful. I am thinking also of the evils resulting from the industrial evolution — tentaculate cities and deserted fields — which we must try to remedy.

This was the problem for St. Dié:

Destroyed zone: A rectangle cleared by shell and fire, which was the very cradle of the city, the place where it was born and started to raise itself. Approximately

10,500 victims who are tenants and small property owners.

The project envisages the possible distribution of: 6,000 residents in buildings furnished with "communal services" and with "extensions of the dwelling"; that is the type of vertical garden city (four living units). 4,000 residents in individual family houses, of the horizontal garden city type. The proportion may be equally well 5,000 and 5,000 or 4,000 and 6,000.

We belong to a civilization characterized by a considerable development of large-scale industrial production. Work is an essential part of our daily life. The plan reintroduces it into the city as the integrating part of an urban life to which one tries to give dignity, a reason for being and strength.

The factories are grouped and combine all the technical facilities for a modern operation. They will constitute one of the aspects of the city scene, one of the essential parts of the urban activity.

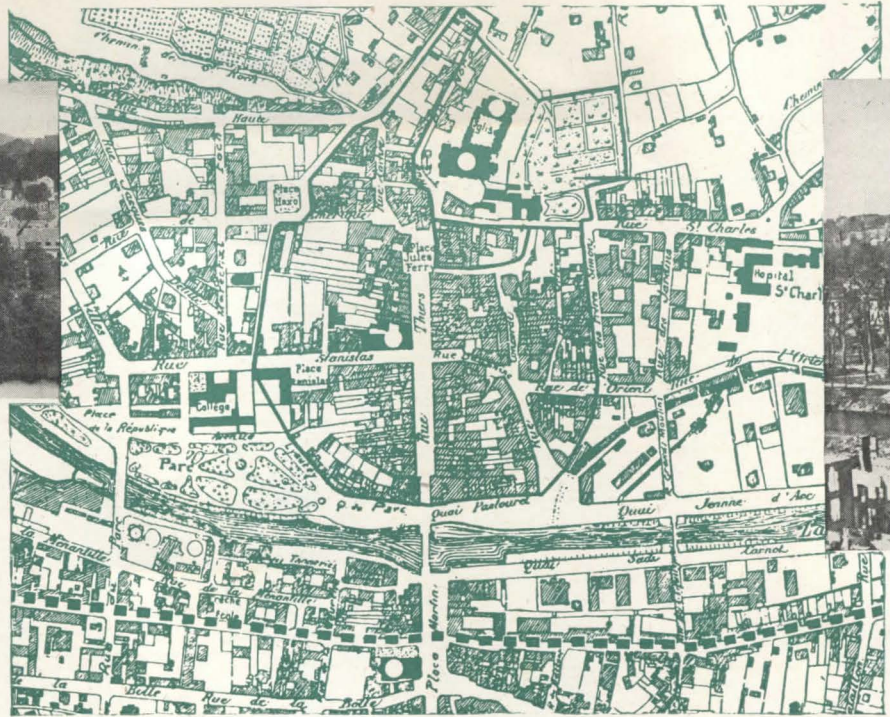
This group of factories, on the left bank of the Meurthe, occupies a territory covered with ruins. Naturally, the few buildings which escaped the disaster will be respected. The present master plan, in the form in which it is here published, is purely schematic.

The homes, provided with their "communal services" and their "prolongations," occupy the same terrain as the ancient city. Four living units accommodate about 6,000 persons. Fifty meters high, at the most, they mark themselves off against an immense space today liberated of all barriers. From each residence the view will be magnificent, on the higher floors even more than on the lower. (The plan is arranged for an eventual extension to eight living units.)

The living units offer the advantage over every other method of construction in that they permit an immediate commencement and take advantage of all the re-



Before it was razed by bombs, St. Dié was a typical French town, with rows of buildings packed together on streets laid out for an age of carts and pedestrians. But now "the misfortunes of war have left the soil free. Anything is permissible. Everything can be and must be planned."



sources of manufacture in series and all the quality of standardization. Better yet, in a region ravaged as St. Dié, they can be made industrial accomplishments (industry takes over construction), thus leading the world of production to eminently productive tasks.

The building industry has suffered so much since 1930 that it is not in condition to face the present tasks which are crushing. If industry takes over construction, or at least a part of the tasks, it is in effect the providential application of technique in a dramatic conjunction. But on another plan, the living unit offers the immense interest of lending itself economically and efficaciously to the installation of equipment for the preparation of food and for domestic service according to the formulas which bring to the housewife such relief as one would never suspect. We think also of the services of preventive and curative medicine; of dispensaries and emergency hospitals; of physical culture becoming then a regular function of the daily life; of heliotherapy and of hydrotherapy scientifically practiced.

Outside the buildings, and on the extensive level spaces which surround them, there are the prolongations of the home, to wit: the nurseries and the kindergartens, primary schools, the workshops or the clubs for adolescents, finally, the sports fields at the base of the home: races, tennis, basketball, football, swimming in the open air.

The surrounding free spaces may have yet other installations: In particular, well-organized vegetable gardens with common cultivation and automatic irrigation offered to those who want to cultivate their own gardens.

The second lot of homes will be made up of family dwellings having gardens, some large, some small.

Certain of these houses destined for a clientele of means may be constructed by private initiative. Others

for the use of more modest occupants may be planned in groups to gain the benefits of effective and economical series production.

The vertical garden city and the horizontal garden city can co-exist perfectly in harmonious relations. The experiment may bear fruit and the users will pronounce themselves one day in favor of one or the other formula.

Finally, in the center of the presently ruined territory of the city of St. Dié, there is a spot specially selected for the construction of the civic center.

The civic center is forbidden ground to automobiles; it is reserved for pedestrians. It groups in a single perspective the buildings of work, public and private administration and the cathedral. It includes as well the artisans' shops and the tourist center, the cafés with their terraces and their gardens, the amusement halls (cinemas, etc.), whatever one can call the department stores that have available space sufficient for the parking of vehicles belonging to the clientele from the country, finally the transient hotel and the hotel for tourists. The civic center is the pre-eminent place of the city, its heart and its brain. It is there that through monuments and through activities the city life develops and writes itself in history.

The primary schools form part of the living units (vertical or horizontal garden cities). The higher school could be built on the hill to the east of the cathedral, the hospital still further to the east. The fields for spectator sports would be installed on the plain to the east.

The Meurthe flows at the bottom of a cut 75 meters wide and with banks 4 or 5 meters high.

By means of a summer dam, it would be possible to obtain in season a magnificent expanse of water which would unite the cities of work, the civic center and the centers of habitation, and which would permit the healthy and attractive practice of water games.



"The bishop of St. Dié said to me, 'Have you noticed that the countryside has appeared since the city was razed — an admirable and consoling landscape. What a miracle if one could preserve it in reconstructing the city!' Up to the present the re-

markable landscape of hills and mountains that surround St. Dié was banished from the city as from the houses. The new project permits integrating it in all its splendor in the civic life as in the life of each individual — a daily stimulant."

"CROSSING THE THRESHOLD"

By *Claudius Petit*, Vice-president, Commission for Reconstruction and City Planning, *L'Assemblée Nationale Constituante*

FOR St. Dié, as for other cities, the great question is posed: "Shall we recommence the past? Shall we foretell the future by being of our time?"

The war left everywhere its train of ruin and misfortune. The ravaged cities, the mutilated houses, the overturned soil of our fields are all too numerous witnesses of this. Circumstances sometimes accentuate these destructions and make them symbolic.

St. Dié, where for the first time America received its name; where the Americans in the first war of liberty mounted their lines; St. Dié, goddaughter of America and dear to the hearts of American legionnaires, had to undergo the sadism of the barbarians.

Pitilessly, during a succession of days, each house was dynamited and burned. Nothing was spared; methodically, calmly, without any strategic military reason, the enemy satiated his vengeance. Everything that had a distinctive character, everything that constituted the civic center and contained the historic souvenirs has been reduced to a jumbled pile of stones. Only a few arcades of rose-colored sandstone attest a prosperous epoch. But, strangely, at the corner of a street a block of wall remained upright, bearing a plaque whereon is simply related the double sponsorship of America and of St. Dié. In spite of the barbarian, even the material testimony of this memory has not been effaced.

The past? Like many small cities grown up by hazard, without a master plan, in a banal diversity, St. Dié

spread out its houses along streets with no special character. The admirable landscape of hills was invisible behind the walls and the closely set houses. There, as elsewhere, chance had brought disorder.

The misfortunes of war have left the soil free. Anything is permissible. Everything can be and must be planned.

While Athens flamed, the Greeks won the battle of Salamis, and on the ruins of Athens they constructed the eternal Athens of the Acropolis and of the Parthenon. When the great fire destroyed Rennes at the beginning of the 18th century, it was rebuilt in the style of the period, for it is always true that man is capable of making a greater good come out of what seems an irreparable misfortune.

To pass from the city as we know it; formed of houses wed to the meanders of the streets, heaped up according to caprice, the fortunes and misfortunes of successive proprietors of the ground and buildings, and often shut off from the sun; to pass from the city, wayward child of the Middle Ages and of the Renaissance, where everything is measured by the pace of man and of the horse, the city astonished by every new growth, pounded and polluted by a devouring industrialism; to pass from this to the city of our time is not easy. It requires much audacity, perseverance, patience and convincing faith.

People do not like to change their habits. Often they have their ideas completely fixed. Understanding badly

THE tasks of urbanism and architecture which present themselves to authorities and to professionals seem to suggest modifications and innovations in the customs of practice in architects' offices. Truly the problems have become very complex.

In my opinion urbanism can exist only in three dimensions. That is the fundamental reform.

Urbanism is not really a question of road networks or of abstract regulations. It has for its mission to conceive the form, volume and size of the vessels necessary to contain the diverse functions that constitute the life of society: the dwellings, the places for work, the places for cultivation of body and spirit. These functions must be housed in "conditions of nature," which is to say that

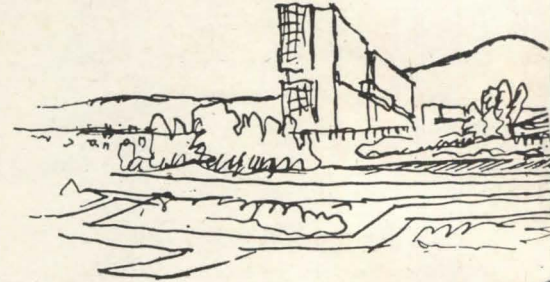
above all they must take into account the imperative law of the sun. The sun is the foremost consideration.

The vessels to contain these three cardinal elements are in reality living organisms; place them in contact and one has the phenomenon of circulation, a complementary element. The urbanist is a sociologist, at the same time that he is a humanist, also a technician.

One man alone cannot be administrator, engineer and architect, in the detail and exactitude required. But these three sorts of individuals must work together, must form an integrated unit.

Therefore I was called upon to create the first combination of such talents, the ATBAT, Atelier of Builders. We are building socially as well as technically and artistically. Building is setting up of

scaffolding, orchestrating, arranging; it is harmonizing everything. Our workshop of builders is, then, a cooperative which groups people belonging to the



the nature of the problems, they give definitive opinions which nothing can shake. It also happens that those who could and should enlighten them guard themselves from doing so, and prefer to follow the ill-informed in their error, rather than risk the opposition of the officials or of the electorate by showing them the healthy road to follow.

And yet! Who does not see in a plan as clear as that of Le Corbusier the happy synthesis of an industrious city, spacious, airy, open to the sun and to nature, having crossed the threshold? Man has here become once more a free pedestrian, relieved of the autos which are put in their place on their ways. Here quietude returns to the heart of the woman watching her children.

The man and the woman are workers. They are workers who, when day is ended, live in quarters handsomer than any dream. Everything is harmony. The volumes compose themselves in the sky. The civic center is ordered on the scale of the little city of workers. It is the normal meeting place near the shops, the cinemas, the clubs, for the youth and the active part of the population. A judicious proportion of individual houses is planned, permitting a comparison between the two propositions: vertical garden cities and horizontal garden cities. Here, contrary to all the slogans in vogue, one does not exclude the other. Perhaps it may even be that the horizontal is only possible in combination with the vertical. But it is permitted to think that the latter gives greater comfort, and, with the prolongations of the home and the services of these buildings, more liberty, particularly to the woman, mother of a family.

Municipal officeholders, if they wish to be good administrators, must be attentive to this aspect of the problem which is too often forgotten: the price of maintenance and use of a city which is all low and of another which is all high. With equal comfort and equal rate of

return, it must be possible to make some choice, and possibly a point of equilibrium can be established where everyone will pay according to the expense he imposes on the community. The roads are expensive, likewise the sidewalks, the sewers, piping of all sorts, as well as the steps of the postman!

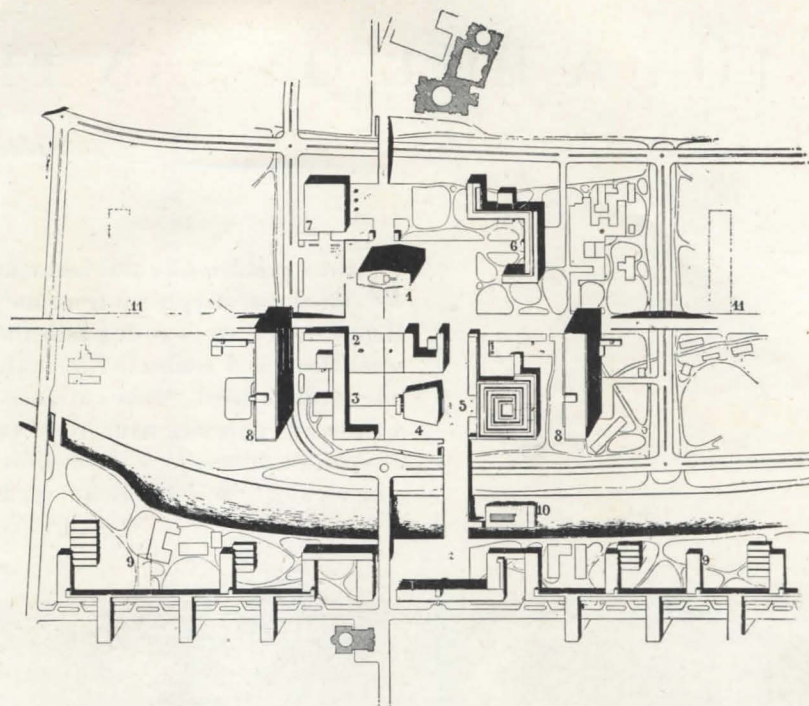
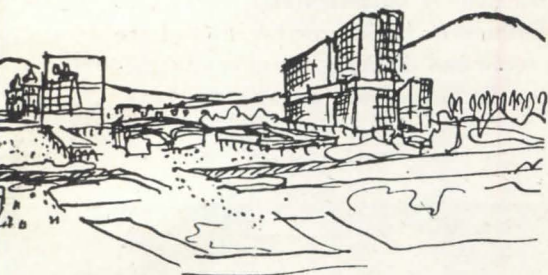
Who does not see the solid bonds that tie this project to the great accomplishments of ancient times? It is in the tradition of the great builders — that of the Roman cities, of the cathedrals and of the chateaux, of the royal squares that have so profoundly marked the French cities. The tourists from all corners of France, from all parts of the world, after having seen the Place de la Concorde, the Place Vendome, the Place Stanislas, would go to see St.-Dié-the-New, who will be proud to be the first in the world, before all her big sisters who try by patchwork to adapt themselves to the present-day necessities, to cross the threshold, to be of her time. She would be sure of herself, industrious little city, strong in the health and joy of her workers, for whom she made herself beautiful and pleasant.

It is necessary that we be able to cease to speak in the conditional. This plan, so beautiful in its simplicity, must become reality. Certainly, it can be retouched, reformed, adjusted. This is only the first draught. But if the master idea remains, St. Dié, the godmother of America, St. Dié, the goddaughter of America, St. Dié, the martyr, the useless victim of barbarity, can become the symbol of the rebirth of our country and of the coming of the new times.

What greater sign of confidence in the future of the country could one seek than that a little city entirely devoted to work, marked by destiny, should be the first to cross the threshold?

Will the timid and the fearful permit the reasonable to work? Only the bold are reasonable.

three callings mentioned above, of diverse ages and experience. Such is the organization conceived to respond to the tasks of architecture and urbanism.



ST. DIE, "GODMOTHER OF AMERICA"

Bombs and fires respect a plaque commemorating the naming of America

IN 1507, there existed at St. Dié a small group of humanists composed in large part of members of the Chauvinist Chapter, and whom the Duke of Lorraine, Rene II, himself imbued with the sciences and geography, patronized. This little group which called itself the Gymnasium of the Vosges, had adopted the idea of popularizing the scientific knowledge of the epoch, and the first step toward the realization of this project had been the creation of a printing establishment. The sponsor of the printing shop was the Duke's chaplain and secretary, Vautrin Lud, and the two directors were Martin Waldseemuller and Mathias Ringmann. To inaugurate their project they decided to re-edit the cosmography of Ptolemy and to publish a planisphere and a world map which would be the materialization of the work.

Now, at the moment when the work was under way, and while Ringmann was editing a little work which was to serve as preface to the book, the Duke of Lorraine received a copy of the account of the four voyages of Amerigo Vespucci in the new world. He passed the book to his chaplain, who in turn showed it to the printers. These men were ignorant of the name of Christopher Columbus, whose voyages, for mercantile reasons, had carefully been kept secret by the Spanish rulers, became excited about the accounts, and Ringmann put in his "Cosmography" the following text:

"Now, since these parts (of the world) have been thoroughly explored, and a fourth part has been discovered by Americus Vespuccius, I see nothing that could prevent, after the discovery by this Americus, a wise and ingenious man, that it be called Amerige, or land of

Americus, or America, inasmuch as Europe and Asia both have been given feminine names."

Waldseemuller, for his part, engraved on his map the name America on the location of the new continent. Thus, for the first time the name of America was printed at St. Dié on April 25, 1507.

It is even possible to go further back in history. In 1410, Pierre d'Ailly, Grand Prevost of St. Dié, in his book entitled "The Image of the World" asserted the thesis, that unknown lands must exist, and that they would be discovered by going westward from Europe. It was reading this book that incited Christopher Columbus to undertake his voyage.

In 1911, a commemorative plaque was placed on the house that had replaced the printing shop of the Gymnasium Vosgien. Celebrations took place the 15th and 16th of July, in the presence of the American Ambassador, Mr. Robert Bacon. He was given portraits of Vautrin Lud, Ringmann and Waldseemuller to be transmitted to his government. In an eloquent speech Mr. Bacon associated with these celebrations the memory of the independence of the United States.

In 1921 the American Legion paid a visit to St. Dié, and a commemorative celebration took place at that time, during which a second plaque was placed below the first.

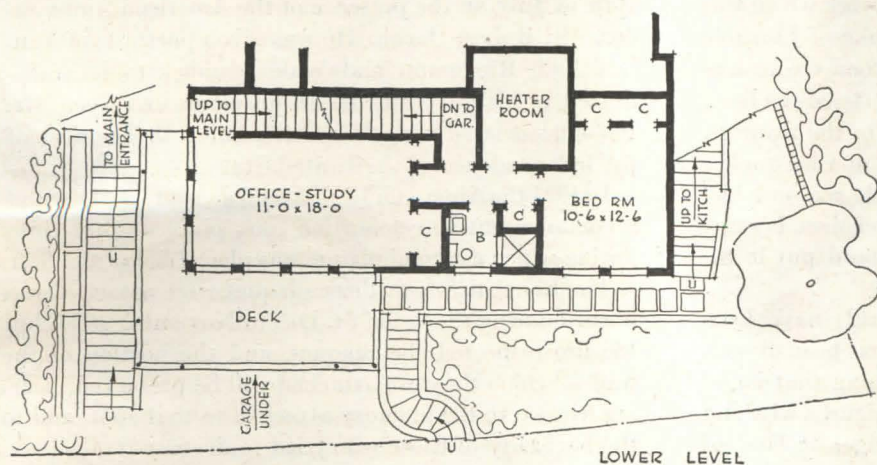
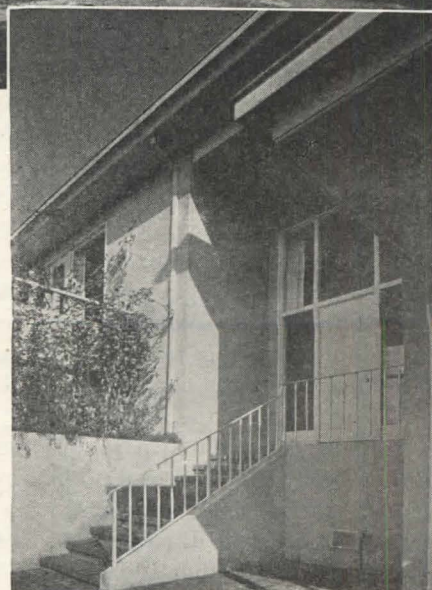
The house to which these plaques were attached was burned during the fire of St. Dié, in November 1944, but the fire respected the plaques, and the portion of the wall to which they are attached will be preserved, bearing witness to the memory attached to that spot, and to the barbarity of those who tried to destroy it.

FOR A HILL ON SAN FRANCISCO BAY

Residence for Mrs. Marjerie Myers, Piedmont, Cal.

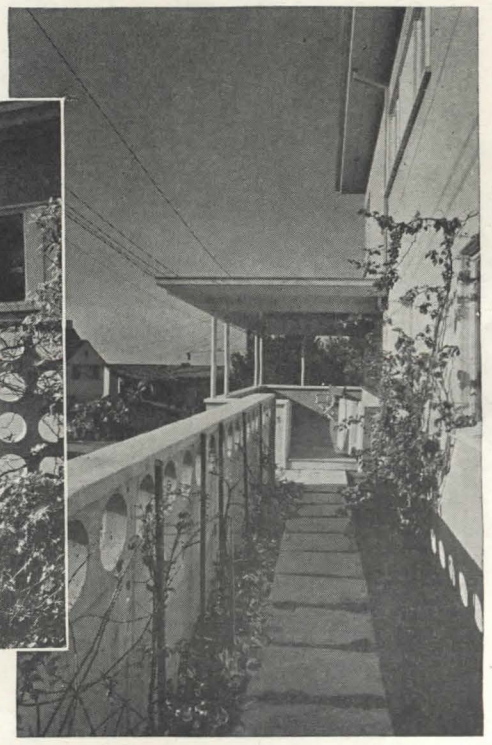
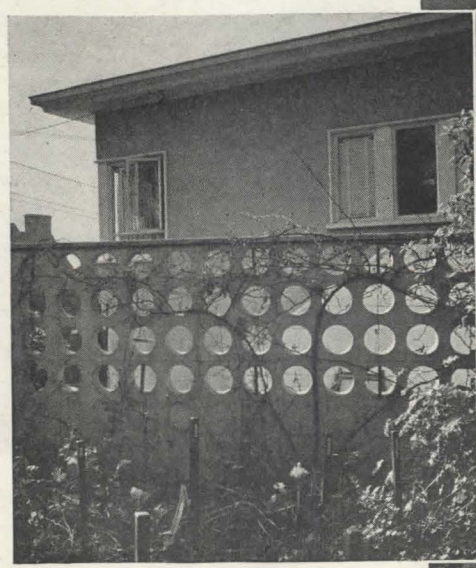
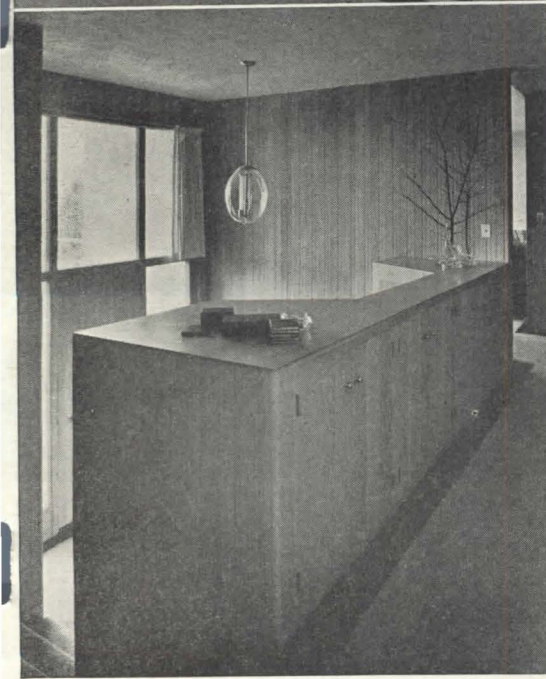
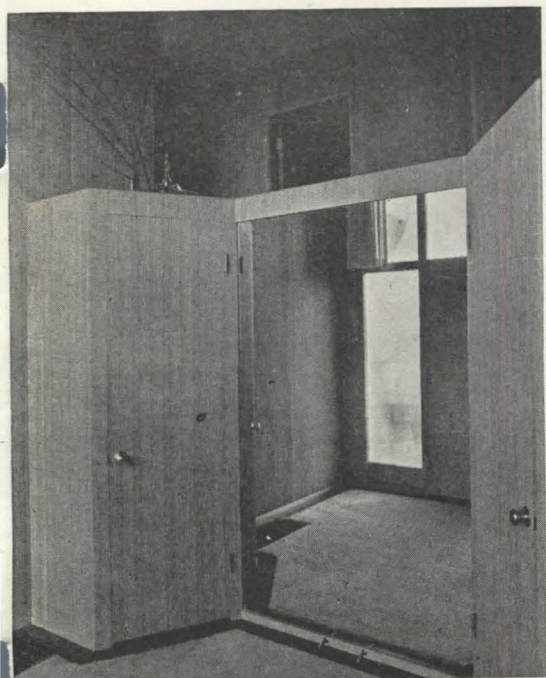
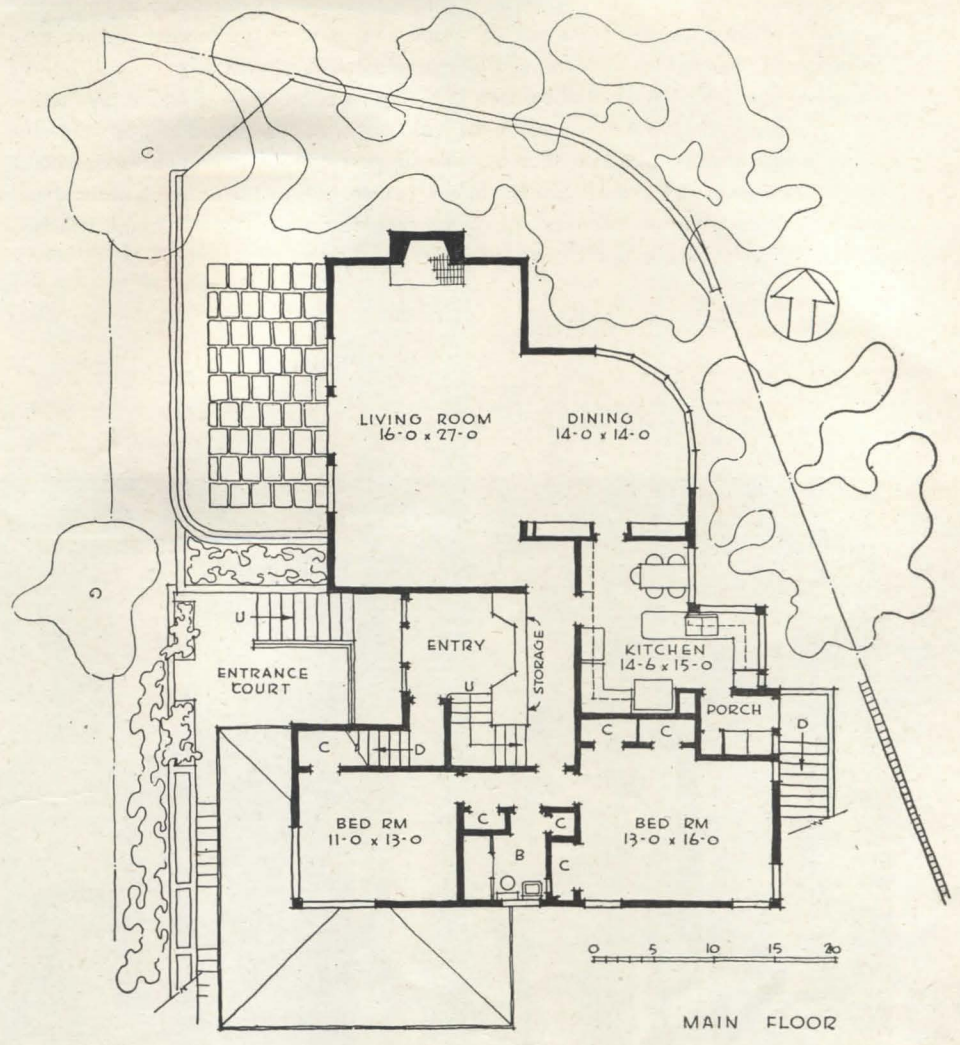
Michael Goodman, Architect

DESIGN problems for this house were largely matters of site limitations: the lot slopes steeply up from the sidewalk, and was also restricted in size. Hence the garage was dug into the bank, more than two stories below the main floor, and connected to it through a residential office then up to an intermediate level. Main entrance is reached by outside stairs, leading to a two-story entrance hall. All of the climbing involved now begins to have its compensations, for combined living room and dining room offer magnificent views of San Francisco Bay, and, in the foreground, a rear garden.

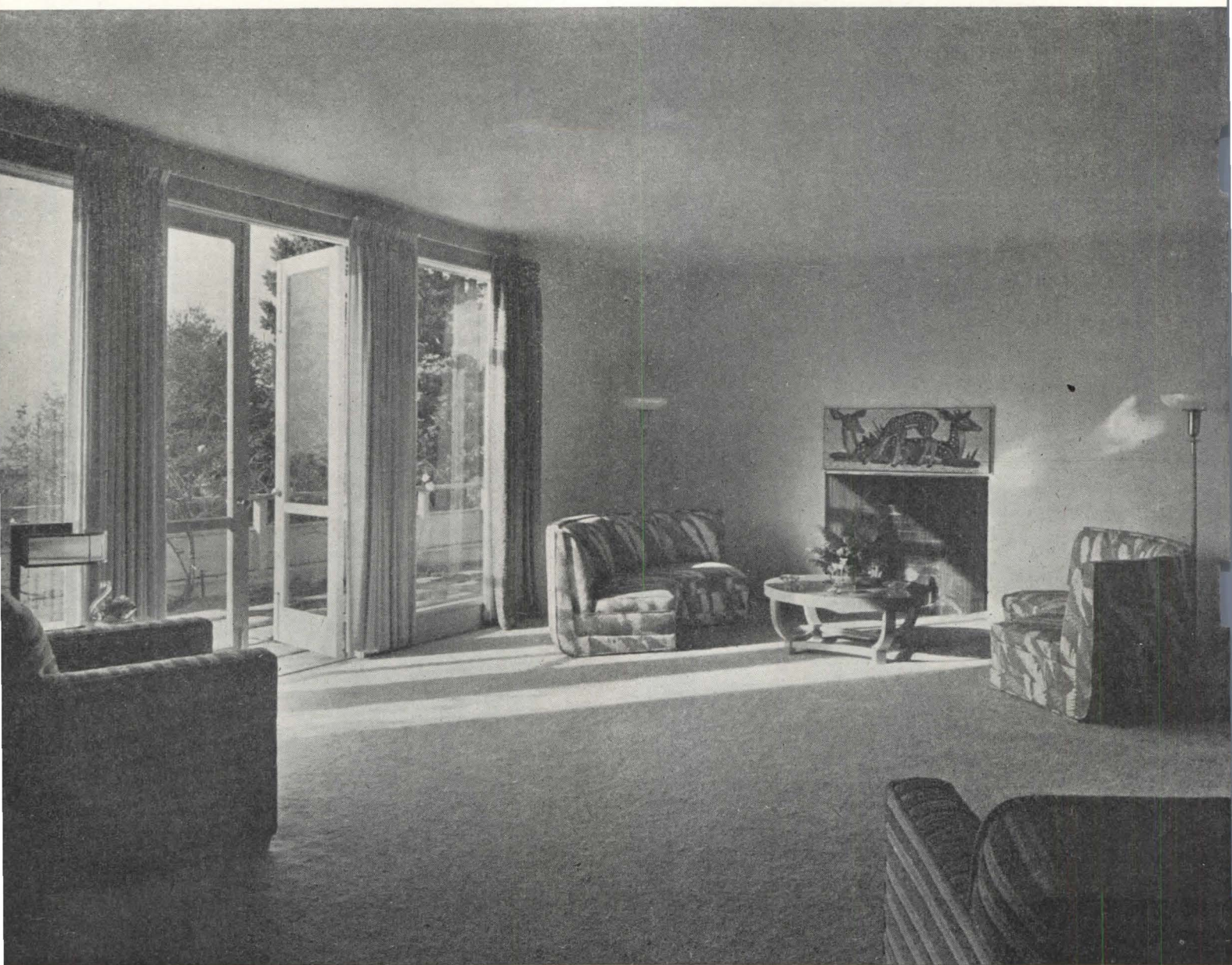


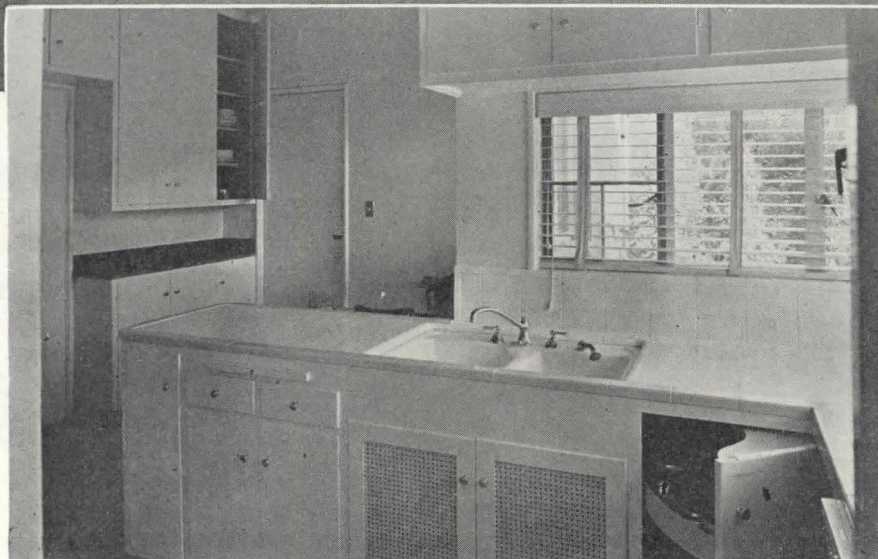
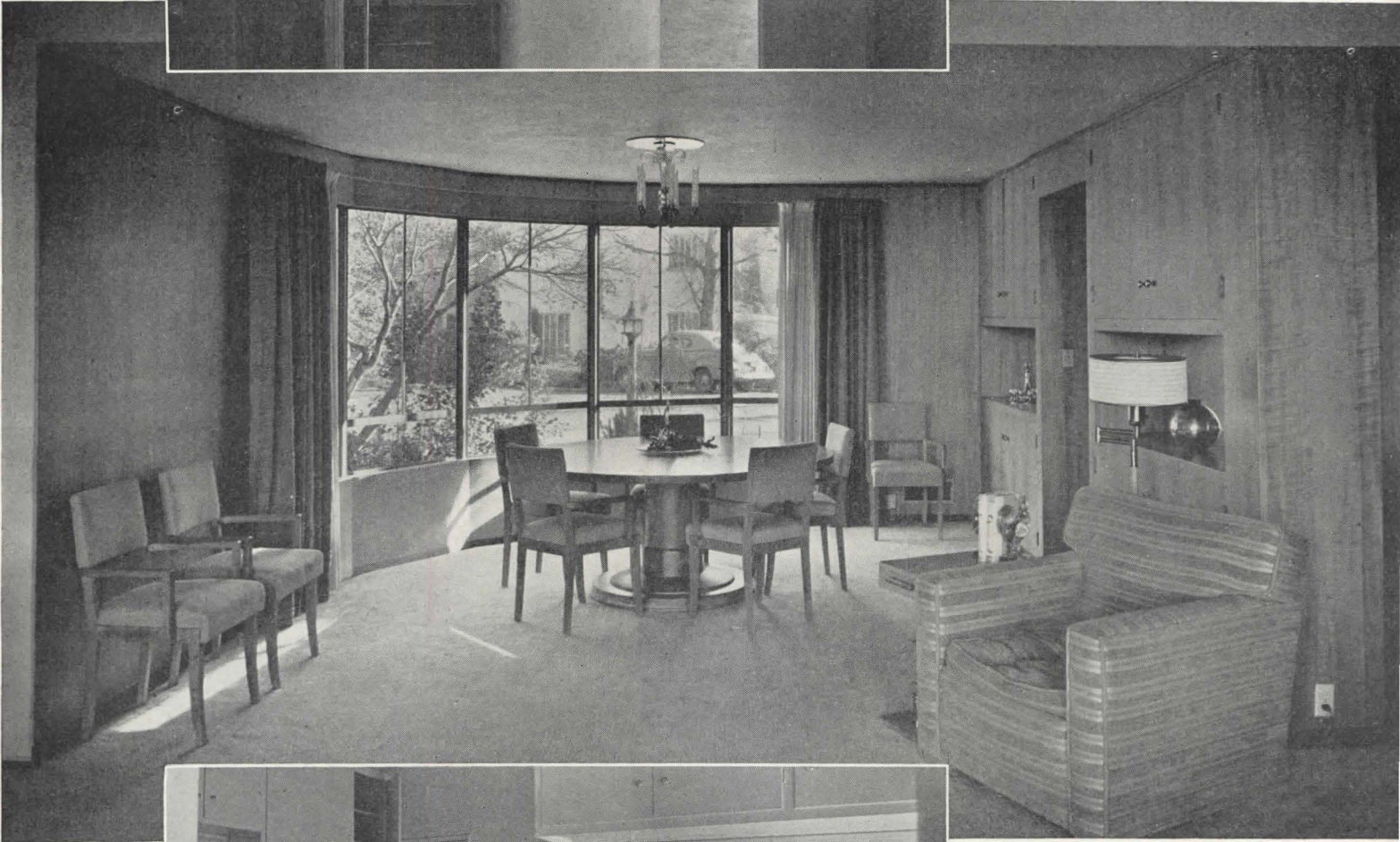
LOWER LEVEL

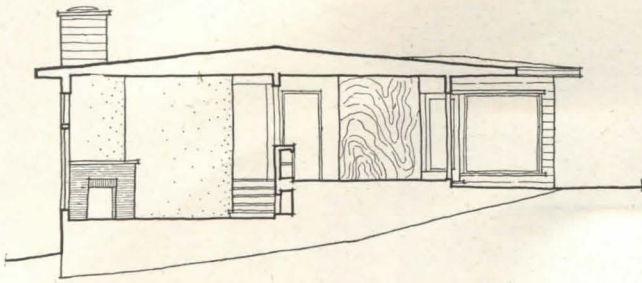
Two-story entrance hall (two views below) provides two coat closets on the lower level and storage cabinets above. On its upper level it also serves as corridor between living room and bedrooms. Concrete enclosing walls (lower right) are built on post hole foundations to prevent settling and displacement on hillside locations



Living room doors of the Myers house open onto a high terrace overlooking San Francisco Bay, with enclosed garden at the rear of the site. Interior walls are finished in white sand finish stucco, painted in light colors. The over-mantel decoration is a colored pebble mosaic by Puccinelli. Walls and cabinets in dining room are done in D'Oro plywood in natural straw finish. In the entrance hall the walls are of combed wood in gray stain. The house is built of wood frame construction, with composition roof, gray-pink stucco exterior finish, with woodwork painted cream. In the kitchen a long tile-surfaced cabinet sink extends out as a low partition cutting off the breakfast area. Generous high windows provide plenty of daylight, also supervisory view of play patio



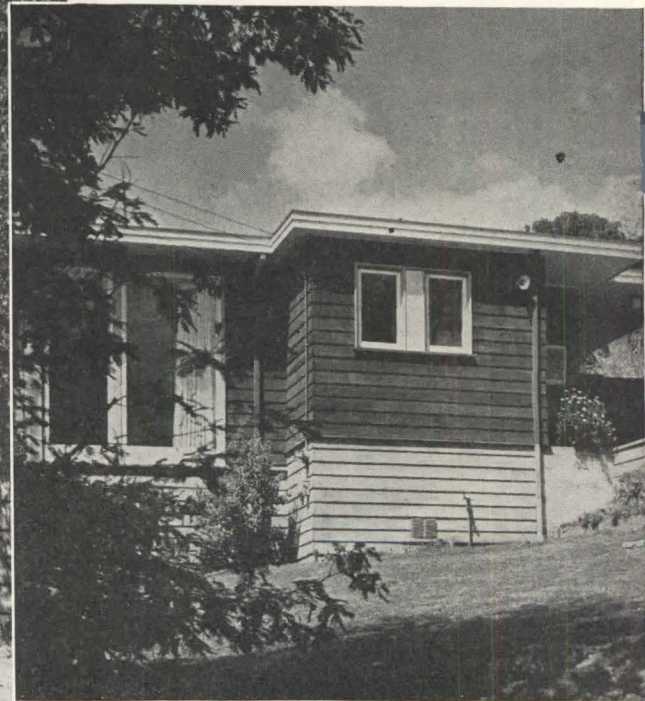




TWO-LEVEL SCHEME

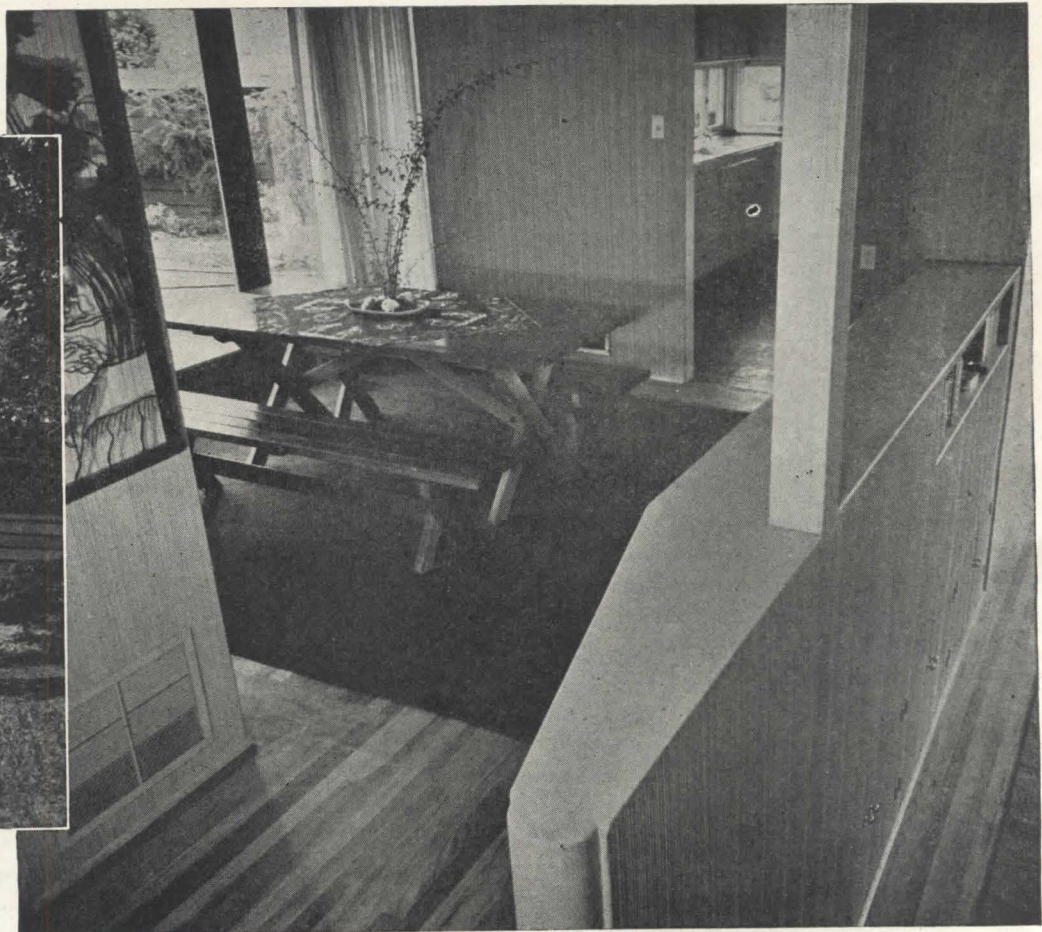
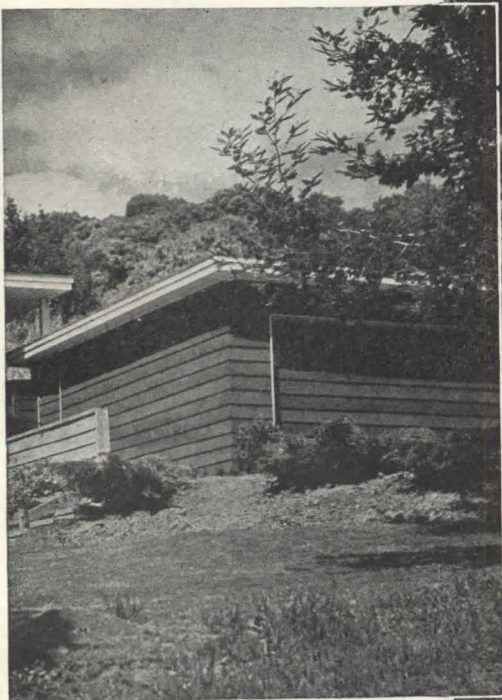
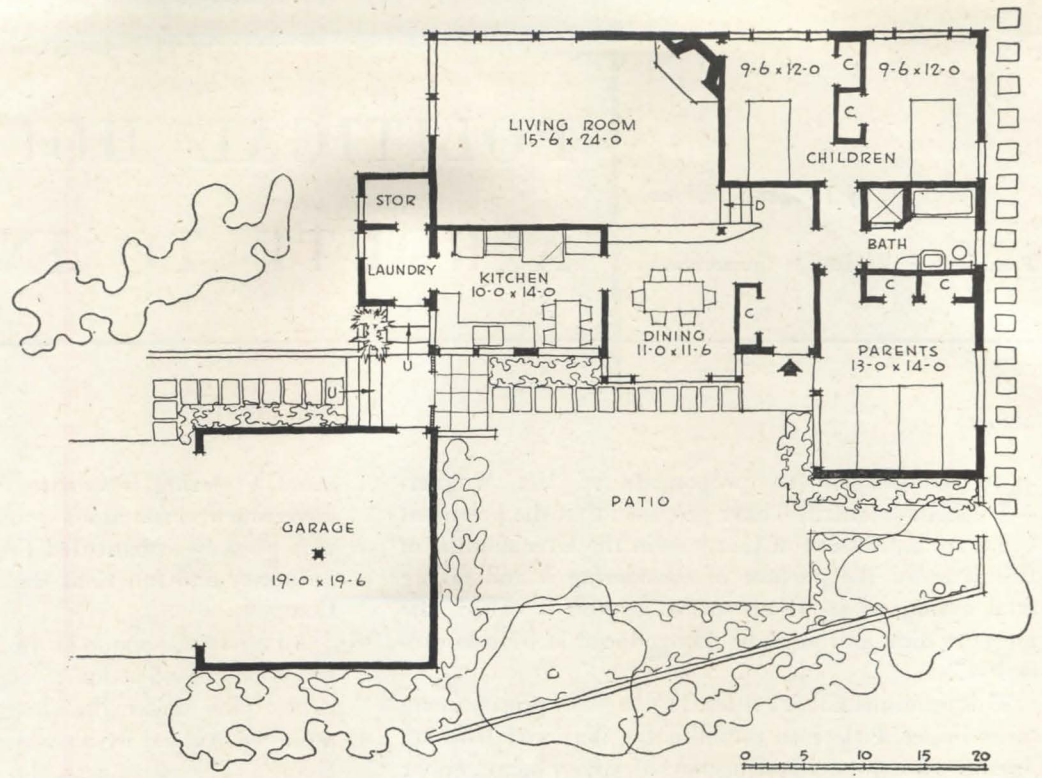
EVERY California house has a view, and architects are forever developing new wrinkles of levels, terraces, vista devices to capitalize on hillside plots that look down valleys or valley sites that look upward toward mountains. In this case the view is downward, and the device is new only in use. It is what is sometimes called a dropped living room, here having the extra purpose of making the dining space virtually a gallery from which to enjoy the view through living room windows. Even the patio gets a piece of the view, right through the house. Or, the guest in the entrance foyer has the same elevated viewpoint. Here is one place in which the old dropped living room idea has a purpose.

*Residence in Orinda, California,
Michael Goodman, Architect*



PHILIP FEIN Photos

FOR A VIEW



POLITICAL HOUSING— A ROUTE TO INFLATION

By Thomas S. Holden

President, F. W. Dodge Corporation

NON-CONGRESSIONAL proponents of the Wagner-Ellender-Taft Bill have proposed that the President call a special session of Congress in the later months of this year for the purpose of considering it and taking final action on it. If no special session is called, the measure dies, and must be reintroduced in both houses in 1947.

This omnibus bill (11 titles, 116 pages of printed text) seeks under Title I to establish the National Housing Agency as a permanent agency of government, under which would be consolidated the Federal Home Loan Bank Administration and its various constituent agencies, the Federal Housing Administration, and the Federal Public Housing Authority.

Concentration of Power

Such consolidation would abolish permanently the Federal Home Loan Bank Board, which was created by Congress and has not yet been abolished by that body, though temporarily suspended by the administrative order which created the National Housing Agency as a temporary war agency. This consolidation would reduce the commissioners of the three constituent agencies of the permanent NHA to the status of mere administrative deputies. It would concentrate the policy making power for these three agencies in the hands of a single politically appointed administrator. The Home Loan Bank System's member institutions have assets totaling over \$6,000,000,000. The Federal Housing Administration has mortgage insurance in force totaling more than \$7,500,000,000. These two federal agencies constitute a dominant factor in the mortgage lending and private long-term investment of the people's savings. It is to me unthinkable that Congress will authorize the concentration of power over these agencies that is contemplated in Title I. If the pattern of unification that is here proposed should be followed, the least that Congress can do to assure the people of this country that sound policies will be followed under such unification would be to put the policy-making and coordinating function under the jurisdiction of a well-selected board, rather than under an individual.

Furthermore, consolidation of the two great agencies that deal with private savings and mortgage finance, with FPHA, which deals exclusively with government grants in furtherance of a social welfare program, pre-

sents a glaring inconsistency. Sound organization of governmental functions would place FHLBA and FHA in a properly constituted Federal Loan Agency, whose authority and functions should be carefully defined by Congress.

An effort was made in the 79th Congress to rush this proposed consolidation through Congress as a reorganization plan under the Reorganization Act. This proposal was vetoed by a concurrent resolution of the two Houses. The effort was also made to sell the General Housing Act to Congress and the public on the plea of emergency. Indeed, the specious emergency plea was largely responsible for the speedy passage of the measure by the Senate.

This emergency plea has no foundation in fact. The present housing emergency is due to shortages of materials and to confused trends in material prices and construction costs. Congress has dealt with these emergency conditions by other legislation. There is nothing in the General Housing Act having any bearing upon these emergency conditions. This is a long-term measure, to be judged solely on long-term considerations. The speciousness of the emergency plea adds weight to the contention of some critics that the veterans' emergency housing program is mainly a political subterfuge whose real purpose is to put through this planned-economy measure.

Rather than enter into a detailed discussion of the remainder of this Bill, title by title, I shall attempt to summarize the considerations that have prompted me to oppose this Bill in its present form.

"Need" Based on Imaginary Statistics

Aside from the emergency plea, which seems to me entirely specious, the supposed need for this legislation has been presented to the Congress and the public by means of a quite fanciful picture of the long-term housing needs of the country, a picture composed of imaginary statistics.

In November, 1944, the National Housing Agency published a report entitled "Housing Needs." It purported to show a need for the construction of 12,600,000 new non-farm dwelling units in the United States during the first ten years following the war. Such a program would call for new construction at an average annual rate of 1,260,000 units a year. This figure has

"It is to me unthinkable that Congress will authorize the concentration of power over these agencies that is contemplated in Title I."

"This is a proposal for a government-sponsored housing boom of vastly greater proportions than any speculative boom of the past . . . In short this Bill is highly inflationary . . . Titles III and IV . . . include provisions for liberalization of private mortgage lending and government mortgage insuring practices which . . . would be positively harmful."

"Long-term commitments for federal grants-in-aid under Titles VI, VII, and VIII total \$133,000,000 a year for 45 years, an aggregate of \$6,000,000,000. It is proposed that Congress make these long-term commitments at a time when the need for them cannot possibly be proved and when the primary fiscal problem of the nation is to balance its budget."

"There may be some possible merit in Title V . . . an experiment . . . can do no harm and might prove beneficial."

been quoted repeatedly by numerous proponents of this Bill.

The earlier postwar decade of the 1920's had housing production at an estimated average annual rate of 700,000 new family dwelling units a year. That earlier postwar decade had the largest numerical increase in population, the greatest peacetime prosperity, and the largest volume of construction activity of any decade in the country's history. These facts immediately raise the question as to whether the NHA estimates of needs for the coming decade may not be excessive.

New Families and Replacement Rates

According to the NHA report the supposed need for 1,260,000 new family units a year was composed of two equal parts:

1. A primary need of 630,000 units annually to take care of actual increase in families plus migration from farms, servicemen's households to be established or reestablished, undoubling of married couples living with another head of family and a 5 per cent vacancy allowance.

2. An additional secondary need of 630,000 units a year in order to replace each year one-twentieth of the country's substandard structures; that is to say, structures supposed to be substandard according to certain statistical data reported in the housing census of 1940.

It is this projected replacement rate of 630,000 units a year that is subject to question.

The same NHA report stated that the replacement rate during the twenty years 1920-1939 averaged 40,000 units a year. Each year some 20,000 units were destroyed by fire or other calamity, and another 20,000 were demolished to make way for some non-housing type of development or improvement.

Questionable Economics

Few people, if any, would question the desirability of increasing the country's previous rate of replacement of old and substandard housing accommodations. As to whether it is practical or economical to step up the replacement rate from 40,000 units a year to 630,000 units a year there is a serious question. A careful estimate of the cost to the national economy of scrapping old buildings at the recommended rate gives a minimum figure of a billion dollars a year for the loss to be absorbed by

owners, mortgagees or government. Furthermore, there is no evidence to show that either the 1940 census enumerators who reported data as to structures needing major repairs and structures either having or lacking running water and plumbing and heating facilities, or the economists in the office of NHA, had any knowledge as to how many of the supposedly substandard units were actually susceptible of improvement.

Census Bureau Reports Improved Housing Facts

As a matter of fact, a great deal of improvement in the country's housing standards actually took place between 1940 and 1945, without benefit of this proposed legislation and in spite of the handicaps of a war economy.

I make this statement on the basis of the spot survey of housing conditions made by the Census Bureau in November, 1945. That survey showed, as between April, 1940 and November, 1945, the following improvements in housing conditions:

1. Home ownership increased from 44 per cent to 53 per cent.
2. Units needing no major repairs increased from 82 per cent to 89 per cent.
3. Units having private bath and private toilet increased from 52 per cent to 62 per cent.
4. Units with central heating increased from 58 per cent to 61 per cent.
5. Units with electric lighting increased from 79 per cent to 89 per cent.
6. Evidence of improved occupancy conditions was also shown. The number of units occupied by more than four persons declined from 27 per cent to less than 22 per cent; the number with more than one person per room declined from more than 20 per cent to less than 15 per cent.

This survey report was not published until last May 16, thirty-one days after the Senate passed the General Housing Bill in the form given to the House of Representatives. It was previously argued before the Senate and the public that housing conditions had deteriorated during the war. On March 16, 1946, Mr. Chester Bowles said over the radio: "Naturally, the condition of our homes got a lot worse during the war — the 7,000,000 substandard city homes of 1940 grew to 10,500,000." Mr. Wilson Wyatt made a similar state-

ment before a public housing group in New York. While these two gentlemen may not have had, at the time these statements were made, personal knowledge of the Census facts that belied their statements, there is strong suspicion of attempted suppression of the Census report by obstructionist tactics of people in OPA and NHA.

These statistical matters have been cited in some detail to support the following propositions which I hold to be true:

1. Improved housing conditions can be effected by the people of this country in a period of reasonable prosperity without excessive liberalization of housing finance or lavish government subsidies.

2. The NHA estimates of postwar housing needs of the country are fantastic; they are figures blown up for use as sales arguments to Congress and the public, without sound economic validity.

It is my strong belief, on the basis of careful study of all the available facts, that a program for construction of 12,600,000 new non-farm dwelling units in ten years, if actually carried out by means of this legislation or by any other means, would so far outstrip the actual housing needs of the country as to create an economic crisis of the first order. I do not believe that, even under the most prosperous conditions possible, the market can possibly absorb new housing accommodations at the rate of production proponents of this Bill promise to accomplish. This is a proposal for a government-sponsored housing boom of vastly greater proportions than any speculative boom of the past, or any boom at all likely to be stimulated in the future by private builders, real estate men or speculators. In short this Bill is highly inflationary.

Inflationary Features of the Bill

Inflationary features of this proposed Bill are of two kinds:

1. Over-liberalization of housing finance, as provided in Titles III, IV and possibly VIII.

2. Long-term commitments for government spending, in the form of grants for public housing and for urban redevelopment, as provided in Titles VI and VII.

Titles III and IV, which would amend the Federal Home Loan Bank Act, the Home Owners Loan Act of 1933, the National Housing Act, and the United States Housing Act of 1937, include provisions for liberalization of private mortgage lending and government mortgage insuring practices which I consider excessive. Under the legislation of the past 14 years the Federal Home Loan Bank System and the mortgage-insurance system of the Federal Housing Administration have functioned with gratifying success. These agencies are well established and well prepared to meet all presently foreseeable needs for home-financing. In addition, the Congress has provided extremely liberal home-financing facilities for veterans under the G.I. Bill of Rights. With private

mortgage money amply available at this time and with tested financing machinery in full operation, such liberalization as is proposed in the General Housing Bill would be positively harmful. It is not only inflationary, in view of present conditions, but is contrary to sound principles of mortgage finance.

Unneeded Federal Subsidies

Long-term commitments for federal grants in aid under Titles VI, VII and VIII total \$133,000,000 a year for 45 years, an aggregate of \$6,000,000,000. It is proposed that Congress make these long-term commitments at a time when the need for them cannot possibly be proved and when the primary fiscal problem of the nation is to balance its budget.

At a time when we have approximately full employment with wages the highest in history and with many important industries and trades suffering from labor shortages it is absurd to make large commitments for subsidized housing. If there should be later a demonstrated need for grants-in-aid to public housing, Congress can then make suitable provision for them.

Grants-in-aid for urban rehabilitation, as proposed in Title VI, are unnecessary and are potentially demoralizing. Federal subsidies to local governments and the agencies thereof are generally unsound in principle and should be used only as temporary expedients in drastic emergency situations. Financial dependence of local governments upon the federal treasury tends to by-pass the authority of the states, to further centralization of power and to encourage political abuses. Furthermore, federal subsidies in aid of purely local governmental functions, including public works and improvement programs, tend toward extravagance and waste.

The problem of urban redevelopment, which Title VI aims to solve, has long engaged the attention of business and civic groups throughout the nation. Twenty-two states have adopted laws offering specific encouragement for urban redevelopment; most of them seek to encourage private enterprise and private capital to undertake the job; powers of condemnation and tax-incentives are the inducements offered.

Since the first of these laws was enacted as late as April, 1941, they have all been thus far precluded from functioning effectively by war conditions and war and postwar restrictions. Their actual functioning (as written or as they may be later amended) will depend very largely on the postwar relationships of rents and development costs, relationships which must reach a more stable condition than at present before investment will be forthcoming. These state laws should be given an opportunity to perform under peacetime conditions before the highly dubious expedient of Federal subsidy is resorted to.

While opposed to federal grants-in-aid to local governments, I consider it entirely possible that sound pro-

vision could be made for extending credit or insuring mortgages in ways that would facilitate local redevelopment programs without injecting the federal government improperly into local government affairs.

In spite of my opposition to this Bill as a whole, I find merit in some of the provisions of the General Housing Act. However, such meritorious activities as are proposed do not require the unification of housing agencies that is called for under Title I. Those which are needed can be more soundly provided by separate legislation than by enactment of this omnibus Bill.

I refer specifically to technological and economic research in housing, the subject of Title II, and the annual housing inventory, which is the subject of Title X. These functions, under proper enactment, could be assigned either to the Federal Home Loan Bank Administration or the Federal Housing Administration, or to some appropriately constituted coordinating agency. They might even be properly assigned to the Department of Commerce. The annual housing inventory should be conceived as a matter of providing public information, not as a basis of government programming of all the public and private housing activity of the country.

There may be some possible merit in Title V, which provides for yield insurance to be administered by FHA. The insurance provisions are conservatively safeguarded; I do not consider them inflationary, though some people do. I do not know whether as a practical matter the proposed yield insurance would encourage a substantial volume of rental housing. An experiment with this idea, as projected, can do no harm and might prove beneficial. There is a question whether investment incentives for rental housing have kept pace with the enlarged incentives to home ownership that have been developed in recent years.

Any desirable features of Title IX, covering disposal of surplus war housing, can be enacted separately. There can be no objection raised to provisions for preference to veterans; provisions for sale to public housing authorities go beyond the previous intent of Congress as expressed in the Lanham Act.

In summation, I would say that many of the features of this omnibus Bill are highly objectionable for reasons that I have outlined. If long-term measures as comprehensive in character as those proposed in this Bill were needed, it would be quite impossible to draft sound legislation to cover all of them at this present moment, when the economic picture is so confused. The future housing needs and the future housing activity of the country will be determined by our future levels of prosperity and family incomes, and by future levels of rents and construction costs in a free market, factors which are quite unpredictable in the present stage of transition. If we did not already have ample facilities for financing residential building recovery, the situation would be different.

Consolidation of federal housing agencies should be considered by Congress in terms of the whole policy of the federal government respecting banking functions of the Federal Home Loan Bank Administration, the mortgage-insuring functions of the Federal Housing Administration, the capital-credit functions of the Reconstruction Finance Corporation and the functions of other federal lending agencies.

Specific proposals for amending existing housing laws or for initiating new governmental housing activities should be made in the form of separate bills rather than in an omnibus bill like S. 1592, which is extremely difficult for Congress to appraise adequately and critically in all its voluminous details.

THE Wagner-Ellender-Taft Bill — "General Housing Act of 1946" (S.1592) — was passed by the Senate on April 15, 1946. Hearings were started before the House Committee on Banking and Currency, but discontinued when Congress adjourned.

This Bill is an omnibus measure of 11 titles, 116 pages, 27,000 words.

Title I: would perpetuate wartime NHA over FHA, FHLBA, and FPFA; would thus concentrate policy making power for three divergent agencies in a single politically appointed administrator.

Title II: would appropriate funds for technical and economic research in housing, also for local surveys and planning.

Title III: would expand lending powers of federal S & L associations, liberalize FHA Title I and II programs; would provide for lapsing of principal and interest payments on FHA loans up to three years; would ask builder's warranty of construction for one year.

Title IV: would drastically liberalize FHA insurance with "special systems of mortgage insurance for families of lower income," contemplating "all proper incentives to cost reduction through . . . new materials, techniques and methods . . . and elimination of unnecessary restrictive practices . . ."

Title V: would provide for yield insurance by Government, administered by FHA, guaranteeing amortization and limited return to investors in multi-family housing.

Title VI: would offer grants-in-aid for land acquisition for urban redevelopment, the federal government to stand two-thirds of the loss in land costs.

Title VII: would authorize contributions for construction of public housing, involving \$4,000,000,000 of federal funds over the next 45 years.

Title VIII: would expand public housing in rural areas, through the Department of Agriculture, involving \$1,125,000,000 of federal funds over the next 45 years. It would also authorize the Secretary of Agriculture to furnish "without charge or at such charges as the Secretary may determine, technical services such as building plans, specifications, construction supervision and inspection . . ."

Title IX: would give preference to veterans in the disposition of war housing.

Title X: would provide for an annual inventory of housing, with recommendations as to future programs.

Title XI: legal miscellany.



"WE WILL BUILD MODERN CHURCHES"

By John W. Ragsdale, Associate Editor

ARCHITECTURAL RECORD'S

BUILDING TYPES STUDY NUMBER 118



WHEN we build again, the war being ended, we will build modern churches. We will take advantage here, as in every other field of . . . new materials . . . new methods of construction . . . new planning techniques. We will deny to the Church no serviceable instrument, whether it be a machine or a new form of shelter which we are able to give Her; nor will we think that the imagination and invention, the surprise and daring of a new architecture are uncongenial to the Christian spirit."

So wrote Joseph Hudnut* in ARCHITECTURAL RECORD, September, 1944. Human building, at the time, in every enlightened field was much in eclipse to the stupendous pervasion of total war. But the right side was winning. "Imagination and invention" would soon be free to build, as well as new churches, an entire new world, unified by a new spirit; or, perhaps, to reshape a new and better international form out of the old pieces, in which a strong binding element would be the reaffirmation of an ancient ideal — a new moral and political "architecture" of nations, "not uncongenial to the Christian spirit."

"When we build again, the war being ended . . ." In September, 1945, the war being ended, Walter A. Taylor† writes in the RECORD: "Whereas 15 years ago 'shop talk' among ministers was about Sunday School methods, and a decade ago the emphasis was upon week-day programs of social, recreational and community service activities, today . . . ministers . . . are reading, writing and talking about what they can do to 'vitalize' their services of worship." (For all the worthy effort between wars to make the Church a more vital and influential factor in Christian living, through increased social and recreational activities and intensified religious education, something still was lacking — acutely realized during and at the conclusion of the greatest war, we hope, in human history.) Mr. Taylor goes on to say: "It is now realized that neither the social hall nor the Sunday School, but rather the Sanctuary, is the power house which activates the whole insititution."

Shortly before undertaking this Building Types Study on Churches, in August, 1946 — the war being ended one year — RECORD editors received from Jean Labatut‡ a critical estimate of a particular building (not a church) which concluded with the following general statement: "Perhaps all this indicates that architectural expression corresponding to the needs, demands and means of today is not yet 'around the corner,' and that the

chaotic architectural expression in which we live is due to an abundance of physical means and a paucity of intellectual, spiritual and moral qualities." We wondered if, in his regard, churches — being planned and built today with the war being ended one year — were a part of "all this" indicating "chaotic architectural expression . . . abundance of physical means and a paucity of intellectual, spiritual and moral qualities." Unhappily, he declared, in many cases churches are, indeed, a part — a great and tragically significant part. Much too frequently they express the essence of the confusion, the fumbling, the double talk, the misunderstanding, the mistaken aims, causing the abundant fragments of old orders and new visions to be booted and scattered further, or else jumbled together in heart-rending flummery, not only on earthly plots but at peace conferences — and the war being ended one year!

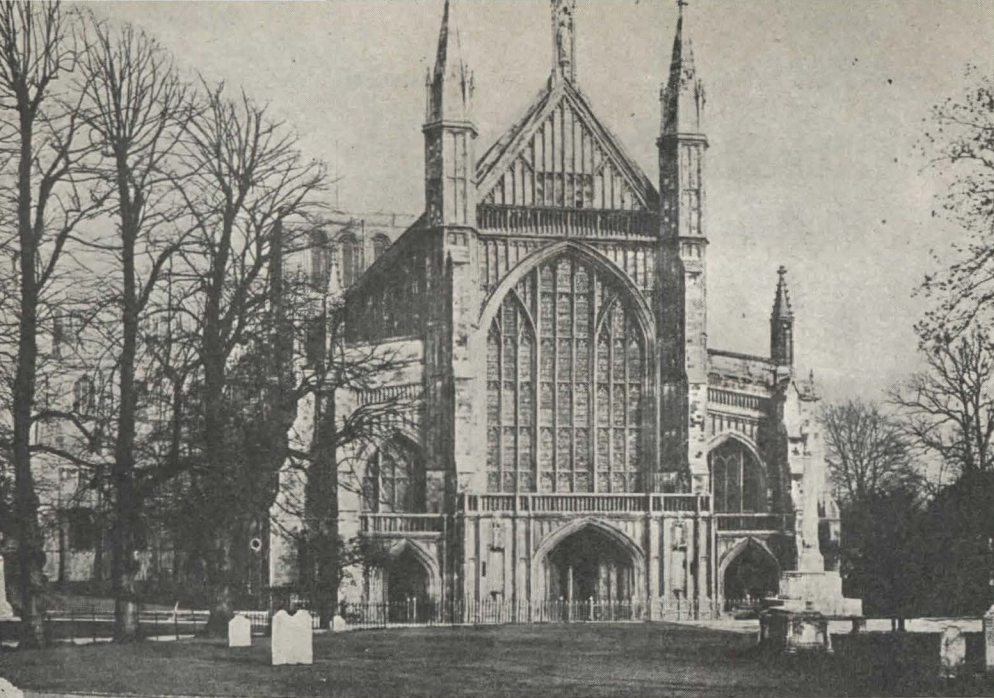
In 1900 Ralph Adams Cram looked upon American ecclesiastical architecture and was unhappy.§ For the most part all that he saw was regrettable, from the proliferation of country churches — "wholly bad in shape and composition . . . doubly hideous through the arched windows, the silly wooden buttresses, the futile belfries and pinnacles" — to the variegated ugliness and paltriness of the village (or parish) and city churches, and the three or four American cathedrals. He called for a triennial conference of church architects and clerical and lay members for a thorough discussion of the whole question of art in relation to the Church. He was convinced that in such a conference "one decision would be reached unanimously . . . to take up the architectural life of the Church where it was severed in the sixteenth century and carry to its logical and glorious development the work begun by William of Wykeham, Bishop of Winchester. Our present chaotic methods, Romanesque and Colonial, Italian and French Renaissance, the early Gothic of France and Germany, Spain and England would be abandoned." Build American cathedrals, he besought, in the "one style, and one only, that is for us . . . the English Perpendicular" and from these splendid examples all the lesser edifices — in town and village and country — must inevitably take their inspiration and in their lesser character truly reflect and eloquently communicate the Christian spirit.

* Dean of Graduate School of Design, Harvard University.

† Professor of Architecture and History of Architecture, Syracuse University. Consultant to the Interdenominational Bureau of Architecture.

‡ Professor, Chief Critic of Architectural Composition, Princeton University.

§ "Church Building." A study of the Principles of Architecture in their Relation to the Church.



Courtesy: Metropolitan Museum of Art

Winchester Cathedral, West Façade:
 “. . . the one style, and one only, that
 is for us . . . the English Perpendicu-
 lar.” After 25 years and a world war,
 Ralph Adams Cram discovered a broader
 basis for the “new fabric of religious
 architecture” . . .

Most readers undoubtedly are familiar with Cram's words, and perhaps his feelings. Perhaps many have also contemplated the majesty of Winchester Cathedral and have likewise been moved before the West Façade “to strive to get something of *that* into my own work in my own day.” But most readers also know that there *was* a Reformation, that the Roundheads *did* march into Winchester Cathedral during service, “with colors and drums, doing irreparable damage,” that we *are*, inescapably, the inheritors as well of the dissident tradition expressed in England by Wren and Inigo Jones and Gibbs, who “could not build churches, though they did.” Cram in 1900 might deplore our colonial examples as “only crude imitations, without any artistic value whatever, and precious only from an historical standpoint.” But they *were* History! He might also, in 1900, set himself further against history by proclaiming that the Church of St. Mary the Virgin in New York City, though it had “the height and the simplicity of mass that were necessary,” was yet “erected after an evil fashion, falsely and unpardonably, with a frame of steel like an office building, supporting the sheathing stone that was worked into the forms of honest construction . . . an example of all that should be avoided.”

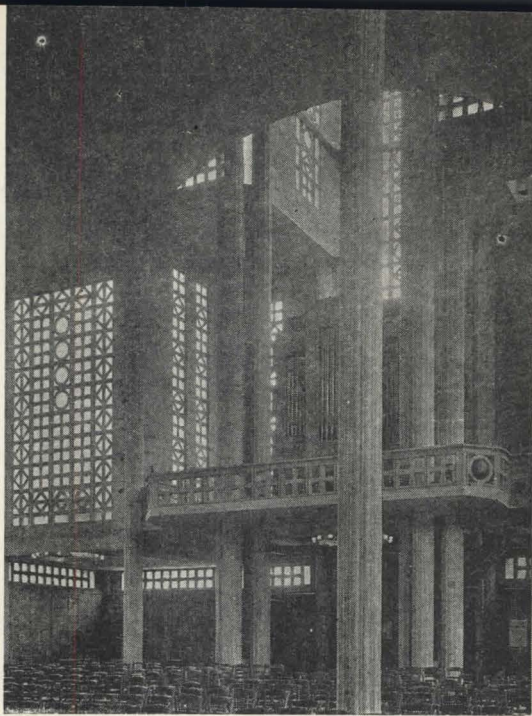
In 1923, the war being ended, Ralph Adams Cram added to his manifesto a postscript, stating “There is nothing in the earlier editions the author would retract . . . unless perhaps it were the rather narrow enthusiasm for the latest phase of English Gothic as the sole basis for the new fabric of religious architecture. . . . Perhaps religion seems less national, less racial than *once it did*, and so essentially more catholic as well as Catholic. . . . The more one studies these arts, the more at one they seem in all their underlying principles, and all touched with some divine beauty . . .” And further: “If the craze for high buildings continues, city churches must be content no longer to dominate their surroundings, but rather to call men through their contrast . . .” And in final summary and conclusion: “It is not that the church building today (the best of it) is so much in-

ferior in point of design to . . . Bourges, Lincoln, Seville. Where it fails is in what the architect cannot give and that is *life*. . . . I am not arguing for a ‘new style’ in the sense of . . . something . . . anarchical in its impudent defiance of law and precedent, cut off from all continuity of succession and answering to nothing in the real life of society, like . . . cubist sculpture . . . cacophonous music and *vers libre*. . . . Each new thing is fathered by its antecedent, if it is legitimate. It may be, in its maturity, far different in personality to its progenitor, but the inheritance is there. Chartres is the triumphal son of Caen, the father. . . . When religion regains its past vitality and marks this by a restored unity, then it will be content neither with the anarchic and amorphous monstrosities . . . nor yet with the thoughtful and scholarly restorations . . .”

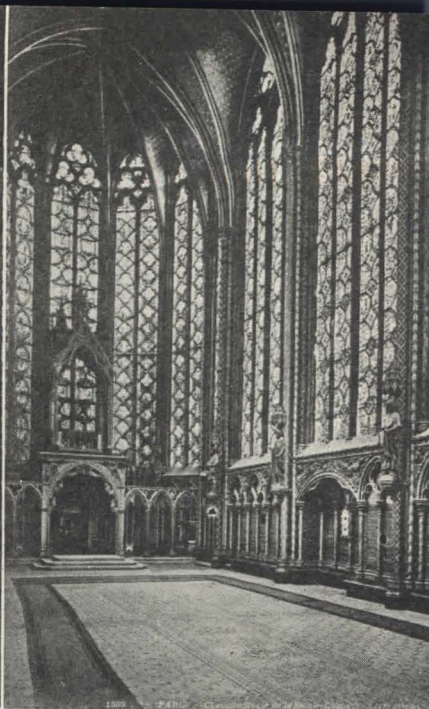
And so in October, 1946, how do things stand with the Church? What evidence is there of *life*, of “vitalization”; what prospects of new and better forms issuing from the legitimate parenthood of the past? In the first six months of the year, more than 900 church construction projects, to cost \$37,160,000, were reported by Dodge services. And in just *one* recent month, 331 new projects were reported in the actual planning stage, valued at \$27,170,000! Certainly this is heartening testimony to the presence of strongly pulsing life *blood*, at any rate.

But how is this life blood to be incorporated? Two years ago Dean Hudnut prophesied: “Progress will be first evident in the interior. There the ceremonial is unchanged and yet is re clothed by each generation according to its spirit. The ancient symbols will remain—altar, choir and central aisle—but not the heavy pillars, the complicated vaults, the dim religious light. A simple room, Greek in its clarity, with quiet walls and clear light.” And by a legitimate transitional process, not anarchical or impudent in defiance of tradition and precedent, “the simplicity and quietude of the interior volumes will be reaffirmed in the exterior shapes.”

Far right: Sainte-Chapelle, Paris. Right: Notre Dame du Raincy, A. and G. Perret, Architects. "Each new thing is fathered by its antecedent . . . It may be in its maturity far different in personality . . . but the inheritance is there."



ALBERT MORANO Photo (Courtesy Museum of Modern Art)



Courtesy: Metropolitan Museum of Art

Charles D. Maginnis, F.A.I.A., writing in the same issue of the RECORD with Dean Hudnut, believes that: "In a world of disconcerting and dramatic change old ideas are expected to make submission. Nevertheless, the Church is an institution that may in complete propriety choose its own accommodations. No interest is more removed from the hysterical importunity of novel principles. It will come to its rightful authority in American art by holding in a spirit of moderation to a sense of its independent mission, rather than by a deflecting course which involves the violent disqualification of history."

And again in the same issue, Brother Cajetan Baumann, O.F.M. says: "A certain change of attitude is taking place, a marked influence toward greater simplicity. . . . All else must be subordinated to the altar. The eye and the mind must be led immediately towards it. . . . There is a current tendency to bring the church closer to the public; to erect smaller churches but a greater number of them. . . . A proper setting gives the church both repose and dignity. . . . To attain respectable quiet, sound-deadening insulation and air conditioning are essential in planning the modern city church. Every means for making it clean and quiet, healthful and tranquil should be specified."

Walter A. Taylor concludes his remarks in last year's study by saying: "The designer who has a decent sense of the inherent dignity of the church can work over the basic patterns with the greatest of freedom, with completely non-traditional detail. . . . If it fulfills the relatively simple functional requirements, and is also the kind of place which, even when empty and silent, causes the man on the street to take off his hat upon entering, it will be a Church."

Professor Labatut supports Mr. Taylor's argument for primacy of the Sanctuary, and achievement of the sense of spiritual immediacy as foremost in objective, with an account of the 1937 Exposition Internationale at Paris. To him the experience of stepping out of the galaxial concentration of technology on parade, into

the Pavillon Pontifical, with its exhibit of *autels* and religious objects was as immense and inspiring as anything in his memory. So effectively were modern principles of shelter and exposition adapted to the highlighting of altars and sacred art that reverent awareness was as manifest in visitors to the Pavillon as in pilgrims to Chartres Cathedral. (This writer, too, has felt the tremendous spiritual impact of Chartres; and recollects suddenly that equaling — perhaps even surpassing the experience — were a few moments in a pine woods, before a portable altar covered with a white table cloth and the simplest of sacred objects, set up by an army chaplain in the presence of several hundred frightened men.)

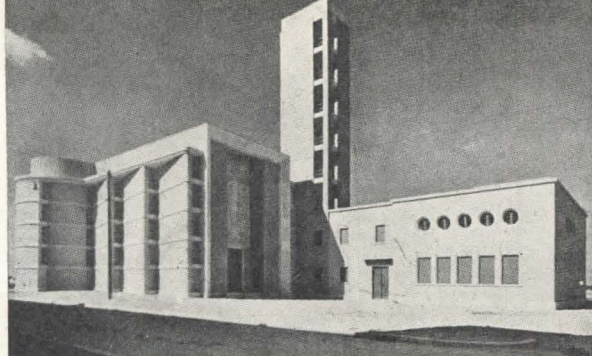
Professor Labatut gives counsel to many architectural students who come to him desirous of "doing" a church. He guides them, first, in simply the practical considerations imposed by chosen locality, site and denomination, number of congregation to be seated, services and activities to be included. Some return after protean thrashes on their own with questions of Style and Tradition and Precedent and avow, as indeed did one, that in their final determination the best church "was a good radio in a man's own living room." For all the superficial warrant of such a statement, there must somehow be induced in these students an awareness of the true and indispensable meaning of "Church." If such cannot be done, it is only by extraordinary happenstance, he believes, that they will ever design a successful one.

Other students want to do a "modern" church immediately, forthrightly and fearlessly. One such, for a small Catholic chapel in Ireland, adapted the concrete parabolic arch to an interior that, through sensitive and intelligent handling of the Sanctuary, was quite successful. A satisfactory resolution of the exterior, however, persistently eluded the student, dissatisfied with its starkness yet determined not to compromise his over-all principles in any egregious way.

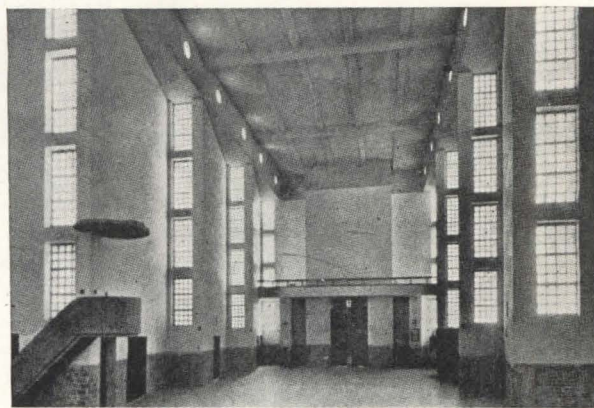
It happened, relates Professor Labatut, at that time



Above: design for a city church; W. H. Thomas, Architect; H. E. Wagoner, Associate Architect. "An attempt . . . to maintain dignity and importance in surroundings with which the Church cannot hope to compete in size." Right: a use of similar window technique in the Church of St. Michael the Archangel, Foggia, Italy; C. Petrucci, Architect.



"L'ARCHITECTURE D'AUJOURD'HUI" Photos



a Gothic doorway belonging to a bishop's house of the *ancien régime* was much in the news, being energetically sought after by the Rockefeller Foundation. It was not, finally, to be removed from its original French location, but "suppose," he asked the student, "that you had this doorway to dispose of — would you put it in a museum?" It was inserted in the plan for the parabolic chapel, the area between it and the concrete arch filled with glass, and the result — in the opinion of both student and mentor — was a striking acknowledgment of the modern form's genuine and undeniable connection with the tradition and spirit of the past.

Valid new "styles" that modern church building may eventually achieve are only conjecturable to Professor Labatut. There are discernible, he believes, numerous hopeful evidences and indications. For example, he is able to show as graphic supplement to his lectures, lantern slides favorably comparing the interiors of *Sainte Chapelle* and *Notre Dame du Raincy*, by the Perret brothers. (Says Charles D. Maginnis: "After twenty years of weathering, the exterior of *Le Raincy*, however, confirms the idea that the virtues of concrete are best concealed.") *Le Raincy* is further significant to Professor Labatut in that it was achieved as the result of a competition — the winner in a final selection against three or four "traditional" entries, each to cost in the vicinity of four or five million francs. To a devout group of parishioners, *Le Raincy* was not only a thoroughly successful and manifest Church, but had further appeal to essential Gallic nature: its cost in estimate and in final figuration was near *one million francs!*

In general Labatut believes with Hudnut that new methods, materials and planning techniques will continue along the lines of successful indication, with "imagination and invention, surprise and daring" based on rediscovered concepts of Church "vitalization" and spiritual immediacy, toward a "new" architecture cloth-

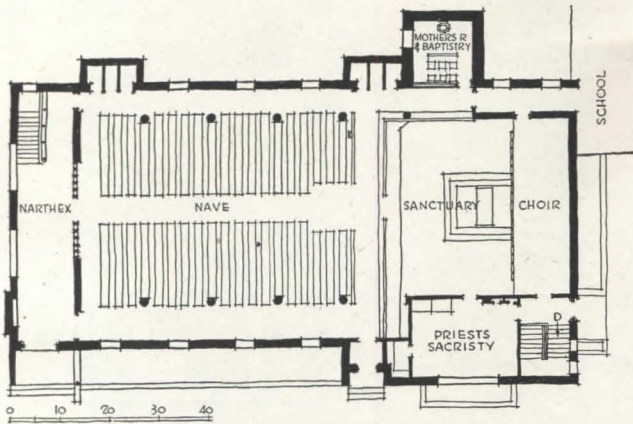
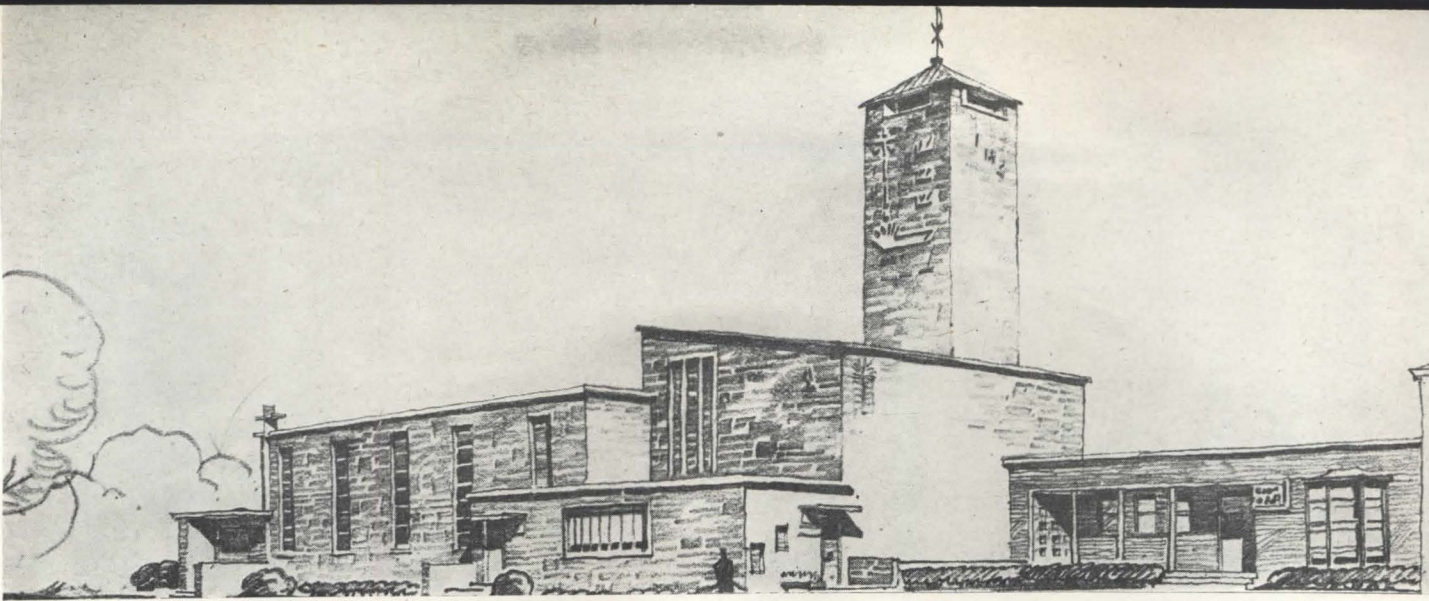
ing and sanctifying and proclaiming both Christian ideal and new international order. And it will be done in "transitional" concatenation with essential precedent and tradition of the past, not in a way to trammel and restrain, but respecting and revealing, rather, the unseverable continuity of historical spirit and faith and aspiration from Gethsemane to Lake Success.

He hopes to see certain tendencies relegated to other more appropriate media than churches — such tendencies as: "cubistic architecture based on *abstract equilibrium of matter*, as is possible in painting or sculpture and even building of very small size; functionalism expressing the *physical aspects of man's nature* to the subordination and even exclusion of his intellectual and spiritual qualities."

He hopes to see more successful integration with nature — more effective usage of site and natural surroundings, in the case of rural and suburban churches. In town and city, leave mere "gigantism" to factory and office buildings where great and unobstructed working spaces are functional dictates. Let the Church try rather for its effect through considerations of contrast, sanctuary, and spiritual awareness and compulsion.

Let illumination also prevail again as a strong and pervasive ingredient in architecture — *natural illumination*, the plastic interplay of light and shade on the *outside*, in the air and sunshine. "Do you recall," he asked, "how the New York Fair — the 'World of Tomorrow' — really only came alive and splendid after nightfall?"

Architects, for they are notably men of good will — and in this he is confident — will indubitably achieve new and true forms for sheltering and expressing the Church, the Church of a religion which must, indeed, seem "less national, less racial than once it did," in a world which has started building again — the war to be ended forever.

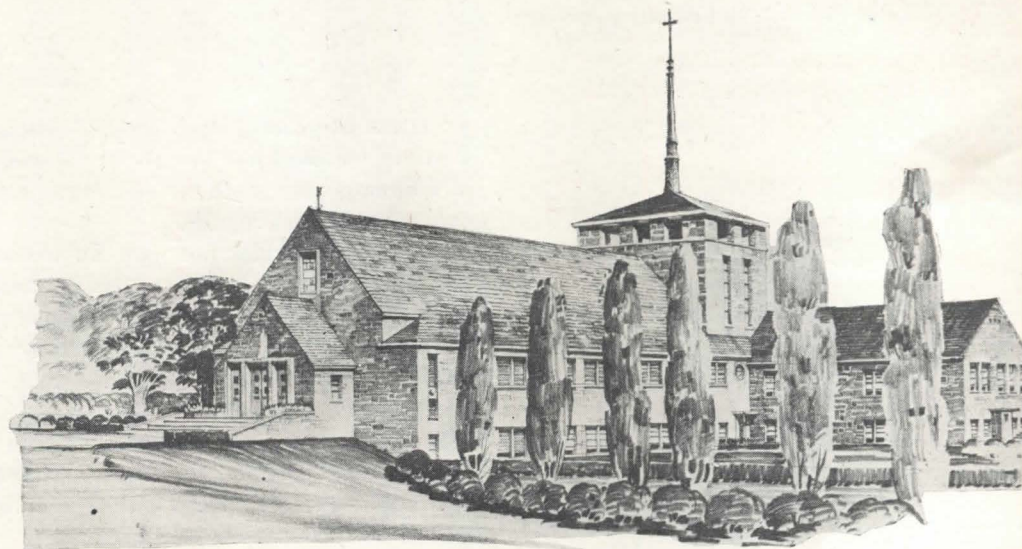
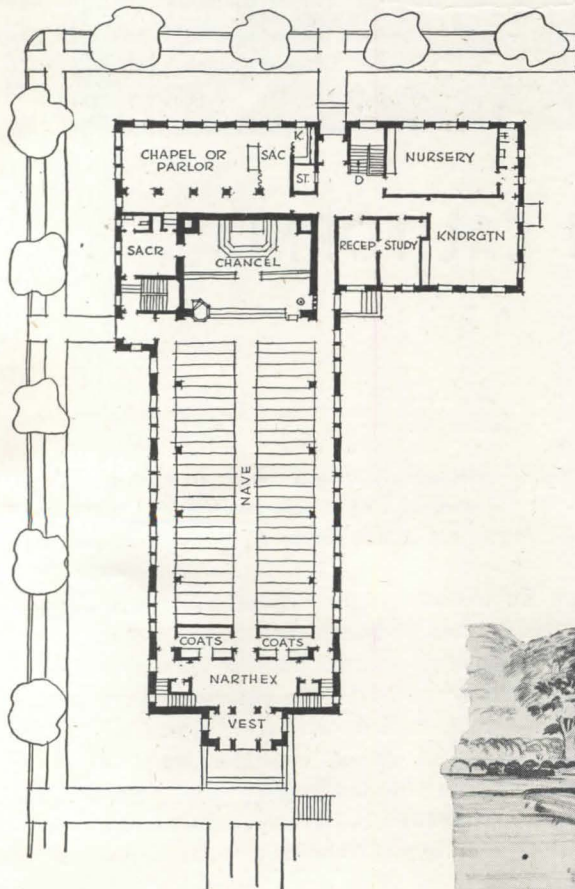


MINNESOTA CHURCHES

Hills, Gilbertson and Hayes
Architects

THESE two examples in Minneapolis are the latest results in this firm's program to "create churches rather than replicas" through "simplicity of design, without sacrifice of appropriate dignity, permanent materials or smooth functioning of plan." The Church of the Holy Childhood (above) is planned for the rim of a plot 11 ft. below level of the street serving both church and present adjoining school. Plan permits functioning of social hall beneath church in connection with lower-level parking and recreational areas. Other features are: choir at rear of Sanctuary; combined baptistry and mothers' room in tower; an altar permitting celebration of Mass from either side.

The Lake Harriet Lutheran Church (below) will also be built on a plot much lower than street level permitting similar function of a fellowship hall beneath the nave. "In the interests of economy, the chapel will double as a parlor. The rather low lines of the nave will be relieved by termination in a lofty, well-lighted chancel."





METHODIST GROUP IN CALIFORNIA

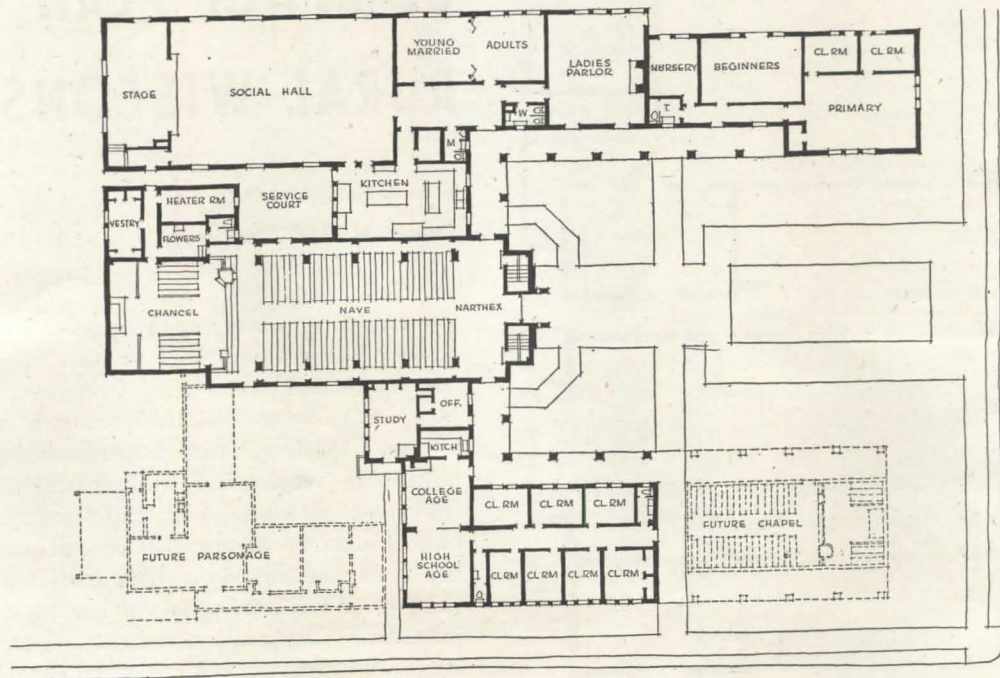
Vincent G. Raney, Architect

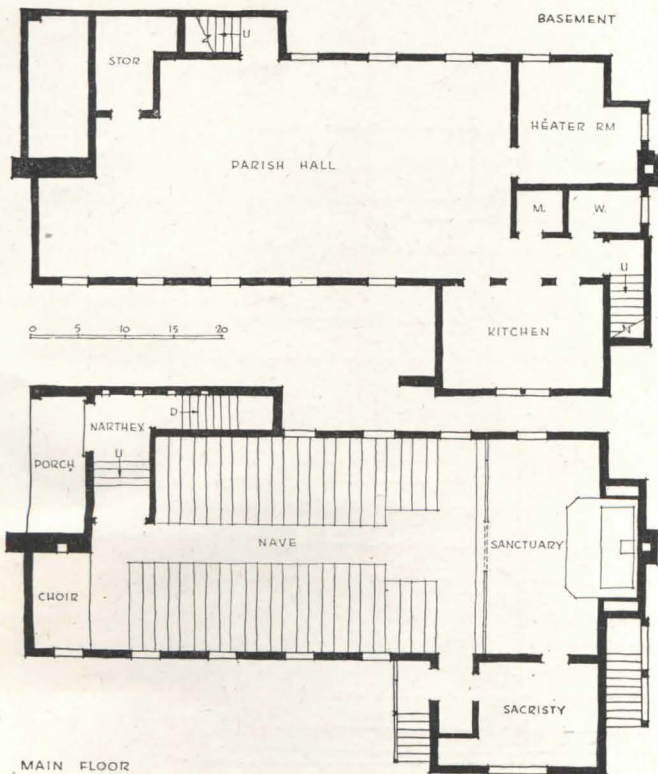
George P. Simonds, Consulting Architect

IN TIMES of general stricture and shortage, the architects, in this building group for the First Methodist Church of Petaluma, have made the most of contemporary methods and materials available to them for housing an extensive parish program.

The plan provides not only for a wide range of social and recreational activities, but also permits considerable divisional and departmental concentration in the conduct of religious education. In this connection, the future chapel may serve as a "worship center" in the educational program, as well as for the usual special services. A distinctive feature of the plan is the provision adjacent to the Chancel of a room equipped with sink and other facilities for keeping and processing flowers.

Construction is frame and stucco; lightweight tile roof; cement sub floors, with asphalt tile covering. Walls and ceiling of nave are acoustically treated.



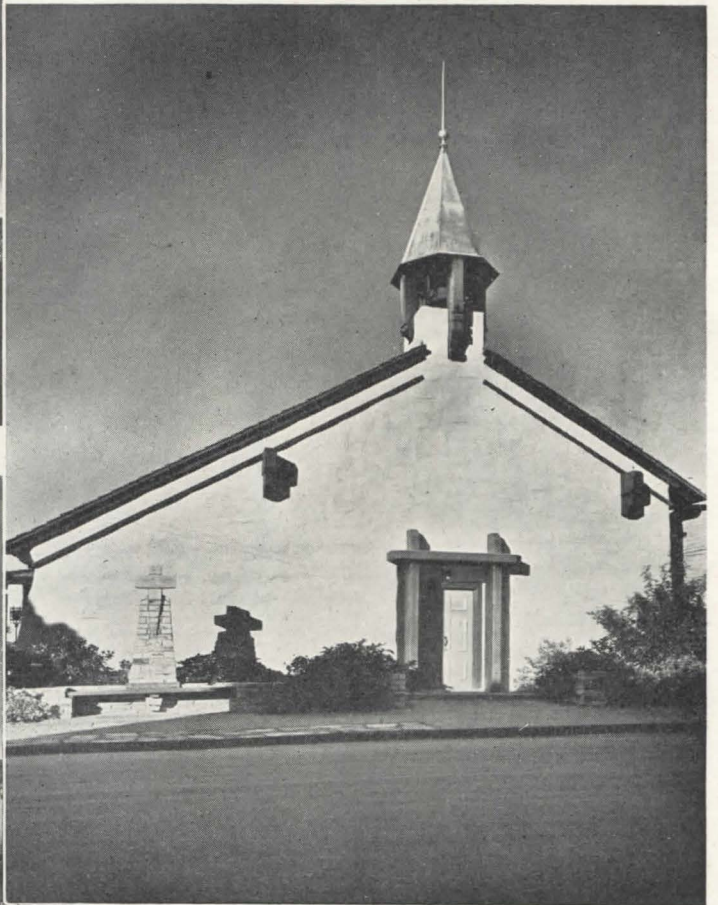
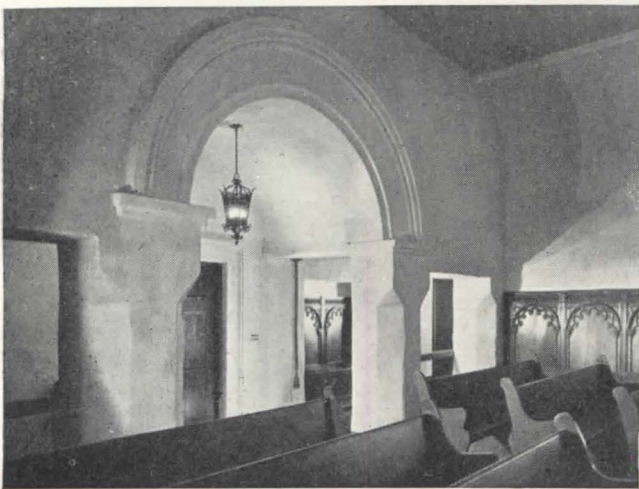


COMPACT PLAN FOR RURAL WISCONSIN

John J. Flad, Architect

Thomas H. Flad, Associate

CONFINED by an extremely modest budget, the architect has yet contrived to meet all requirements of committee and pastor with a compact and distinctive plan for this small Catholic church on a Wisconsin hilltop. Tightly planned features are: narthex serving both nave (seating 130) and parish hall beneath; altar framed simply in east wall; confessional in sacristy vestibule. Further economy will be achieved with common brick on the exterior, stock size wood sash, wood shingles. Roof framing is wood truss; main floor, steel joist. Sub floors are concrete, asphalt tile covering. Interior walls, plaster; ceilings, wood paneling.

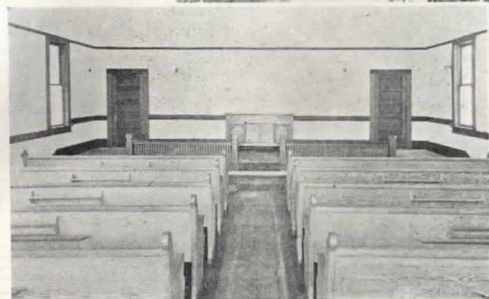


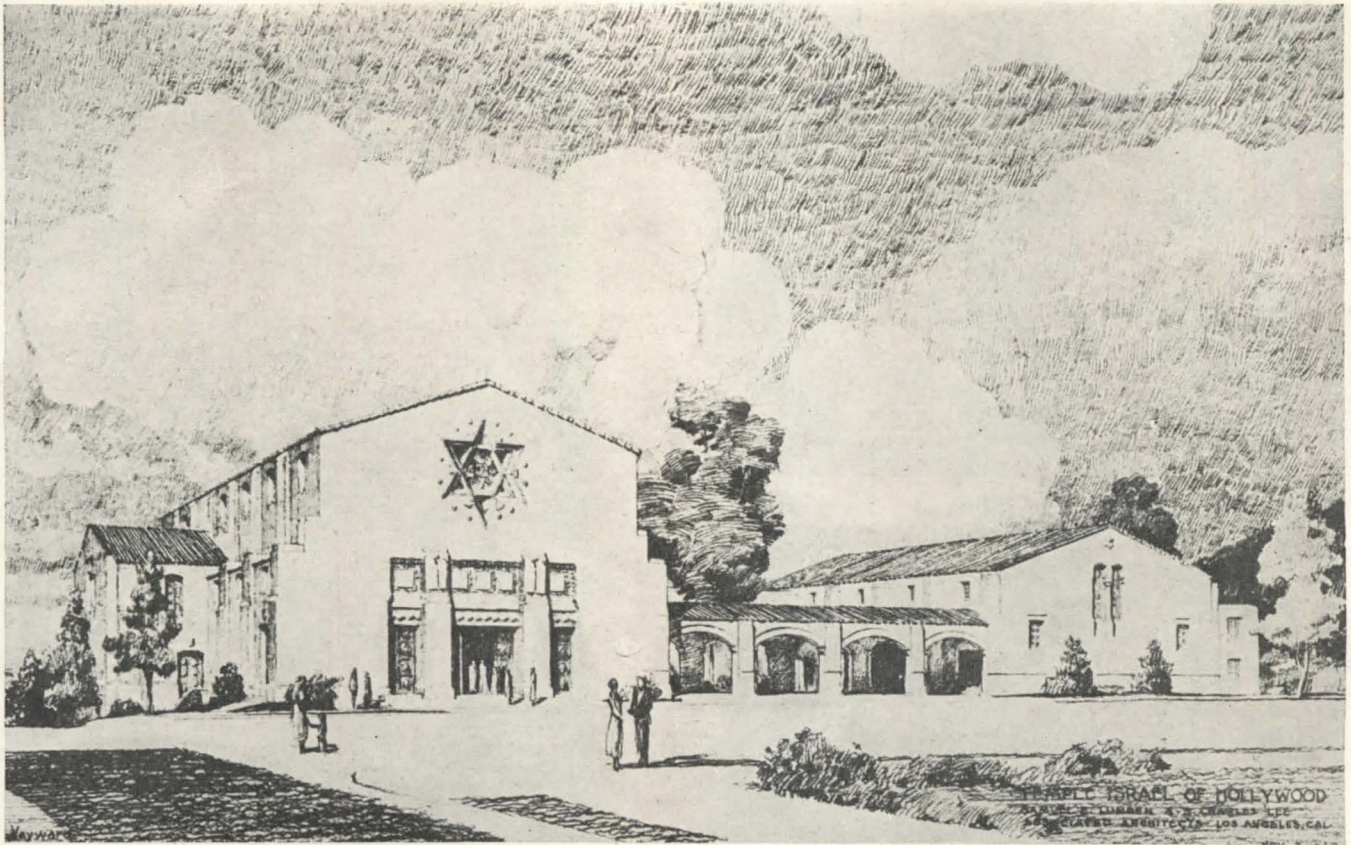
MAYNARD PARKER Photos

NEW CHARACTER IN OLD FRAMEWORK

Robert Stanton
Architect

EFFORT toward "vitalization" and a new approach to the sense of sanctuary and spiritual immediacy are evident in this remodeling of the Community Church at Carmel, Calif., to be called in its transformed character, "The Church of the Wayfarer." Moreover, the architect says, "It would have cost the congregation \$25,000 to remove the old building (right) and erect a new one. We were able to remodel it for \$17,000. New paneling and pulpit are of antique walnut purchased from an estate in southern California, having come originally from a Bourbon castle in Italy." The old pews were retained and treated to harmonize.



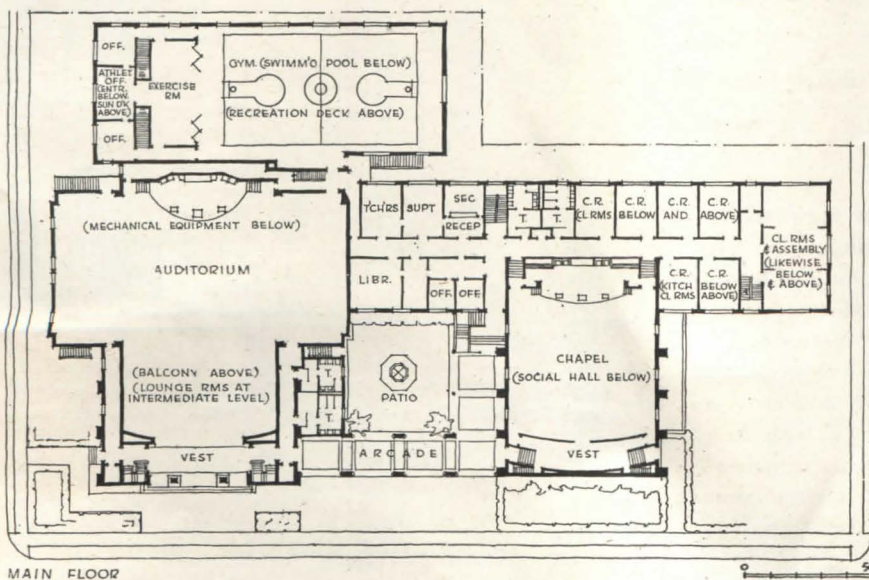


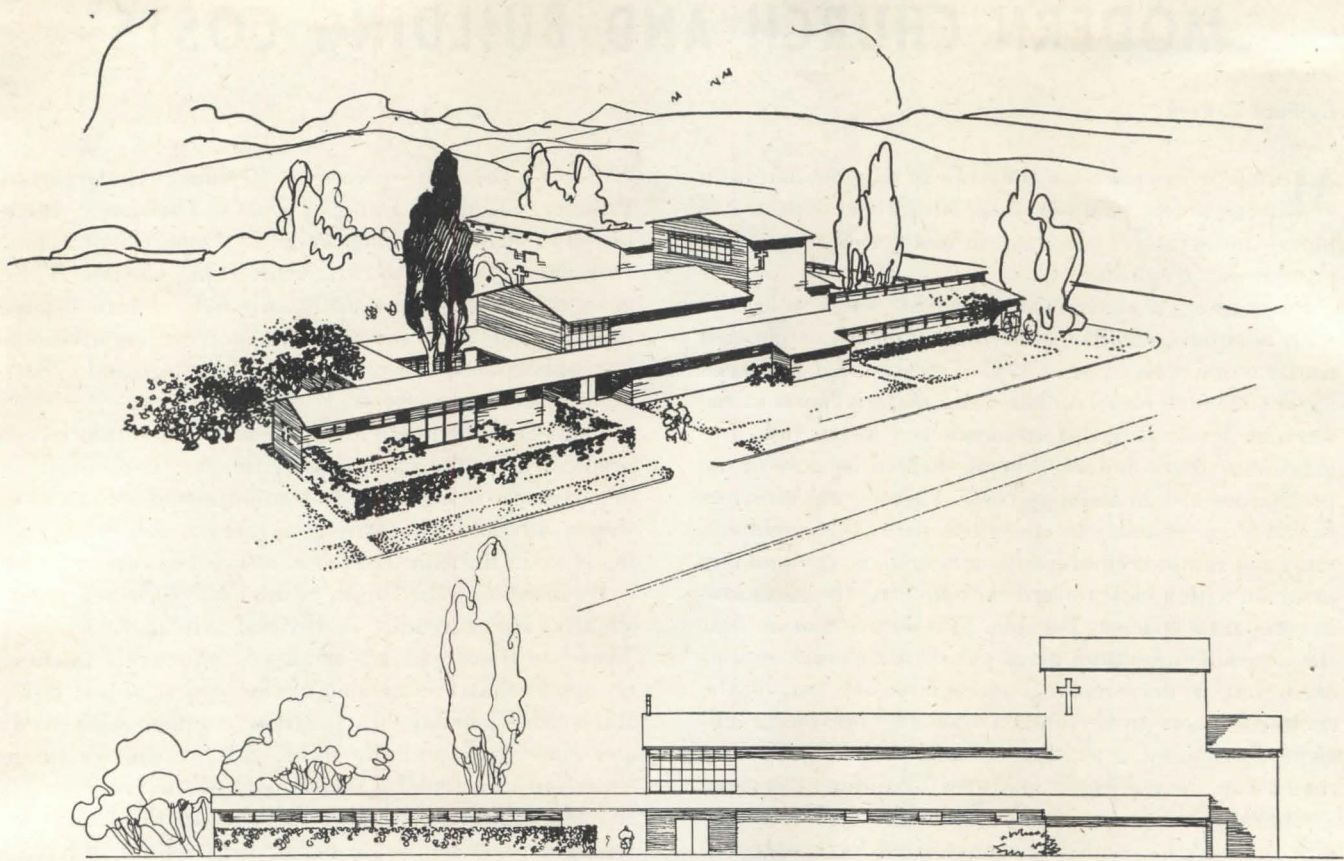
CALIFORNIA SYNAGOGUE IN MISSION TRADITION

Samuel E. Lunden and S. Charles Lee
Architects

IN GENERAL appearance, Temple Israel of Hollywood indicates extension of previous tendencies into post-war stages. In the past, American synagogues have tended to conform with prevailing regional patterns of religious architecture. In this case, however, conformity with mission influence has stopped well short of a bell tower extraneous to essential tradition of this faith.

The plan provides generously for social and recreational activities, always paramount functional considerations in synagogue planning. Curvilinear seating is in line with standard practice for bringing congregations into close relationship with Ark and Alemar.

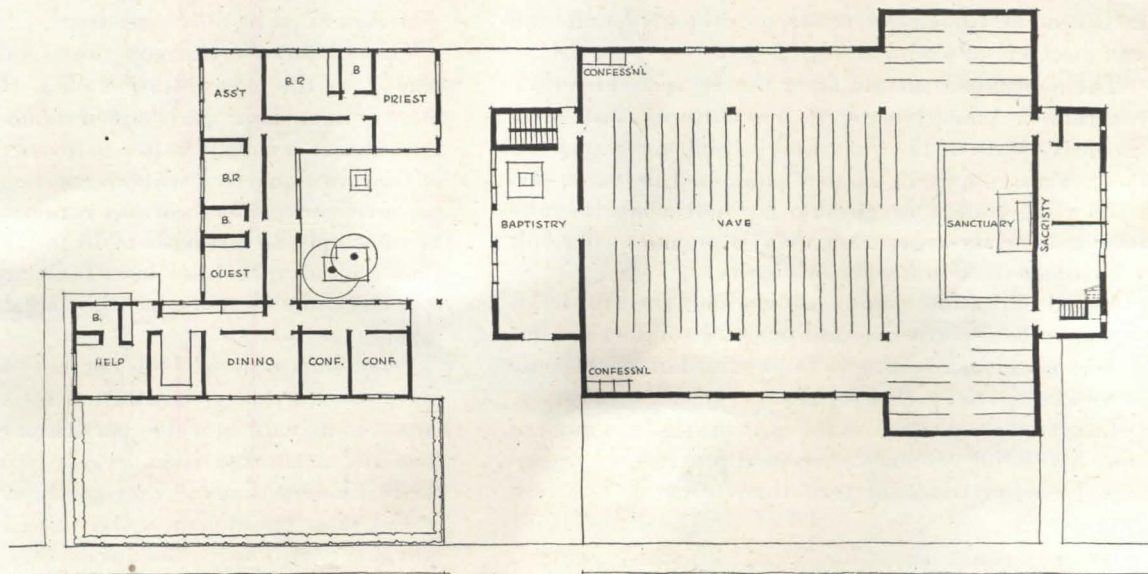




PAUL THIRY describes the general design of this proposed group of parochial structures, for a rural community near Seattle, as "contemporary, using as inspiration certain applicable techniques of the early missions of the Southwest." The first unit of the group will be church and rectory shown above in elevation and below in plan. Special features of the church are: extra wide side aisles for shrines, Stations of the Cross, etc.; large sacristies behind Sanctuary, with space above them for male choir; balcony over entry for mixed choir. Future units of the group will be an eight classroom school, social hall and teachers' residence.

PAROCHIAL GROUP IN THE NORTHWEST

Paul Thiry, Architect



MODERN CHURCH AND BUILDING COSTS

By Paul C. Ruth*

MODERN conceptions of the scope of religious activities force a new analysis of the structures expected to house the extensive program, in new terms recognizing present-day conditions.

So great is the movement to provide religious leaders with adequate facilities that the aggregate of planned construction was, even in 1944-45, estimated to exceed \$3,000,000,000, based on labor and material costs at the wartime level. But this tremendous construction program is in grave danger of being shelved because of the precipitous rise in building costs. Pastors and directors of religious education, together with the architect, must re-examine requirements and analyze the building program with a view toward consolidating the plant into as compact a space as possible. This does not mean that the desirable minimum areas per person should be lessened, but it does mean a more intensive use of the enclosed spaces to be built. To achieve maximum efficiency, proposed activities must be so scheduled that rooms may be used over and over by different groups.

Church planners must more than ever before recognize the folly of specifying a nave sized for Easter and Christmas. Two services per year must not impose a 50 per cent increase in seating capacity over normal attendance. It is recognized that many pastors are desirous of large naves, for other reasons. Granting that their preaching is dynamic enough to fill the proposed structure, there is no assurance that such force will be perpetual or that the pastor may not be called to another charge. A far wiser plan is to have multiple services which, although increasing the preaching load, does not place the burden of an expensive and lightly used plant on the congregation.

The first step, undoubtedly, toward economical building is re-appraisal of architectural styles. "Archeological" types certainly are not economical to build. In order to have substance to their being, stylistic exercises in Gothic or Colonial depend on antiquated materials and methods of workmanship.

The new church should favor the use of architectural concrete or precast concrete units. Roofs, instead of expensive slate or tile, may well be built-up gravel surfaces. Trusses may be factory laminated units, or plywood rigid frames or girders. By borrowing liberally from industrial construction, many economies will result without sacrifice in beauty or dignity.

Visual education, sound distribution, cheerful lighting, acoustical correction and physical comfort are but a few additional advantages to be gained at the expense of unproductive "period designs."

Intensive use of space is the next principle in modern church building economy. Accepted practice has organized the church school into three general divisions:

Children's Division — Nursery, Beginner-Kindergarten, Primary, Junior; *Young People's Division* — Intermediate, Senior, Young People's Department; *Adult Division* — Young Adults, Adult Bible Classes. These general divisions are usually sub-divided into departments as indicated, the over-all plan requiring divisional assembly rooms for worship and fellowship, and departmental classrooms for study and discussion.

Plans described above have generally heretofore been predicated on the various activities in the divisions or departments being carried on simultaneously; i.e., worship, study and fellowship activities of each group taking place in the same sequence in their respective rooms.

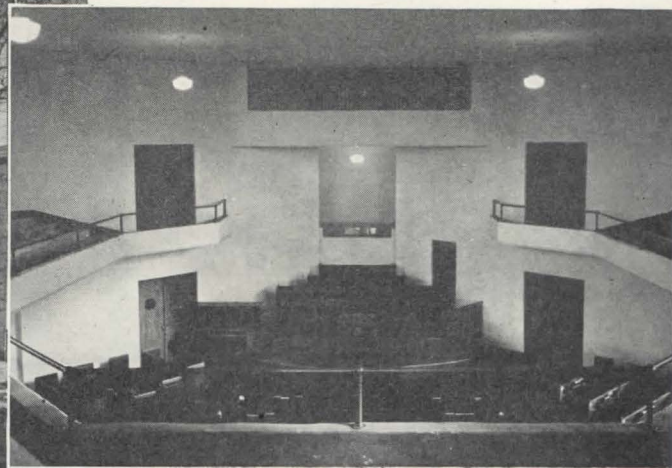
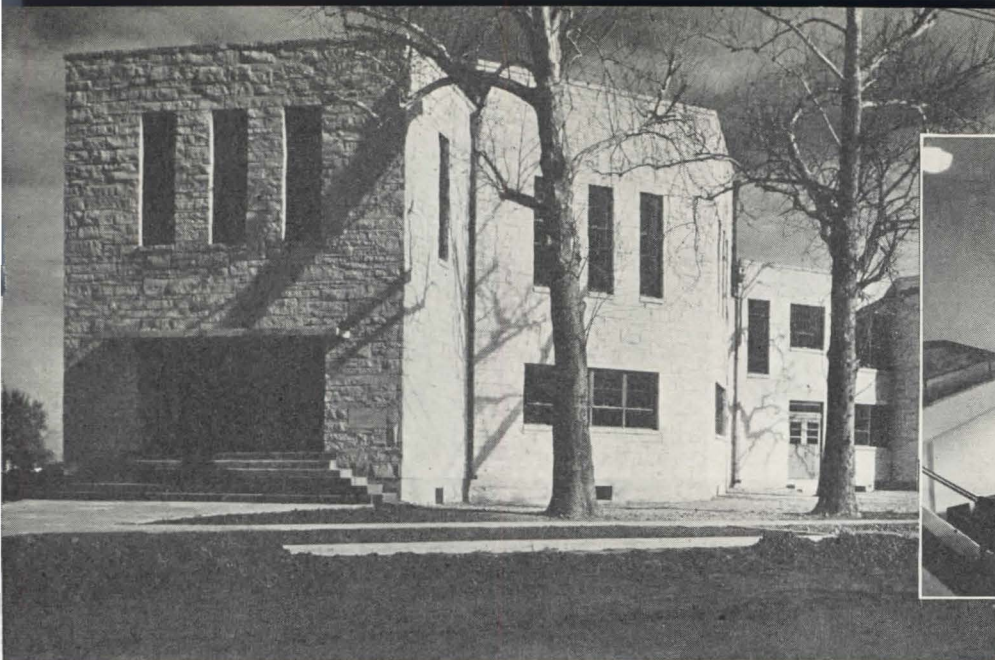
By increasing the length of the Church School period slightly, it can readily be divided into three sections. These sections will be arranged among the various groups so that the opening of the session of one group starts with a fellowship program, another with study and class work and the third with worship or junior church in the chapel. (A vital part of the program is a chapel suitable for worship services. In the Children's Division the assembly or department room can have a "worship center" readily convertible to secular purposes. In the Young People's and Adult Divisions, however, a real chapel is essential.) Allowing twenty minutes for each section and five minutes for change, the usual hour program is merely lengthened by ten or fifteen minutes. At the end of twenty minutes there is a rotation of the group to the next phase of the program, and twenty-five minutes later another rotation. This permits triple use of the same room with only one-third the size of the plant ordinarily required.

The architect adopting such a scheme must carefully check the routing of traffic at the change period. Traffic should flow naturally in one direction without crossing, requiring two means of entrance or egress from all rooms. In determining full space requirements, weekday activities must be duly considered.

The Children's Division does not adapt itself as readily to this concentration plan. Because they feel more at home in properly scaled rooms with small furniture, etc., it is usually better to house the small children in their own quarters, without rotation. It is also better to have convertible worship centers, and plan these rooms amply on the basis of 18 to 25 sq. ft. per pupil. Children's chapels have been built and are advocated by some church leaders, but they are definitely a luxury item.

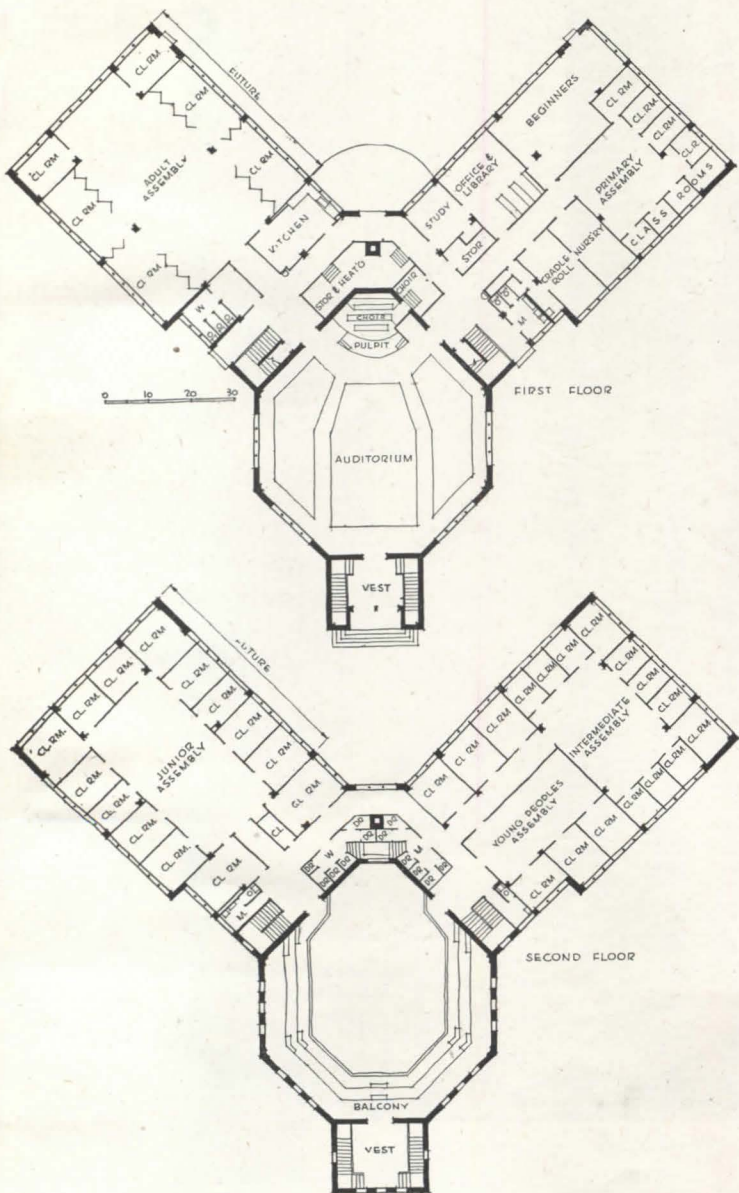
Fellowship or parish halls regularly serve a number of purposes. Further concentration by subdividing these large rooms with movable partitions or curtains is unwise and most unsatisfactory. At best they are inadequate dividers of space; they are expensive and require considerable maintenance. Only as a last resort should movable partitions be used in flexible planning.

*Of the architectural firm, Conrad, Hays, Simpson & Ruth, Cleveland, Ohio.



"POORBOYED" BAPTIST CHURCH

Arthur Fehr and Charles Granger, Architects



THIS congregation (Luling, Tex.) suffered a total fire loss," write the architects, "on Easter Sunday, 1939. Therefore in thinking of a new building they aimed at a maximum of fireproof quality, in addition to as much building as possible for their limited funds.

"After studying their requirements, we came up with the plan as shown. It was not too difficult to convince the church group that simple basic construction methods would result in a more economical and a more progressive architecture. Luling is a town of 4437 people and every other church in it is bastard Greek, Roman or Gothic 'inspiration.'

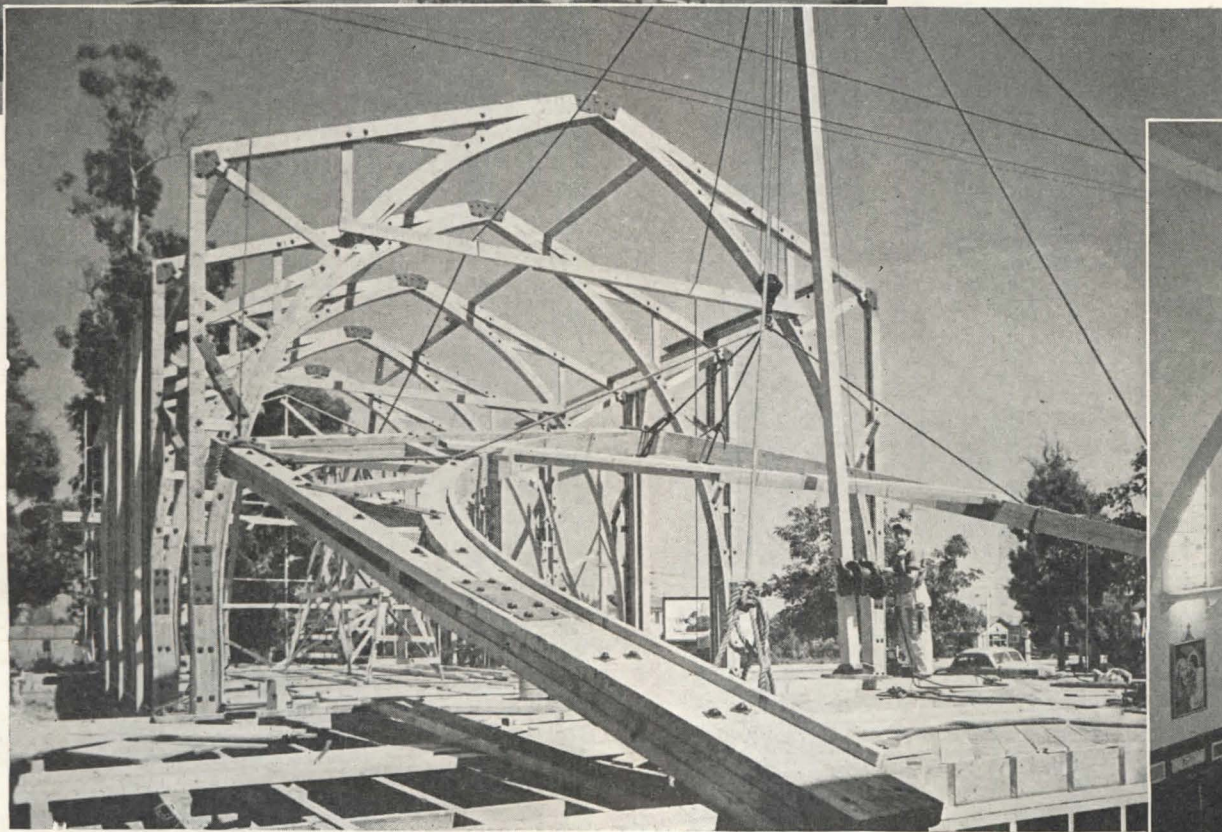
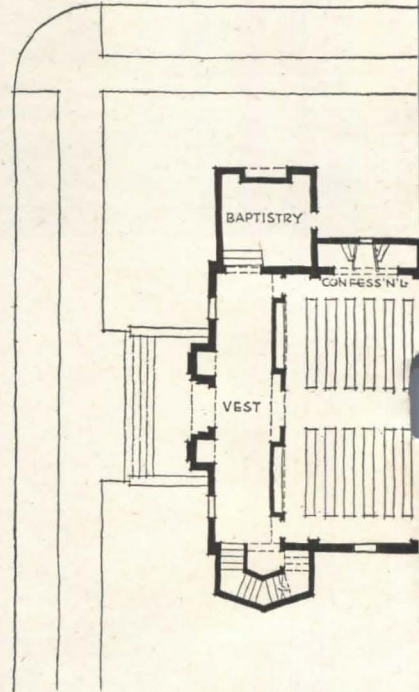
"This building was not built by general contract. On the first day after layouts were checked, the post-master, banker, merchant, etc., had excavation holes assigned. In the main this procedure was followed throughout the entire construction. Every Tuesday was donated. On other days an unskilled labor group was hired at a nominal fee.

"The entire project was 'poorboyed' to achieve the most building cubage for the least expenditure of dollars and cents. Structural steel from abandoned oil derricks nearby was cut into new uses. Sucker rods were used as reinforcing bars. Commercial projected sash was used throughout in lieu of more 'ecclesiastical' and expensive fenestration. The bare simplicity of the auditorium is the outgrowth of the meager budget and the unskilled labor available for construction.

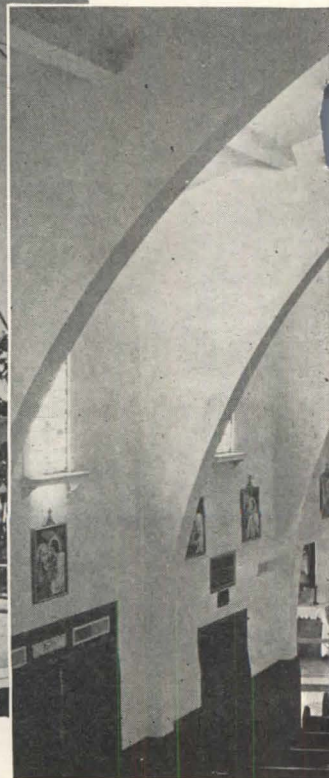
"At the present time the auditorium seating 400, with 150 additional in the balcony, and the south Sunday School wing have been erected at a total actual expenditure of approximately \$30,000. The east wing is scheduled to be built at a later date."



A plot of limited depth necessitated narrowing of side aisles in the plan for St. Anne's to assist in giving an appearance of greater length to the nave, dimensions of which are 60 ft. at the transept by 112 ft. 5 in. Floor has straight incline slope toward Sanctuary of 2 inches in 10 ft.

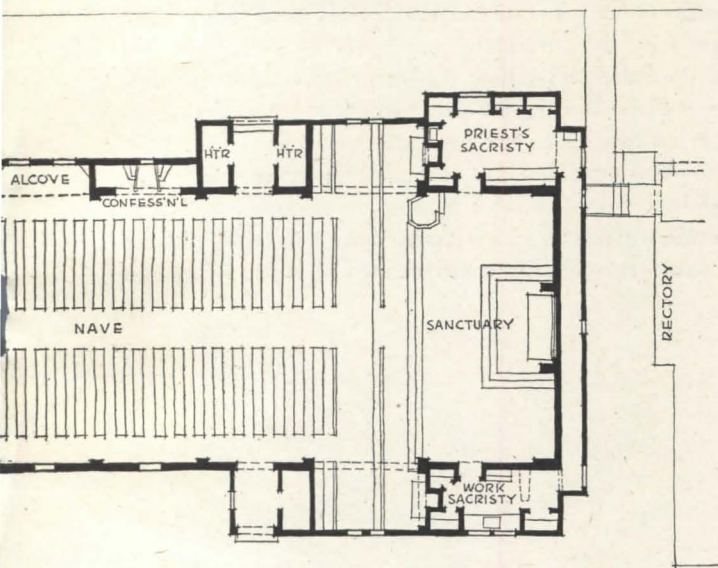


FLOYD RAY Photos



LAMINATED ARCHES FOR DIGNIFIED ECONOMY

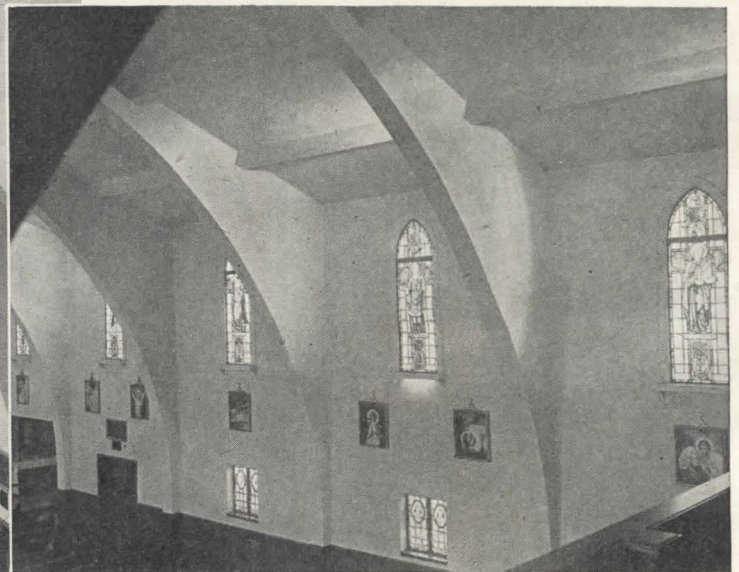
George J. Adams, Architect



PEACE, solace and a spirit of devotion" are objectives foremost in the mind of this architect when he sets himself to designing a church. In this case, for St. Anne's Parish (Catholic) in Santa Ana, Calif., it was necessary to try to attain them within strict budgetary limits.

Structural economy was achieved through the use of factory laminated arches, recommended by Paul C. Ruth (see page 106 of this study) as a means of cutting church building costs "without sacrifice in beauty or dignity." All members of the six three-hinge wooden arches were fabricated in the shop of Summerbell Roof Structures, Los Angeles, knocked down and delivered to the site, where each arch was assembled and erected as a complete unit. The lower truss chords are continuous glued members, using water-resistant casein glue according to standards of the Forest Products Laboratory.

In his treatment of the interior, the architect has allowed his structural principle to speak for itself, with the plastered-over trusses producing "repetitive forms usually associated with churches. The treatment of the nave was carried through to the back wall of the Sanctuary and over the choir loft above the vestibule, thus adding apparent length."



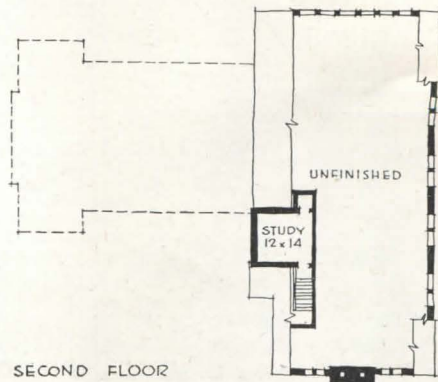
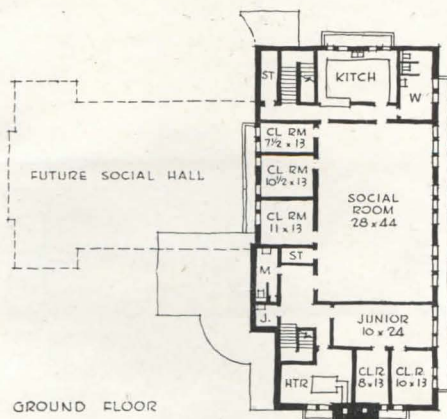
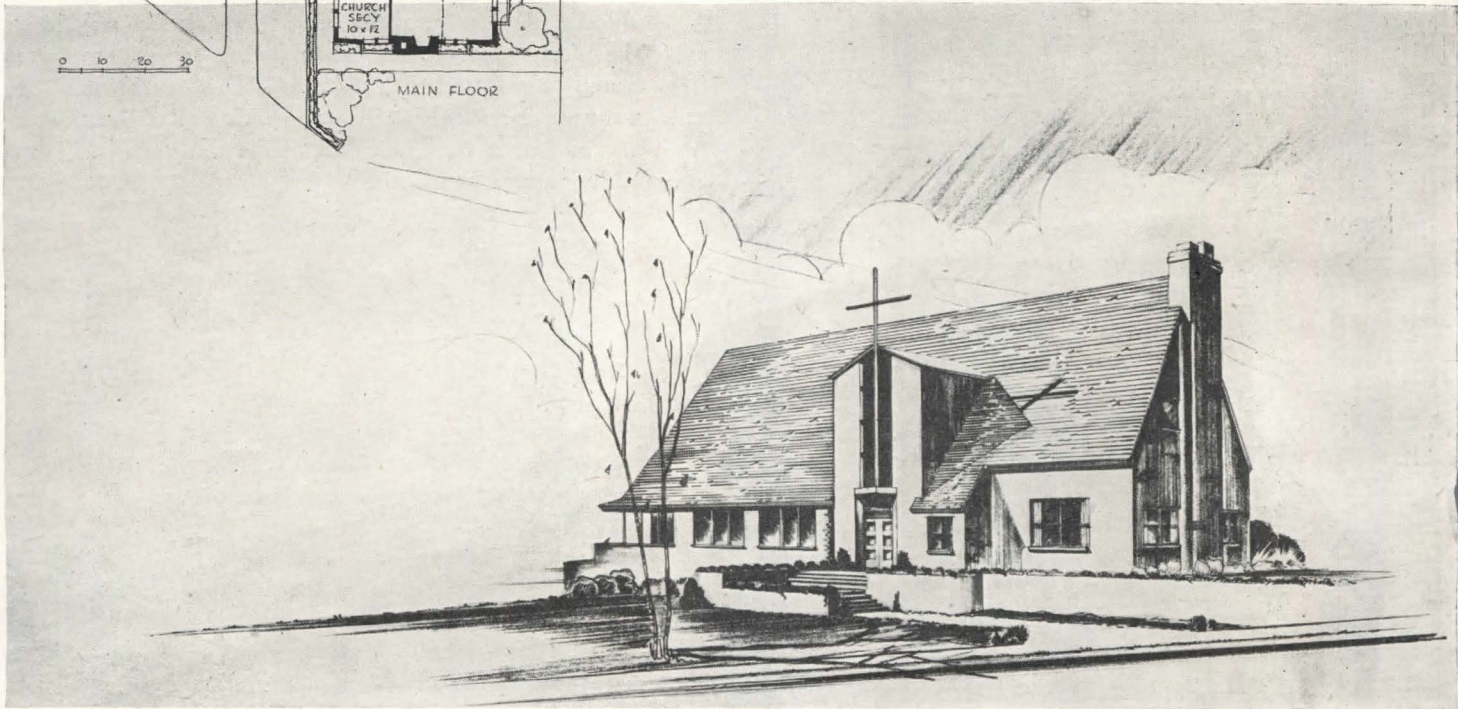
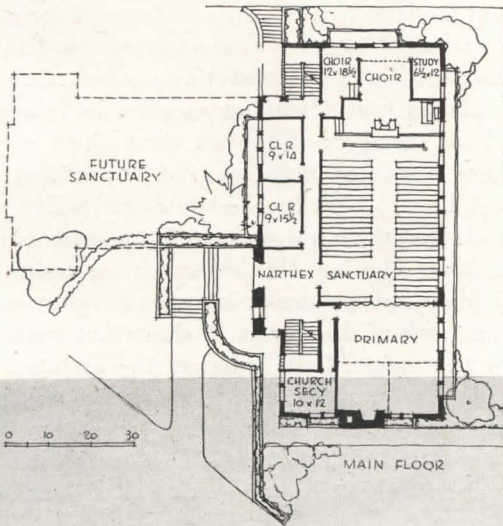
MILES BERNE Photos

PROGRESSIVE PLAN FOR UNITED BRETHREN

Naramore, Bain, Brady and Johanson

Architects

FOR "a gently rising triangular property bounded by three streets in a Seattle residential area," the architects have devised a plan to suit present conditions and parish means, with elastic capabilities toward future appropriations and brighter building prospects. The plans left and below show the first stage, eventually to be entirely an educational and "activities" wing, but temporarily to contain the Sanctuary as well. Plans on page opposite show how the future permanent Sanctuary will be developed and temporary worship space converted into class and recreational areas. (Note how future plans provide for extension of both Sanctuary and social hall to meet peak seating requirements.) Construction will be frame, with brick veneer outside; plaster and paint throughout interior; roof shingles of cedar.





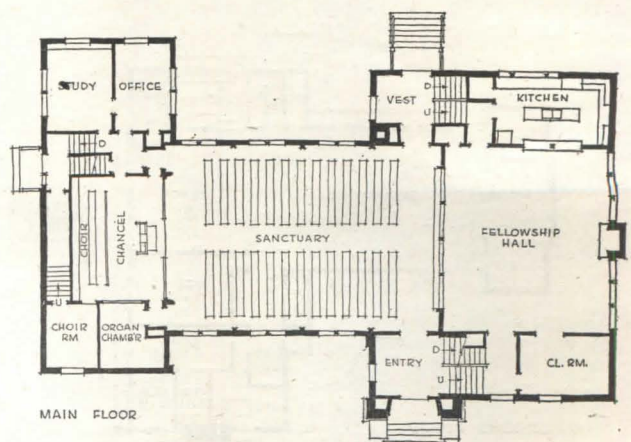
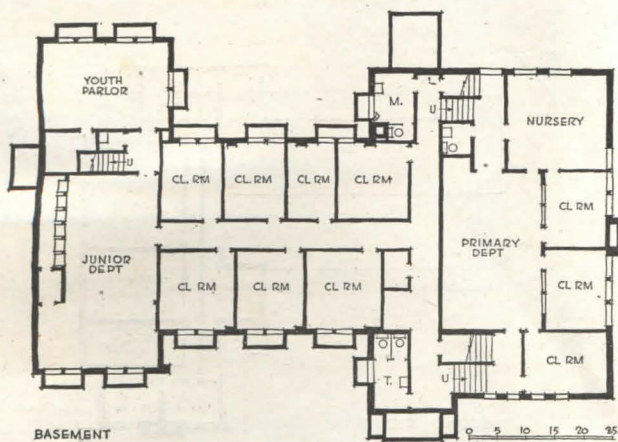
TWO OREGON DESIGNS

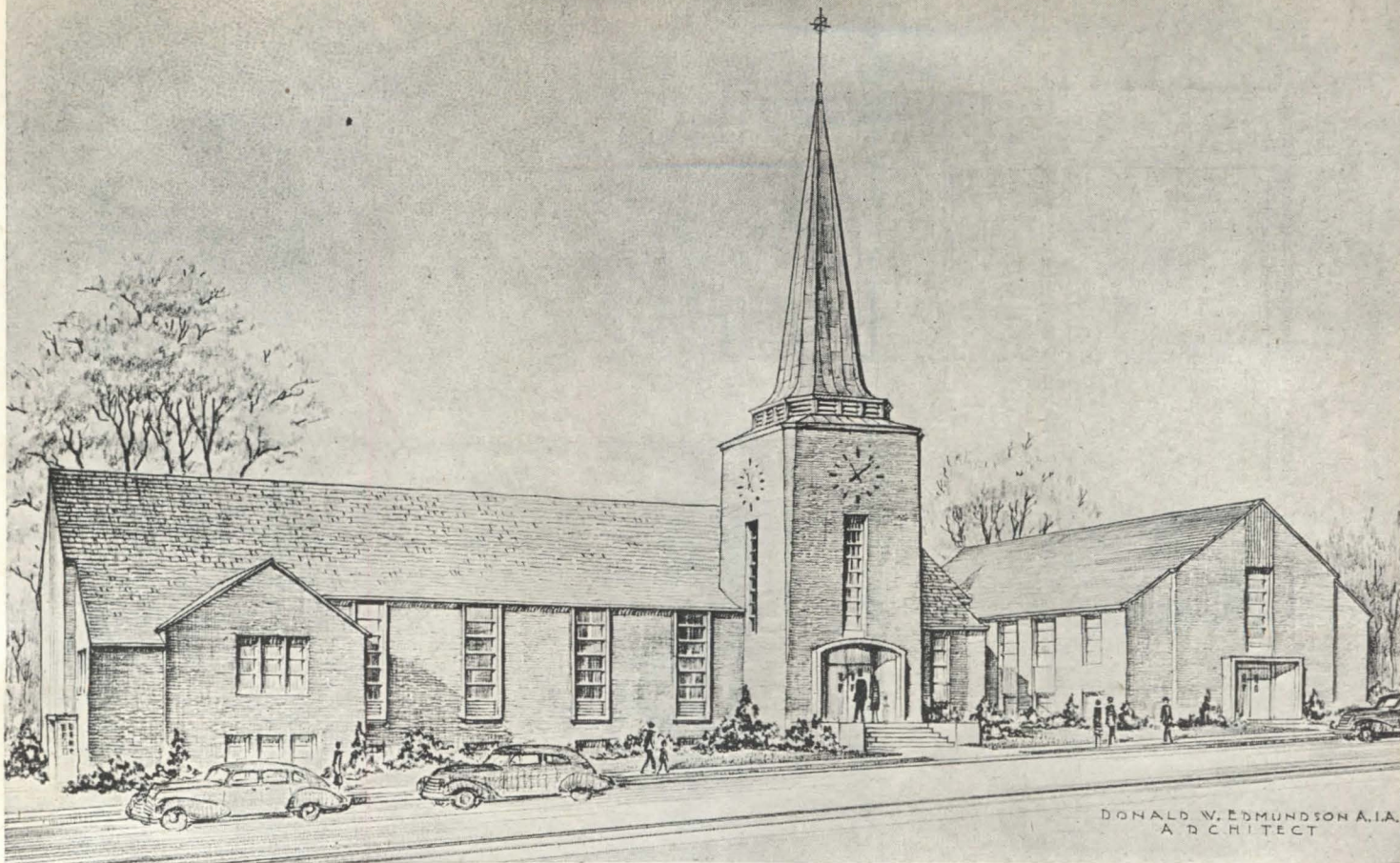
Donald W. Edmundson
Architect

IN THESE designs for suburban Portland, the architect continues to exercise a characteristic freshness of approach discernible in previously published work (see ARCHITECTURAL RECORD, September, 1945, p. 88).

The plan for Mock's Crest Evangelical Church (on

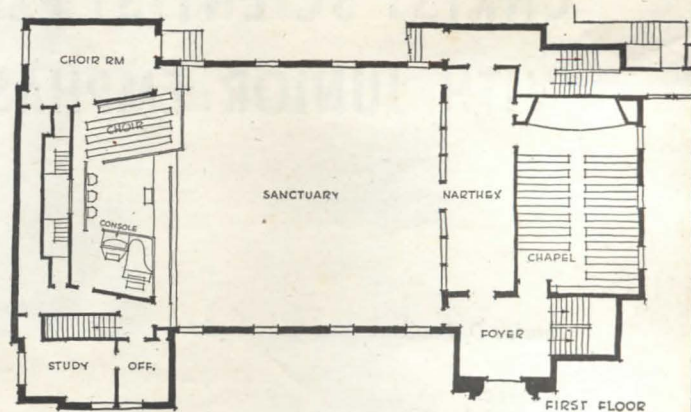
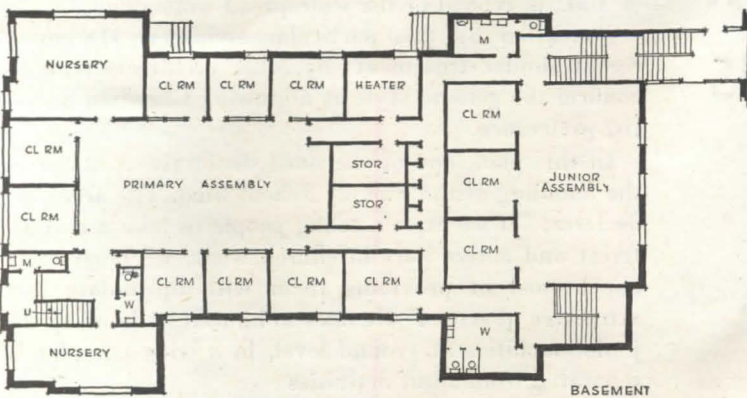
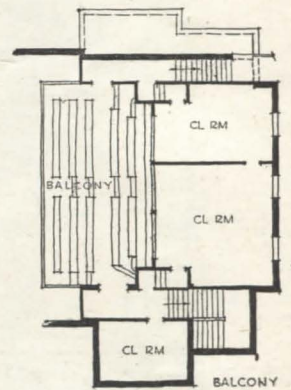
this page) provides seating in the sanctuary for 222. Floor of the adjoining fellowship hall is 4 ft. above that of the sanctuary, the two rooms being separated by double glassed openings normally to be curtained. Intentions are, at times of unusual attendance, to accommodate 50 to 60 additional persons, with good visibility of the chancel by opening the curtains and using microphones at the platform. When not required for overflow during services, the space will be used as a mothers' room. Elevation of the fellowship hall also permits floors of primary department and nursery below to be within 30 in. of the finished grade. Construction will be frame with veneer of split Roman brick, laid with ran-

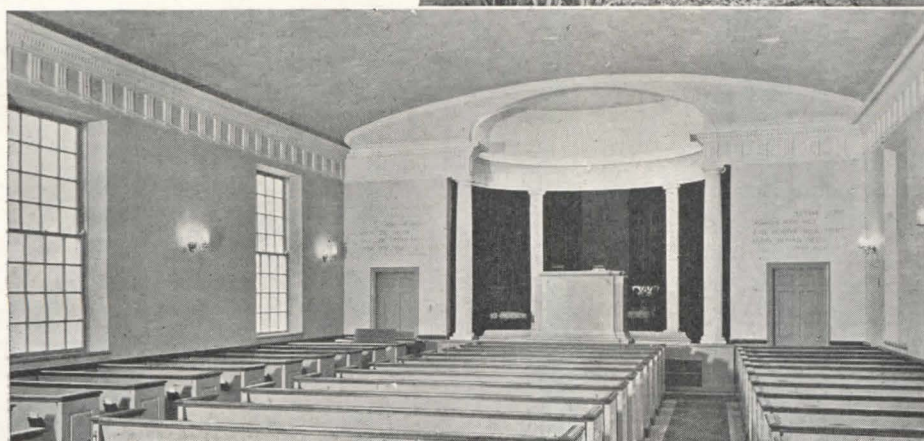
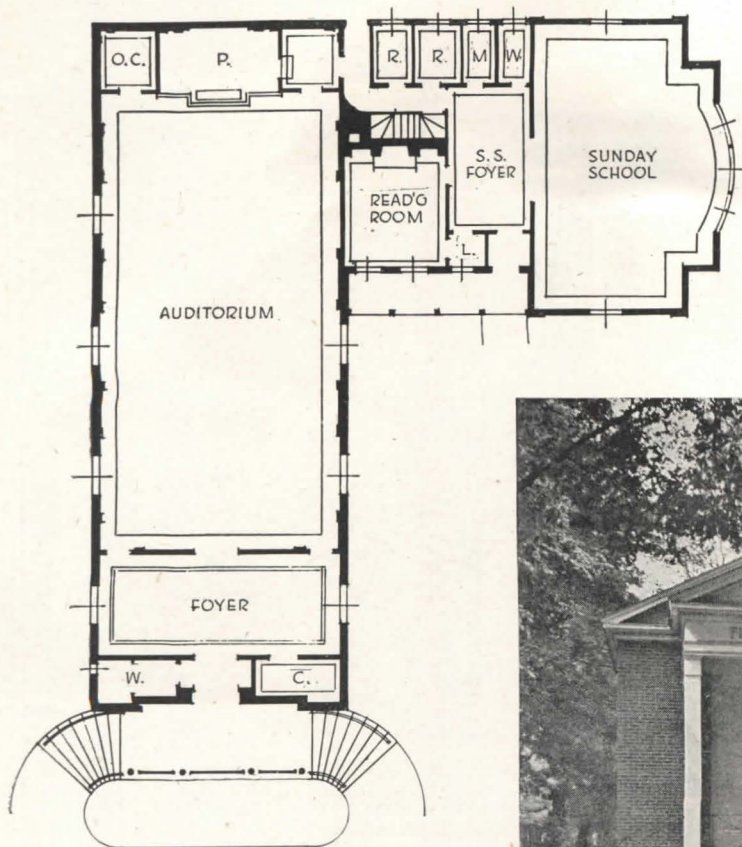




dom vertical joints. Cross motif in gables is accomplished by recessed slots.

Sellwood Church of the Nazarene, shown on this page, is still in the process of preliminary development. The fellowship hall and related facilities (not shown in plans) will be in a separate wing to be connected by covered passageway with the main building. Space between will be landscaped as a sunken garden and used for outdoor meetings and social gatherings. Sanctuary will seat a total of 517; 374 on the main floor, 40 in the choir, 103 in the balcony. Small chapel at the rear of the building will seat 105. Floors of facilities in the basement are to be only slightly below the level of finished grades.





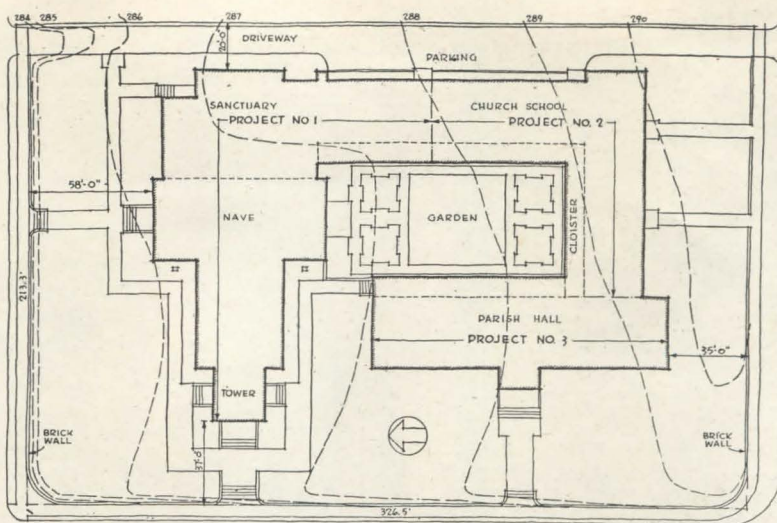
CHRIST SCIENTIST PLAN WITH JUNIOR EMPHASIS

Charles D. Faulkner

Architect

THIS First Church of Christ Scientist, at Valparaiso, Ind., is typical of the widespread work done for the organization by this particular architect. Moreover, recent similar treatments by other architects tend to confirm the general style as a growing Christian Scientist preference.

In this plan, one of the most distinctive features is the handling of the Sunday School wing. The architect declares: "If we expect young people to take a real interest and active part in church work, we must exert our utmost in providing them with up-to-date and attractive quarters." He does so himself by housing the junior facilities at ground level, in a wing completely separated from adult activities



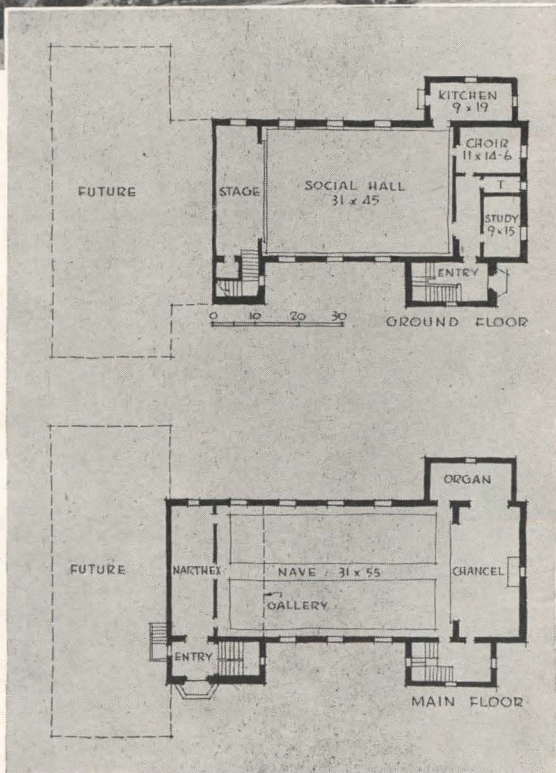
BY DEMAND of the parish," the architects write, the exterior of St. John's Episcopal Church, to be built in Memphis, "is similar to that of Bruton Parish Church at Williamsburg, Virginia. St. John's, however, will be much larger, with a seating capacity of 500. Also, the interior is more elaborate, in keeping with Episcopalian ritual, requiring an amount of symbolism which we have incorporated in wood carving on the chancel screen, pulpit, lectern, and reredos."

The total project will be built at a cost of \$500,000, in three stages as shown in the plot plan. Exterior walls will be brick bearing; roof rafters and trusses, steel; asbestos roof shingles. Interior walls will be plastered and painted, with frescoes in Baptistry and Chapel.

WILLIAMSBURG STYLE IN THE DEEP SOUTH

Dent & Ayedelott

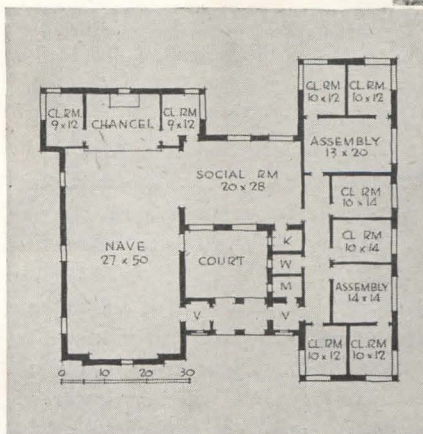
Architects



THREE SOUTHERN CHURCHES

Barber & McMurry, Architects

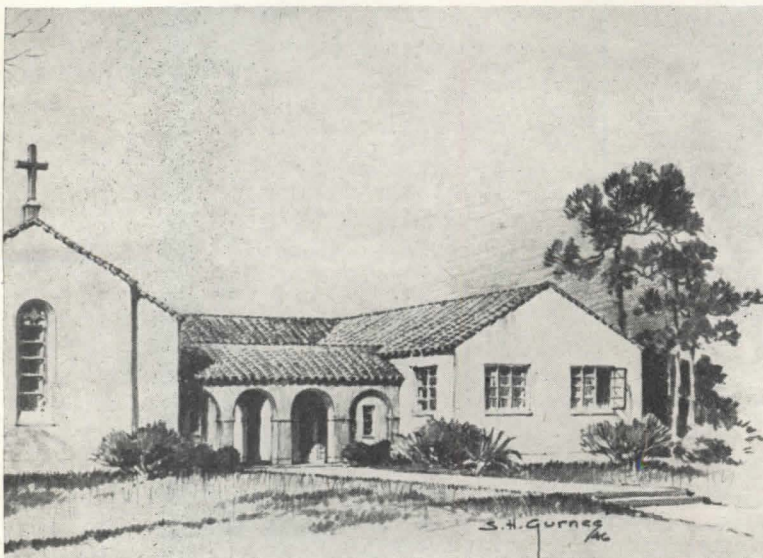
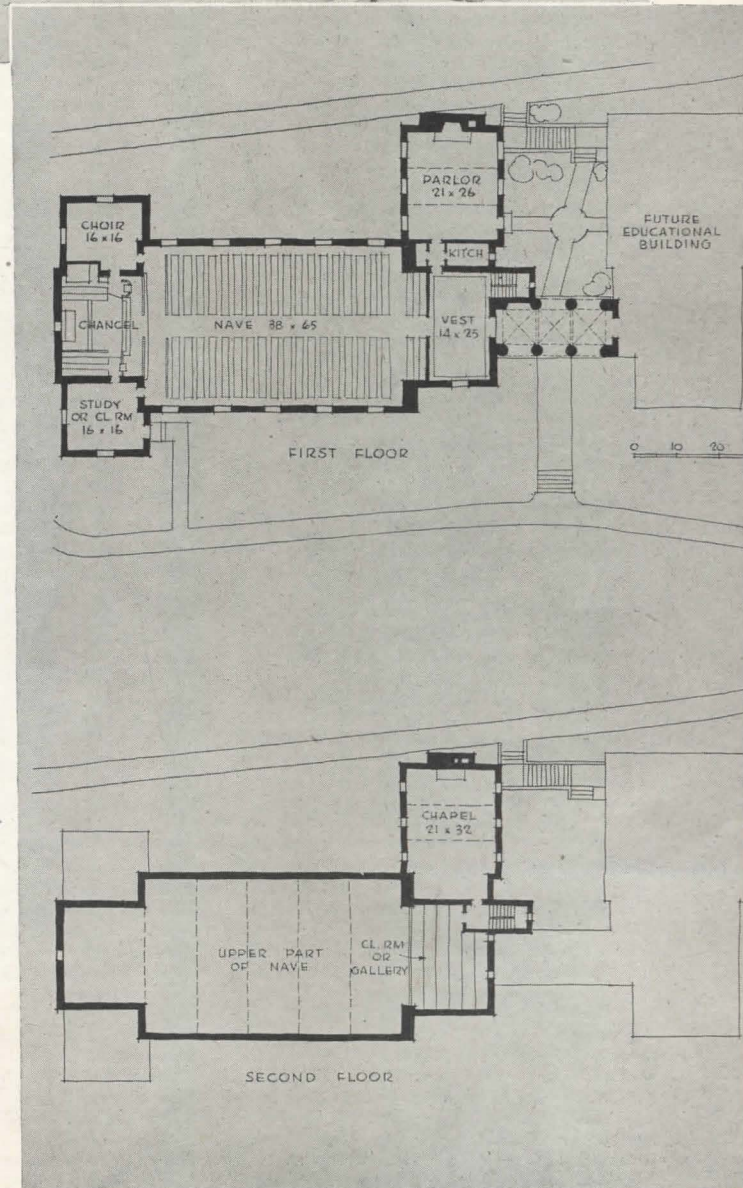
THESE three latest examples from an architectural firm, famously active and successful in adapting the form of the church to the solid conservatism of small southern communities, tend to imply a formula pro-



Plan for First Methodist Church at Clewiston, Fla. (right), shows solution of the peak attendance problem — a social hall that may be utilized for supplementary congregational seating at Christmas time and Easter



cessively discernible in previous RECORD church studies (see work of Barber & McMurry in issues of September '44 and '45). In the Methodist churches for Bristol, Tenn. (across page) and Canton, N. C. (above), the architects' usually direct approach to interior function, and their respect for client preferences regarding the exterior, have resulted in designs that are unmistakably characteristic. In each case the treatment of the tower amounts practically to a signature. In the small church for Clewiston, Fla., below, they show themselves equally at home in expressing the influences of mission tradition.



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ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

THE BETTER WALL IS COMING

By Robert L. Davison*

THE PROBLEM: *It is now financially impossible for the average man to buy, build, or rent a new four-room apartment or home.*

THE SOLUTION: *"The real solution probably lies in some radical departure in house construction and economics, as it does not appear to us that we are likely to have such relative readjustments as will correct this situation."*

SOUNDS like 1946. But this was the introduction to an article I wrote for ARCHITECTURAL RECORD in October, 1929. The quotation is a statement by Herbert Hoover, when he was Secretary of Commerce.

It is surprising how little technical progress has been made in the intervening years. The evolutionary advance has been slow. Right now there is considerable promise that technical practice and manufacturing enterprise may catch up with the ideas and principles that were already evident in 1929. Again there is a strong urge in the economic situation in housing; there is a shortage of normal building materials, as well as of houses and apartments. And there is the wartime technology, which has given us not only a galaxy of new materials and techniques to adapt to building, but also a more favorable attitude toward scientific potentials.

The 1929 article had much to say about the possibility of a new wall material, something lighter, better insulated, less bulky than the conventional masonry wall. It outlined a concept of scientific research in materials and techniques which would visualize an ideal and work toward it, rather than the more conventional approach of starting with available materials and trying to develop them. Through all the years the latter has continued to be the typical approach, but the building industry now has so many new materials arrayed before it that it should not prove difficult to get pretty close to the ideal thing. Currently there are many attempts to be revolutionary instead of evolutionary

about the whole technology of housing, and they may or may not succeed. But certainly it should be possible to go at least as far as a better wall.

And how badly we need it right now! The veterans' housing program has bogged down; it begins to look like years rather than months before even the emergency part of the housing shortage will be overcome. There are simply not enough conventional materials and equipment being produced. Costs are high. There is need for every new material and money-saving method that technical ingenuity can concoct. If a new wall system would help in rental housing, the veterans would be especially thankful.

NEW MATERIALS AND RENTAL HOUSING

The multi-family rental housing field is the logical place to introduce a radically new wall material. Assume that a wall composed of insulating material, covered with copper, stainless steel or aluminum, "papreg" or "compreg," were developed at a prewar cost of 75 cents per sq. ft., finished. It would cost 25 per cent more than the standard frame construction of single-family houses, but approximately 50 per cent less than the conventional apartment house wall. Therefore, there is no direct price incentive to use the new type wall in single-family housing, but a great price incentive in multi-family dwellings, not only because of its lower initial cost, as compared to a traditional wall, but due also to its being only 2 to 3 in. thick instead of 10 to 12 in. thick. This provides an

additional rentable floor area which will give a net profit of \$1.00 or \$1.50 per lineal foot of wall per floor per year.

And in apartment construction economics tend to lift the clay feet of traditionalism. The builder is interested in financial return, not in a cozy retreat from the machine age. To many home owners a metal-clad wall would be acceptable only if made to resemble clapboards. The apartment dweller would be less concerned with conservatism. The builder could accept the money- and space-saving advantages without worrying much about tradition.

This of course does not mean that the new materials will never be used widely in single-family houses. With their perfection and quantity in apartment use, their cost will be reduced. And in time the simplicity, ready availability and other advantages of these newer construction materials will lead to their forthright acceptance in single houses.

The drawings on p. 121, which were taken from the 1929 article, illustrate the lighter wall problem possibilities of the apartment house perfectly well for today. The weight comparisons shown can be improved upon today, for the newer insulating materials are surprisingly light. Now, how far have we progressed toward realizing this goal?

DEVELOPMENT OF NEW MATERIALS

Right now the building field is witnessing a hectic scramble to improve existing materials and methods, and to develop or adapt newer ones to building uses. It is a competitive scramble, and a de-

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tached scientist might be pardoned for complaining that today's research might be more scientific—scientific in the sense of being free to discard all competitive considerations and go searching for the technical ideal.

A factor in the immediate present is that all established companies can sell everything they can possibly make. And they do not have materials for something new and better, even if the true scientific research had been done and the ideal combination arrived at. Meanwhile the rush is on for new building; architects and builders cannot wait for development, tests and trials. Nevertheless, study is going forward, and in the light of present conditions it is not surprising if it all does not hatch immediately.

Meanwhile, however, there are new materials and new manufacturers coming into the field of building, in a process of reconversion of wartime developments. Two or three years ago we heard the definition of postwar planning as "figuring how we can get into the other fellow's business." If this type of planning has not been found too easy, at least there is plenty of it being attempted, and many of the new materials will enter building via this route.

For instance, there are the developers of lightweight materials which might now be used as the insulating core of structural laminates, which are suitable for all types of enclosure purposes, such as exterior walls, floors, roofs, and partitions. There are the metal manufacturers or fabricators, whose products could be used as the denser skin of the core material, such as non-ferrous metal, stainless steel, or plastic-coated ferrous material; or the plastics manufacturers who can provide a plastic impregnated fiber for

surfaces. In the field of equipment it is possible that financial interests back of some of the war aviation industries may develop radically new assemblies for the mechanical needs of the house.

Prefabrication has been a confusing element. When anyone speaks of the house of the future, many people think of the "prefabricated house." They have heard of such houses being produced on the assembly line at a prodigious rate for war use and may have read of the erection team which, in a race, had its house up, the water turned on, and a publicity girl in the tub, all in less than an hour.

Current prefabrication is, generally speaking, an attempt to do the old job better, not to do a new job. The houses are fabricated faster and in larger quantity with some improvements, but they are essentially the old house. A better term for these houses would be "partially pre-assembled." Most of the redesigning that has been done has been in the interest of fitting the house for a changeover from handicraft assembly to quantity production assembly. It is evolutionary and it is progress, but is not necessarily scientific progress. By evolutionary methods one could keep on breeding horses until kingdom-come; one might get slightly faster transportation by horse and buggy, but one would never get an automobile.

The energetic study of prefabrication that has become so widespread is not to be disdained. But it is not truly scientific in the sense mentioned before, and it has too many problems in too many directions to help very far in the search for the best materials.

What we need is a processed wall, rather than merely a prefabricated one. A plate glass store front is an example of

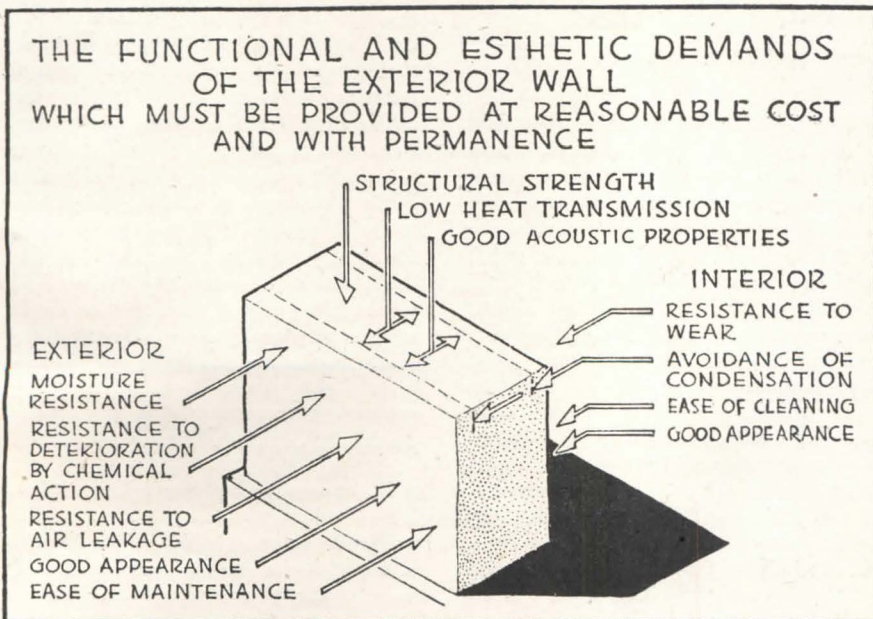
a processed wall material which is not merely an imitation of masonry or frame construction but by itself is the wall. One can visualize the development of a material which might perform the functions of a nontransparent wall as well as glass performs the functions of a transparent wall, and might be as universally used.

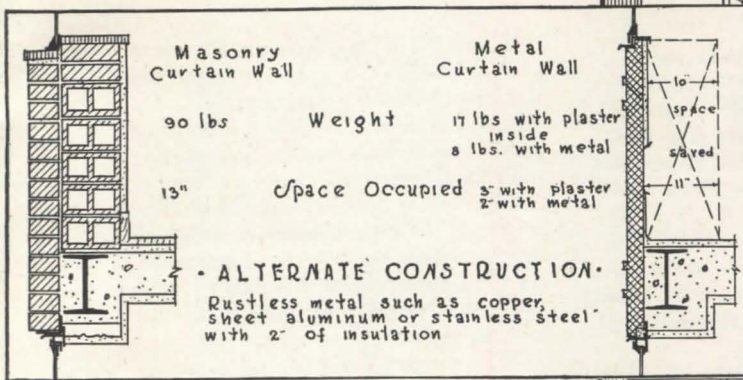
An interesting though largely hypothetical advance toward the discovery of such a material was the scientific investigation of Professor J. D. Bernal, head of housing research for the British Government. Professor Bernal decided to discard present ideas of materials entirely and start with a new approach: the formulation of a theoretically ideal wall material. He asked himself: "What molecular structure would make the ideal exterior wall?" and decided upon a crystalline structure that would have no cleavage planes between groups of atoms (leading to fracture), and that would be "transparent" to high-temperature radiation from the sun (letting its warmth through) and "opaque" to heat from comparatively low temperature sources (holding in the heat generated inside the building). Further qualities considered desirable were light weight, high tensile strength, and elasticity. He discovered a crystalline form, closely approximating this ideal substance, in the joint of bamboo, concerning which he remarked:

"The aerogels which are found in certain plant products, notably the pith of bamboo, can now be made in the laboratory as hard solids several times lighter than cork and practically perfect insulators against heat. They also have the incidental advantage of being completely fireproof. If such material could be produced on a large scale, then walls and partitions could be made from slabs weighing about one pound per square foot." Present walls weigh about 10 pounds per sq. ft. for wood-frame; up to 150 lb. or more for masonry.

A substance that is relatively near to Bernal's ideal in some characteristics is Santocel, a material that was developed by Monsanto Chemical Company. This is a silica aerogel, described by the manufacturer as "a very light porous form of silica, having an apparent density of 8.0 to 8.5 lb. per cu. ft."

It also is said to be one of the best heat insulators known. "Resistance to the flow of heat through its mass is the most startling of the novel characteristics of Santocel, since its resistance is greater than was believed theoretically possible. Prior to the discovery of Santocel, the best heat insulator [aside from a vacuum] was a space containing 'still air.' This was theoretical and could be arrived at only by calculation, since heretofore it has been impossible to prevent air within a space from moving either in a mass (convection currents) or molecularly and this movement destroys [reduces] insulating value of air space.



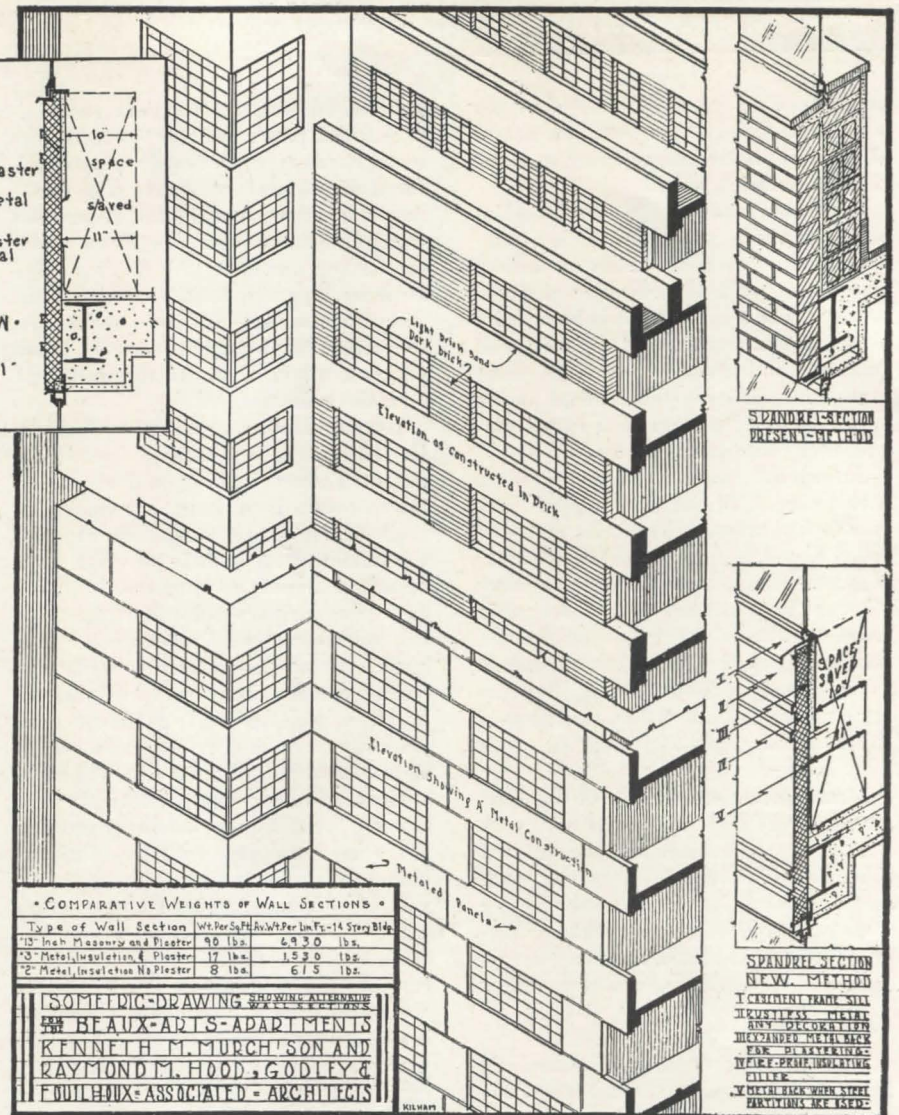


Interest in exterior wall sections, now receiving impetus from current lag in production of conventional materials, is not entirely new, as evidenced by these sketches (reprinted from October, 1929 RECORD) calling attention to advantages of metal-faced panels with insulating core. Idea was to show how their use might have reduced wall cross-section and increased living space in a building such as the Beaux Arts Apartments in New York

"All previously known insulating materials [except those combatting radiant heat] make use of the fact that quiet air is a good insulator, the insulating masses entrapping air in a multitude of small spaces where convection currents are kept at a minimum. These air spaces while small enough to prevent the mass movement of air in convection currents are very large as compared to the path taken by air molecules in their constant vibration. As long as air molecules can move freely they will conduct heat effectively."

At present, this material is too expensive to use as a curtain wall for enclosing dwelling space. Its commercial use will probably, for the first few years, be confined to insulating refrigerators. If it ever becomes available for housing, it should be possible to have a 1-in. thick wall which would have an insulating effect more than twice that of a 12-in masonry wall. While this decrease in heat loss from the wall of a building would amount only to 2 to 3 cents per sq. ft. of wall per year, the increase in comfort and the rapidity with which buildings could be heated in the morning would have considerable advantage.

Celotex Corporation is reportedly improving its Cemesto board, which has been used extensively in war housing for both single-family houses and dormitories. All necessary components — exterior weather surface, insulation, and interior finished wall surface are integrated into a single structural board, which is made up of an insulation board core veneered in manufacture with a



1/8-in. sheet of asbestos-cement on both faces. For exterior walls, a board with a 1 1/2-in. insulation core is used; for inner partitions, the insulation core is 1/2 in.

Honeycomb laminated panels have been developed by United States Plywood Corporation and the Glenn L. Martin Company, in which a lightweight core material, resembling a honeycomb in appearance, is sandwiched between and firmly bonded to two facing materials or "skins." The core or "honeycomb" may be made of paper, paper cloth, fiberglass, or fabric, impregnated before the core is formed with a phenolic resin. The weight of this core may be as little as 4 lb. per cu. ft., depending upon the material used. The surface material or "skin" may be wood veneer, plywood, aluminum alloys, stainless steel, or plastic sheets of any thickness, and firmly bonded to the thin edges of the honeycomb core by a plastic thermosetting adhesive.

These honeycomb laminated panels were originally developed for plane floors and bulkheads during the war, but the manufacturers expect that it will soon be

available for use as wall panels in building construction. At present they are available in flat sheets only, custom-built to specification, but manufacturing techniques are now being studied for making possible the fabrication of curved surfaces.

There are various foam plastics which excite interest and may be used extensively some day as core material for metal wall units. Their advantage lies in their high insulating value, elasticity, and light weight, which provides ease in transporting and installing, but many possess a disadvantage in lack of fire-resistance, which could be provided to a degree by metal surfaces. Price per pound is still high, but is expected to decrease. When their light weight is taken into consideration (3 to 6 lb. per cu. ft.), and also the fact that less than 1/4 cu. ft. is needed for a square foot of wall, a cost of 20 to 30 cents per pound is not prohibitive. A price of 10 cents per pound might permit use of these panels in single-family houses.

At this time we have not discovered any insulating core material and surface

material which meet all requirements for a wall material 100 per cent, but nearly all combinations are superior in some respects to brick walls.

Foamglas, composed of countless glass cells containing sealed-in air, is a non-combustible material offering insulation, water-stop, and vapor-seal in a single product. For this reason it is being used as an insulating material for core wall construction in masonry. It might prove a good insulating core for metal panels or wallboard if the problem of its non-resilience could be overcome.

Several other core materials are worth considering. Calcium hydrosilicate, previously known as Microporite and now called Kaylo, is more rugged than Foamglas, but not vaporproof. For this reason, it would be necessary to seal the panel hermetically on the inside or provide ventilation of the exterior wall surface to remove any moisture that might penetrate the insulation. A 3-in. thickness of this material would withstand at least a 2-hr. fire test.

Most synthetic materials of this kind are relatively high priced and have only a limited availability at the present time. For this reason, the early types of metal-encased insulating material for walls may well have cores made of Vermiculite in board form, lightweight gypsum, or lightweight foam-fiber concrete.

METAL PANELS

Considerable experimentation has been made on metal wall sections, particularly in the small-house field. Lincoln Houses Corporation has developed a house with

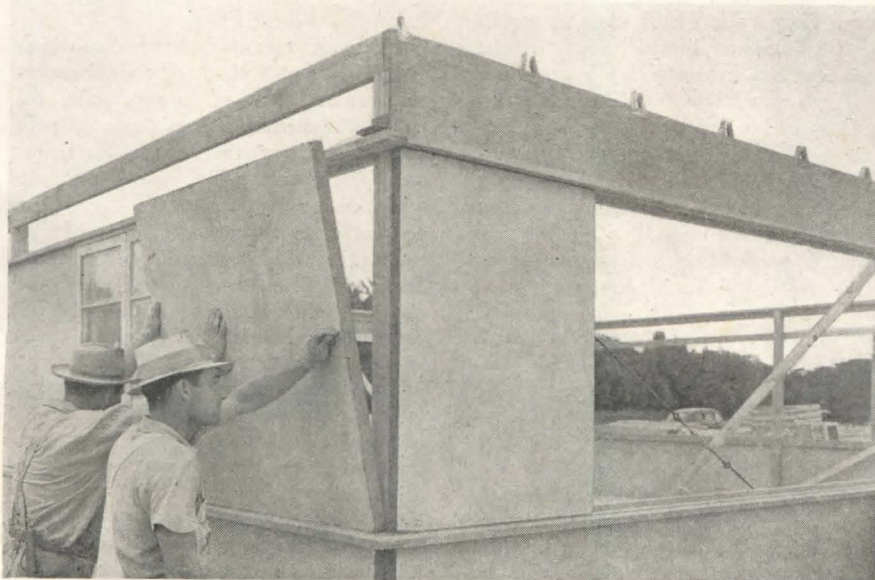
lightweight walls of Bakelite resin-impregnated paper cellular core, of the honeycomb type previously mentioned, faced with aluminum sheets. The house has a concrete block foundation; and concrete poured over a grill of metal reinforcing serves as the flooring. The structural panels, 8 ft. long and 4 ft. wide, then are set into place and joined to each other by metal screws. These panels are 2 in. thick for the walls and 3 in. thick for the roof.

Harman Homes, produced by William H. Harman Corporation, features a patented steel framing and sheathing interconnected to form a monocoque shell for the entire house. Insulation of the outside steel walls is provided by a non-rigid blanket type material applied to furring strips which are attached to the steel structure between inner and outer wall sections. Interior walls and ceiling consist of 3/8-in. thick plasterboard for walls, ceilings, partitions, and closets, except in the bathroom, which is of waterproof asbestos cement board.

Harman's houses may well be the first housing development to be granted a guaranteed market by the National Housing Administration, following analysis of its materials and construction method by the NHA Technical Branch.

Then there is the Higgins house which employs wall sections made with enameled steel panels. These are sheets of low-carbon steel of various sizes upon which is baked a porcelain enamel facing. Inner and outer panels are securely fastened together 2 1/2 in. apart, and an aerated concrete poured between them.

In low-cost wartime housing, Cemesto board was used as a lightweight-panel wall section. Manufactured as a single structural board, it combines a 1 1/2-in. core of insulating material with a weather face and interior wall surface of asbestos cement, 1/8 in. thick



OFFICIAL INTEREST IN NEW MATERIALS

Wilson W. Wyatt, Housing Expediter and Administrator of the Veterans Emergency Housing Program, has stated that, "Just as we are doing everything possible to increase the supply of existing traditional materials, such as lumber and bricks, for the conventional builder, we are at the same time going to do all we can to enable developers of new materials and construction methods to make their maximum contribution to the housing program.

"The country's housing needs are so great that all the houses that all the conventional builders can erect won't be enough. We believe that the quickest and cheapest way of supplying additional housing capacity is through industrially-made homes. We want the present prefabricating plants to build all the veterans houses they can, consistent with our low-cost program. But since most of them use lumber and plywood, their output will be restricted to the amount of both they can get. For the additional production needed, and especially to achieve low-cost housing, we are encouraging the mass production of factory-built houses to be made largely out of aluminum, steel, plastics, and concrete.

"Metal houses are very promising from several angles. They lend themselves to assembly-line production, the same as automobiles and airplanes. Mass production makes for low cost, an equally important factor in our veterans housing program.

"Concrete houses are also encouraging. Materials are in ample supply and relatively low in cost. Data on hand indicates good possibilities for low-cost homes."

Both groups, Mr. Wyatt points out, are experimenting with a number of new materials. In the metal group, for example, thin metal sheets are bonded to a core made of a variety of materials, such as plastic-impregnated paper, balsa wood, and plywood which have both insulating and structural value. In the case of one product, foamed concrete is poured between metal sheets. In the concrete group, the producers are finding ways to reduce the weight of their product. In some cases, lightweight aggregates, like wood fibers, slag, and volcanic rock are being used. [In some instances clay pellets and certain types of rock are subjected to heat, which causes contained water to be converted to steam, exploding the clay or rock and giving them a "popcorn" effect.] When used with cement, this type of aggregate gives improved insulation and reduces the weight per cu. ft. to 1/3 to 1/4 the weight of ordinary concrete.

A similar note is sounded by John R. Steelman, new Reconversion Director, demonstrating the current strong trend

toward new materials. In his report, Mr. Steelman cited materials which "have been found useful — though on a small scale, since they cannot get into high volume production for some time."

These materials include:

"Precast concrete panels, which will make it possible to build concrete houses without scarce equipment; new aggregates for use in concrete mixing, such as slag, wood chips, waste paper, and agricultural waste; pre-stressed floors and floor panels; wallboards made of plastics and chemically-treated fibrous waste; wallboards which are fireproof and have high insulating properties; wallboards reinforced with noncritical metal sheeting, and wall panels consisting of two outside 'skins' separated by a structural frame of lumber or metal or held together by an insulating core . . . to save the lumber required for inside framing."

BUILDING CODES

In order to utilize fully the advantages of these new materials and construction methods, improvements in our building codes are needed. In recent years a great deal has been written and said concerning the substitution of performance requirements for detailed specifications as used in most building codes. While this is a desirable step, there is danger in setting up performance requirements unless they are realistically related to actual functional needs. I should like to differentiate between performance requirements and functional performance requirements by giving an example. In

Report B MS-88, "Recommended Building Code Requirements for New Dwelling Construction," of the National Bureau of Standards, the following definition is given (*italics are mine*):

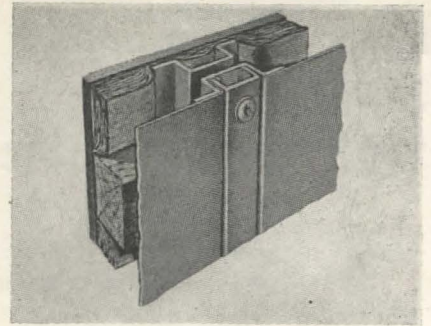
"(a) Type I. Fireproof Construction. That type of construction in which the structural elements are of incombustible materials with fire-resistance ratings sufficient to withstand the fire severity resulting from complete combustion of the contents and finish involved in the intended occupancy.

"But not less than the rating specified in Table 1."

The first part of this definition is a functional performance requirement and in my opinion is the type of functional performance requirement that should, in principle, be applied to all types of housing regulation. This first half of the definition was put in at the insistence of the most progressive members of the committee drafting this report; the latter part of the definition may set minimal test conditions which are much more severe than those in the first half.

APPEARANCE

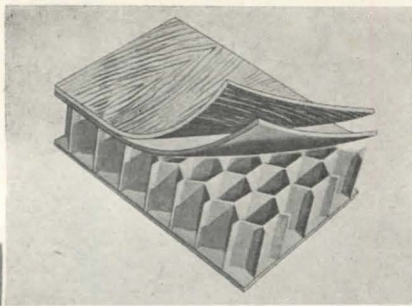
The question is often raised as to whether or not people will accept radically new materials and construction materials. They will if the materials and methods are a real advance from the standpoint of quality and economy. There is an interesting commentary on the acceptability of new materials in the case of office furniture. Originally filing cabinets were of wood in which the nat-



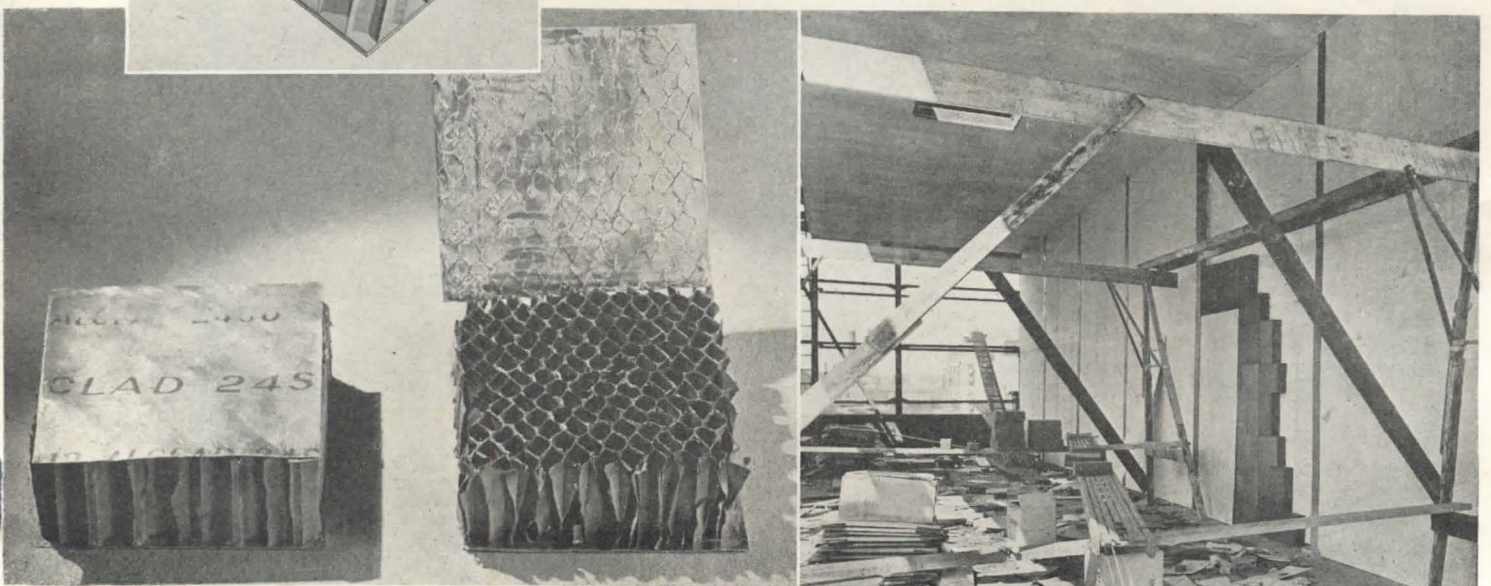
Steel framing and sheathing interconnect to form the shell of the Harman house

ural grain showed through the coat of varnish. The first metal cabinets were made to resemble wood by giving the metal surface an imitation grain finish. Later on, the public accepted the idea of finishing the metal a solid color such as dark green, which in no way imitated wood. Finally, due to the metal shortage during the war it became necessary to manufacture filing cabinets again from wood, but these were made to resemble metal in design and color. Similarly, I believe that new materials will someday come to be accepted frankly for themselves, rather than forced to imitate the older materials, as is often the case today. And their acceptance may someday be so complete, that the older materials might well be forced to imitate the new, should the occasion arise.

Photos courtesy of Pittsburgh Corning Corp., Celotex Corp., Bakelite Corp., William H. Harman Corp., Lincoln Houses Corp.



Left: Honeycomb-plywood laminate, first used for bulkheads in aircraft, is now being studied as material for wall sections. Below, left: Sample of Bakelite resin-impregnated paper cellular core faced with aluminum sheet metal used for walls in Lincoln house. Aluminum sheet has been sheared away from tenacious bond to show honeycomb. Below, right: Foamlas, here being used in separate block form as insulation between asbestos-cement boards, offers interesting possibilities as core in integrated wall sections



LIGHTWEIGHT FIRE-PROTECTION FOR STEEL

Fireproofing tests indicate that vermiculite-gypsum plaster may offer a lightweight and space-saving means of protecting structural steel surfaces.

THE vermiculite and gypsum industries are now offering vermiculite-gypsum plaster, already known for its sound-deadening and insulating qualities, as a space-saving and weight-saving means of fireproofing structural steel members. It should prove particularly effective for protecting steel joist floors, where 1 in. of vermiculite on metal lath will provide 4 hr. of fire-resistance, perhaps meaning the difference between a Class II and Class I building, with reduced weight, increased space, and reduction in insurance rates.

In order to demonstrate this usefulness of vermiculite-gypsum plaster on metal lath as a fire-retardant for structural steel not otherwise fireproofed, a series of fire, hose stream, and deflection tests were recently conducted by Munn and Steele, Inc., with the cooperation of the Pittsburgh Steel Company, Steel-Joist Institute, Newark Plaster Company, and the Gypsum Association. Test engineers were provided by Protexol Laboratories, Inc.

Vermiculite is made of inorganic min-

erals that are hydrous silicates derived generally from alteration of some kinds of mica. The specific purpose of the tests was to determine its value in plaster form to protect structural members in Class A construction, which requires that the protected steel temperatures shall not exceed 925° F. in 4 hr. with the furnace attaining a temperature of 2000° F. under the conventional time-temperature curve. Members tested included floor, girder, and column assemblies, and 1 in. of vermiculite plaster on wire lath was found to give the required protection in every case except that of columns, where the limit was reached at the end of 3 hr. and 35 min. A column which received the additional protection of a fill of loose vermiculite successfully passed the 4-hr. test.

TEST STRUCTURE

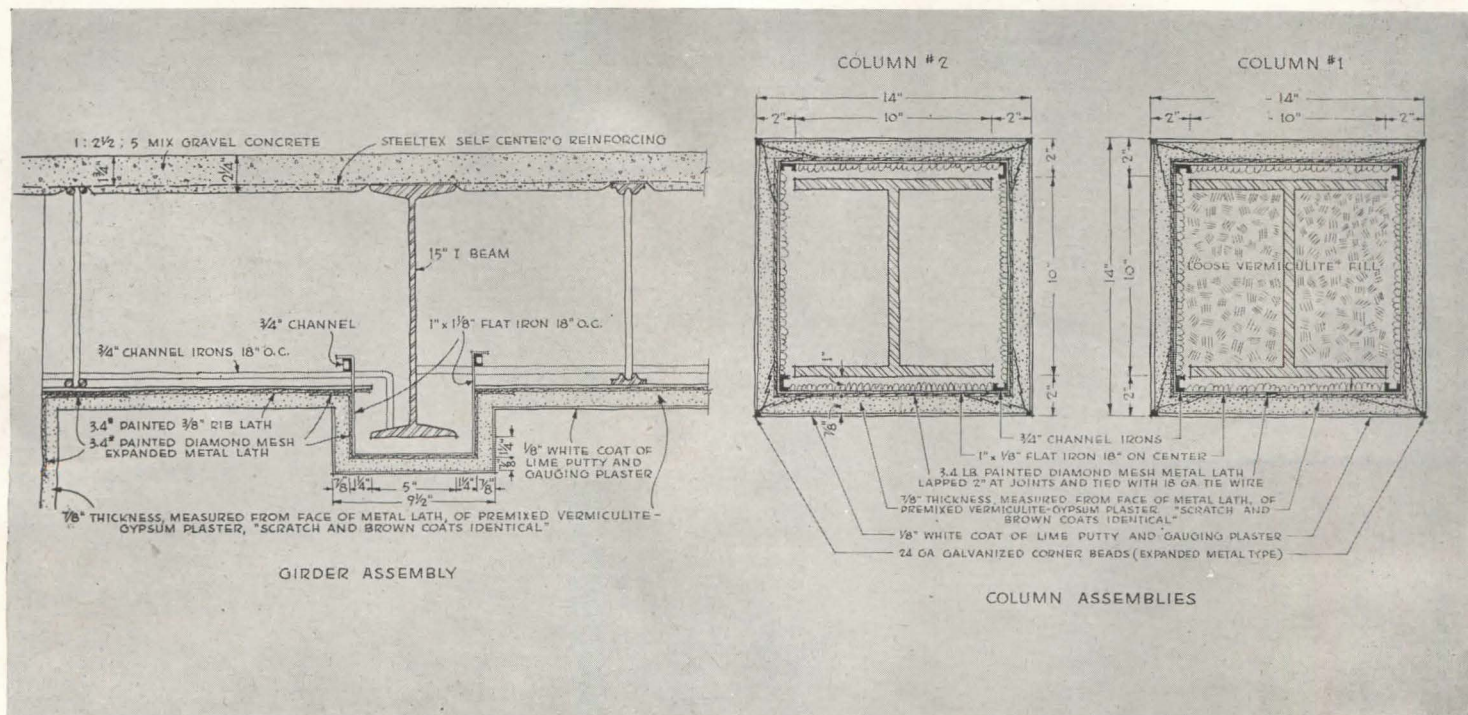
For test purposes an outdoor concrete structure, 13 ft. by 20 ft. in interior dimension, was constructed. The assemblies of floor, girders, and columns were designed and erected to comply with the

Administrative Building Code of the City of New York, and structural minimums were selected so that all heavier construction would be covered if the tests were successful. The test structure was erected by a recognized general contractor and his subcontractors, and received the conventional inspections that would be given by an architect's field representative.

Seven (Type 123) bar joists of six manufacturers, representing expanded, fusion, and resistance-welded types were placed on 24-in. centers with a 4-in. bearing on the furnace walls. Standard anchors and bracing were used.

A typical 15-in. I-beam, 20 ft. long, was also placed on the furnace wall, its upper flange in line with the upper chords of the bar joists. Two 10-in. H-columns, 9 ft. long, were suspended from the I-beam.

The shell above the beams was composed of steeltex self-centering floor reinforcing clipped to the beam and joists and a concrete slab composed of 1 part portland cement, 2½ parts sand, and 5



parts gravel, ready-mixed, poured in place to a thickness of $1\frac{3}{4}$ in. over joists and beam, with a mean thickness of approximately 2 in. To form the ceiling within the furnace, $\frac{3}{8}$ -in. hy-rib 3.4-lb. metal lath was wired direct to the lower chords of the bar joists. No cross channels or furring was used. The I-beam and columns were boxed with 3.4-lb. diamond-mesh lath over $\frac{3}{4}$ -in. channel corners, spaced 1 in. apart from beam and column flanges.

For the purpose of recording temperatures during the test, batteries of thermocouples were installed in the furnace, on the lower chords of joists, on the girder, on each column, and on the slab surface.

FIREPROOFING PLASTER

Vermiculite-gypsum plaster of a standard premixed formula produced under factory control, and tinted for identification, was applied in two coats (scratch and brown) to $\frac{7}{8}$ -in. grounds on furnace walls, columns, and ceiling. A lime putty white coat, $\frac{1}{8}$ in. thick, was applied as a finish coat. The floor, column pits, and interior furnace pylons were constructed of concrete made with 1 part portland cement and 6 parts of expanded vermiculite, job-mixed. No admixtures were used.

Column No. 2 was protected solely by the $\frac{7}{8}$ -in. thickness of vermiculite-gypsum plaster over the face of the lath. Column No. 1 was identically protected, except that a loose fill of expanded vermiculite was poured between the column and lath keys to within 6 in. of the column-beam junction.

TEST RESULTS

The furnace was fired to follow the time-temperature curve prescribed in the Code, rising at the end of 4 hr. and 5 min. to 2007° F. The floor was loaded with 40 lb. per sq. ft. during the test.

At the end of 4 hr. 5 min. the furnace fire provided by two oil burners was extinguished. The average temperature on the joists was 763° F.; on the girder, 736° F.; on column No. 2 (the unfilled column), 1101° F.; on column No. 1 (filled with loose vermiculite), 864° F.; and the surface slab, 263° F. Allowable slab temperature was 329° F. Average temperature of the entire steel assembly was 865° F.

Column No. 2 (the unfilled column) passed the allowable limit of 925° F. in 3 hr. 35 min., winning a 3 hr. rating by a wide margin. All other elements adequately passed the 4 hr. period.

HOSE STREAM TEST

At the conclusion of the fire endurance test, the ceiling was subjected to a hose stream test by the New York City Fire Department. Adherence to 20 ft. standard distance was impracticable because the ceiling of the test structure was only 6 ft. high and the access door, 4 ft. high. The nozzle therefore had to be held much closer to the target, at a distance of only 3 ft. The hose stream was applied for $13\frac{1}{2}$ min. with a nozzle pressure of 30 lb. per sq. in., and at an angle of approximately 40° from the vertical.

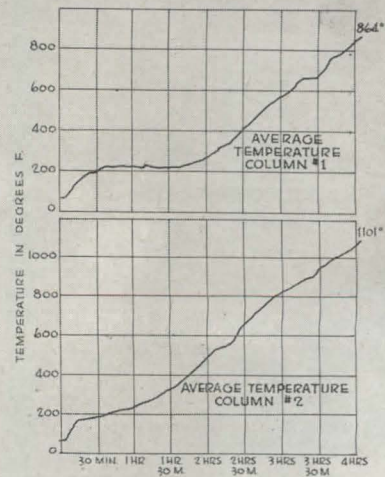
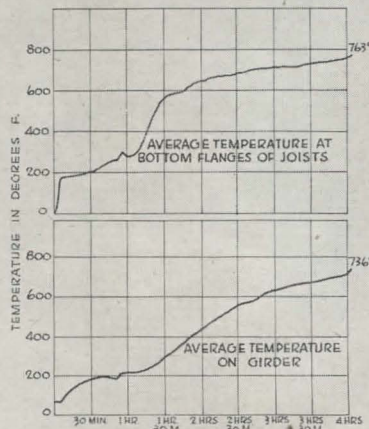
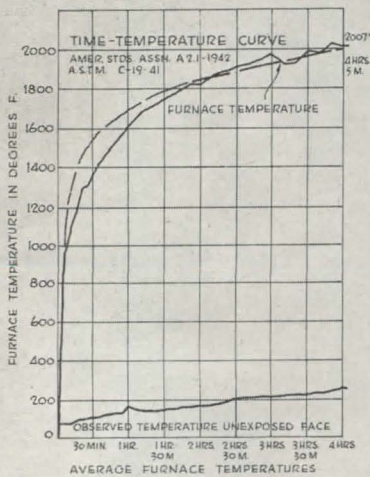
The stream dislodged the plaster extensively on the ceiling, and also dislodged the protection from the tops of

the columns, exposing the metal lath wrapping on the sides facing the door opening. Although the N. Y. Bureau of Standards and Appeals, at this writing, has not published its findings, it is believed that these conditions were brought about by the unusually close range of the hose stream. There was no failure of structural members.

DEFLECTION TEST

Deflection tests during the fire and after the hose stream test were passed successfully. A static load of dry sand was imposed on the floor slab before the fire test, amounting to slightly more than 40 lb. per sq. ft. The day following the test, this live load was doubled and a further weight of 35 lb. per sq. ft. imposed, representing finish floor dead weight, making a total load of 115 lb. per sq. ft. When the steel work was exposed to recover the inside thermocouples, following the test, no warping or distortion of members was observed, nor anything to indicate any difference between performance of resistance- or arc-welded joists.

Test sponsors believe as a result of this demonstration, one of the most severe tests ever attempted, that scientifically controlled and factory premixed vermiculite-gypsum plaster, having a dry weight of not over $3\frac{1}{4}$ lb. per sq. ft., 1 in. thick, is entitled to a high rating for the fire protection of steel structures requiring 4-hr. fire protection. In the case of the columns, a vermiculite fill was required to qualify beyond 3 hr. 35 min. Savings in dead load, over fireproofing practices, are obvious.



AIR-ENTRAINING PORTLAND CEMENT

By C. L. Davis *

AIR-ENTRAINING cement is an improved portland cement. While it is the latest type, it is not new, having been used in many types of construction for seven years. Research on it goes back 11 years.

Before describing some of its outstanding characteristics and properties, a brief statement of the development of air-entraining principles may be of interest.

It was research on paving concrete which led to the discovery of air-entraining portland cement. Extensive research showed that the scaling of concrete pavements caused by the use of de-icing salts could be greatly reduced, and in some cases eliminated, by the use of portland cement in which a small and precise amount of air-entraining agent was interground. As a result of further experience and in recognition of its beneficial qualities, use of air-entraining cement has been extended to all types of concrete construction.

WORKABILITY CHARACTERISTICS

Air-entrained concrete is more plastic, more cohesive, and has considerably less tendency toward segregation and bleeding than does concrete made with normal cement. By segregation is meant the separation of larger aggregate particles from the mortar body during the operation of transporting and placing in the forms. These features are of par-

ticular importance in the construction of concrete walls and columns. Decreased segregation results in more uniform and homogeneous concrete particularly in a heavily reinforced wall, and the minimizing of bleeding lessens the amount of laitance (whitish scum) in the top layer of a pour, giving a formed surface virtually free of sand streaks.

DURABILITY

Resistance to alternate freezing and thawing is considered one of the principal criteria of the durability of concrete. Extensive laboratory tests and field performance have shown that air-entraining concrete possesses much greater resistance to freezing and thawing than normal-cement concrete.

When bleeding or water-gain occurs in plastic concrete, minute channels are left in the interior of the hardened concrete. These channels or capillaries appear as "sand streaks" when they occur in the contact surface between forms and concrete. The air is not in large bubbles but in millions of tiny cells uniformly distributed throughout the entire mass.

It is important to understand this distinction between the nature of the small amount of air present in normal-cement concrete and the air resulting from purposeful air-entrainment. In the latter,

the millions of tiny air bubbles, because of their great surface area, immobilize the free water in the plastic concrete, thereby greatly decreasing bleeding and resulting channels. The combination of fewer channels and the disconnected air cells in the hardened concrete minimizes the opportunity for water to move into and out of the concrete. Furthermore, if some water does get into the air cells, there is space for expansion of ice crystals which lessens the danger of freezing or damaging the concrete.

DESIGN OF CONCRETE MIXTURES

Bulking effect of the entrained air causes an increased volume of concrete so that the quantities of materials that produce one cubic yard of concrete when normal cement is used will yield more than that with air-entraining cement. It is necessary, therefore, to compensate for this increase in yield by adjusting the mix slightly so as to maintain the desired cement content. Because the entrained air greatly improves the workability characteristics and increases the slump, the adjustment of the mix should be accomplished primarily by reducing the sand and water contents.

* Engineer of Tests, Universal Atlas Cement Co. A paper by the author given before the New York Chapter, American Institute of Architects.



RICHARD A. SMITH Photo

New York Port of Embarkation A.P.O. used 390,000 concrete blocks, with improved appearance and increased compressive strength due to air-entrainment. Col. Edgar Garbisch, U. S. District Engineers; Alfred Hopkins & Associates, Architects

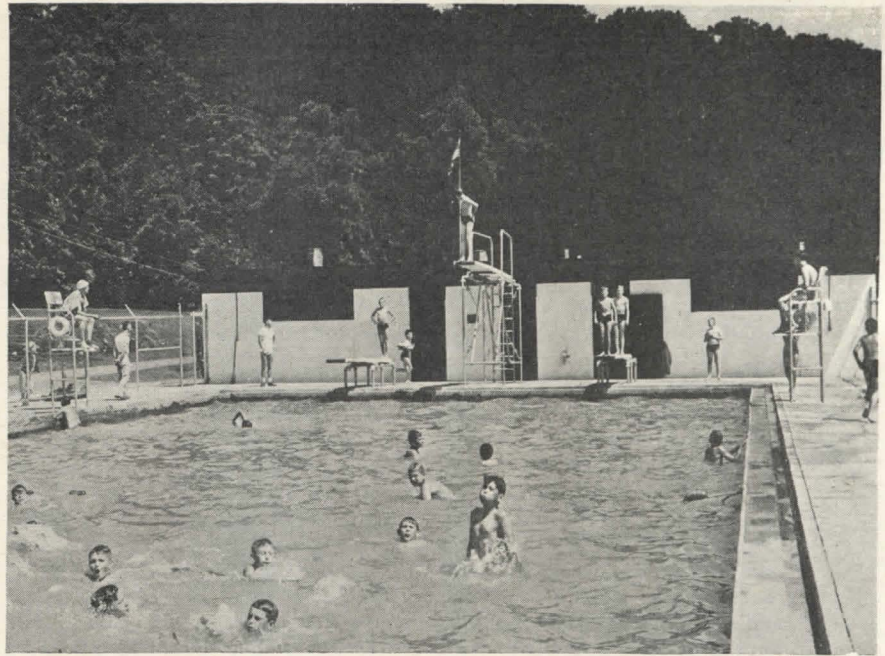
EFFECTS ON COMPRESSIVE STRENGTH

When the mix is adjusted in this manner, the concrete made with air-entraining cement generally has higher strength in lean concrete (4 sacks per cu. yd.) and slightly lower strength in rich concrete (7 sacks per cu. yd.) than does normal-cement concrete of the same cement content. This results from the fact that use of air-entraining cement permits greater reduction in sand and water with lean than with rich mixes.

For years it has been believed by many that the durability of concrete varies with its strength. However, this is not necessarily true, especially in concrete subject to severe exposure. In any event, durability should not be sacrificed for strength. It should also be emphasized that with present-day cement it is possible to make concrete twice as strong as with the cement of 25 years ago; that allowable working stresses have not increased in the same degree; that many building codes still call for 2,000 lb. concrete at 28 days, whereas with present-day cement, either normal or air-entraining, it is possible to secure this strength at 7 days. In the final result, the loss of strength, if any, is less important than the gain in durability and other desirable characteristics.

SPECIFICATIONS

Current specifications for air-entraining cement are those of the American Society for Testing Materials ("Tentative Specifications for Air-Entraining Portland Cement," A.S.T.M. Designation: C 175-46T). These specifications include two types of air-entraining cement—Type IA for general concrete construction, and Type IIA, moderate-heat-of-hardening cement. They contain



Open-air swimming pools demonstrate the durability of air-entrained concrete, since they are particularly subject to freezing and thawing effects of winter weather. Y. M. C. A. Swimming Pool, Cuyahoga County, Ohio, built of air-entrained concrete by Alger Rau, Inc.

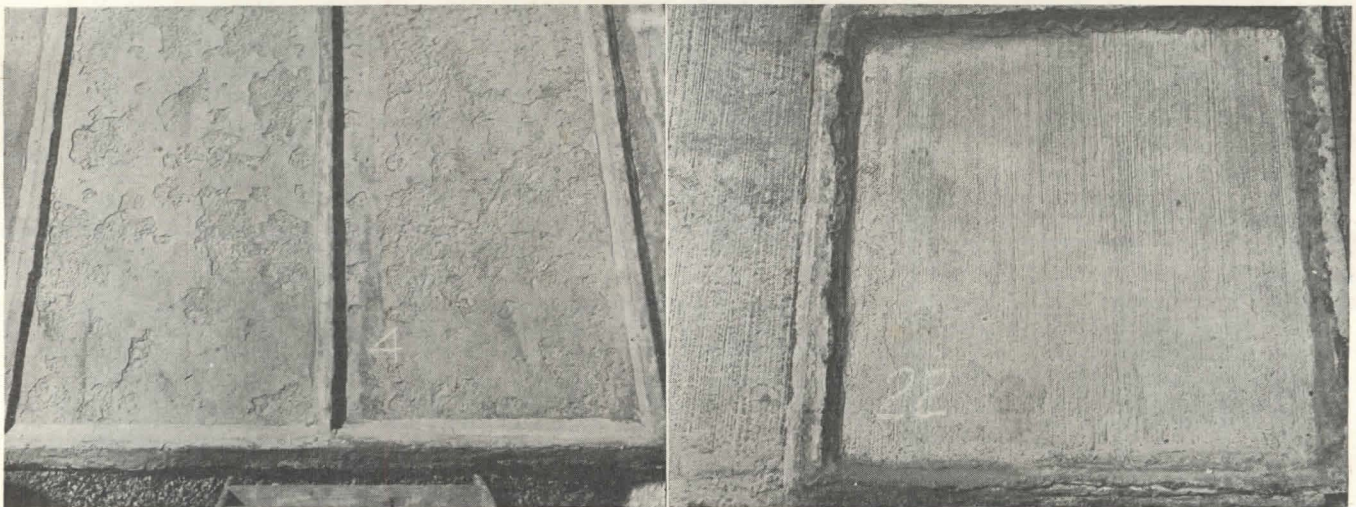
requirements for air content of standard mortar, the purpose of which is to control the amount of air entrainment. These requirements are so set as to result in an air content in fresh concrete of approximately 3 to 6 per cent which is considered the optimum range in order to obtain the desired characteristics and best results.

It is understood that the revised federal specifications for portland cement will be issued shortly and that provisions for air-entraining cements will be included in this revised printing.

APPLICATIONS

Air-entraining portland cement is being used for general concrete work such as foundations, walls, paving, sidewalks, slip-form work, gunite, and in concrete pipe and block. It also is suitable for concrete block and other machine-made, dry-tamped products, where its use makes possible blocks having a dense, rich surface texture and greater compressive strength.

Most portland cement manufacturers produce air-entraining cement. It is sold at the same price as regular cement.



These test slabs were subjected to 60 cycles of freezing and thawing and repeated applications of calcium chloride to melt ice during two winters. Left: The slab made with regular cement shows heavy scaling. Right: Air-entrained concrete remains relatively unaffected

FEE COMPETITIONS AMONG CONTRACTORS?

by J. P. H. Perry, Vice-President, Turner Construction Company

THEORETICALLY an owner proceeding to build on cost-plus-a-fee wants the best contractor obtainable. But there has grown up, at least on the eastern seaboard, a practice of holding fee competitions among contractors. Leading builders are invited to quote lump sum amounts as fees for which they will act as general contractors on a given job.

PENNY-WISE ECONOMY

Most thoughtful men grant, without much argument, that a small difference in fee should not influence their judgment in determining the best qualified contractor. They will insist further that they will not allow their decision to be influenced by a few dollars — (often less than $\frac{1}{2}$ of 1 per cent of the total cost of the project). Nevertheless, human nature being what it is, good resolutions often cease to be either good or resolute when dollars are laid on the line.

Speaking from nearly 40 years experience involving some \$300,000,000 of cost-plus-fee building contracts, I am convinced that owners and architects who choose contractors as a result of competition as to amount or rate of fee do themselves and the building industry a disservice, for they assure for themselves neither the best contractor for the job nor the greatest economy in the long run.

The very men who set up these competitions would be the very last to choose their doctors, surgeons, dentists, lawyers, consulting engineers or any other professional advisers on such a basis. A building contractor operating under a cost-plus-fee contract functions essentially as a professional man. His obligations are to erect the buildings in question at the lowest cost and in the shortest time consistent with good workmanship and the interests of the owner. The contractor's compensation is fixed. In addition to the responsibilities just mentioned, he has a further one to himself, namely, to perform so well that he may have repeat orders or cause other clients to come to him because of reputation acquired. This is just the situation which any professional man faces when he sits down across the table from each new client.

BASE COMPETITION ON MERIT

Consider what would probably happen if General Motors, duPont or Standard Oil had to select a new President or Executive Vice President. Would they be

likely to invite five or six leading candidates to quote the salary for which they would undertake the job, and would they then select the man who named the lowest monthly wage? Or would their Board of Directors rather canvass the field, pick out several eligibles, and finally after interviewing each and looking up his record, decide on the man who was best qualified to serve them, and then having decided on this man take for granted that they could agree on financial terms with him?

Where the position is of less importance, the practice would be to determine a salary rate in advance. The management would then interview candidates and make every effort to determine the best qualified at the price.

In neither case would the employer bargain first about dollars, and second about qualifications.

FIX A FAIR FEE

The best interest of an owner would in my judgment be served if the owner did one of two things:

(a) *Fix the fee* himself and let each contractor under consideration know what the fee was to be, and then discuss the contractor's qualifications. The resulting selection would then be indeed on merit and not on price.

One may ask how owners or architects are going to fix a fair fee. There is ample information available. The Defense Plant Corporation scale of fees, while probably lower than the current market warrants, is a guide. The Mason Builders Association of New York has recently adopted a scale of contractors' fees. Or the owner or architects can talk to any leading builder and see what the general market is. It wouldn't be hard to arrive at the prevailing rate of fees.

(b) Select the contractor after a searching investigation of his qualifications and then negotiate with him as to the fee. Again, the selection would be on reputation, capability, availability and experience, not on dollars.

NO REAL PARITY EXISTS

I have discussed this matter with many men and usually get but one defense of fee competitions: i.e., that only contractors of equal qualifications and ability be invited to submit proposals. But there is no parity within any group of contracting organizations.

Let us analyze this theory, that only equally qualified contractors are in com-

fetition. What constitutes "equal qualifications" among builders? Among the yardsticks most generally used are the following:

1. *Financial Resources and Credit.*
2. *Reputation* in general and integrity, cooperation and fair dealing in particular.
3. *Experience*
 - a. General — years in business or volume of work done.
 - b. Specific — namely, having built similar buildings.
 - c. Local — knowledge of existing conditions is often of much significance in evaluating a contractor.
4. *Organization*
 - a. Is it one of line and staff or is it departmentalized?
 - b. Is it composed of old or young men?
 - c. Is it staffed by men who made the company's reputation or is it "a name" manned by men of other names?
 - d. Is it undermanned or has it reserves and replacements?
5. *Job staff available* and the names, experience records, salary rates of the men to be assigned full time to the specific job.
6. *Project Manager* or No. 1 man on a big job. Are any two men equal?
7. *Plant and Equipment* available and at what rentals. Is the contractor likely to overplant the job?
8. *Labor Relations* — of vital importance these days.
9. *Relations with subcontractors and material men* — Do the subs like to work with this general contractor?
10. *Purchasing Power.*
11. *Time of Completion.*

I have never seen any group of contractors — who certainly know one another better than any owner or architect possibly could — who would be willing to agree on any parity among themselves. Studies of the results obtained by applying the foregoing yardsticks to any group of builders will inevitably show wide variation on nearly all the factors. There is just no such thing as equality among bidders, especially as applied to a specific building operation. Practice certainly disagrees with theory here.

For owners and architects on private work to put the cart before the horse, or actually to put "cartwheels" (\$) ahead of capabilities, is in my judgment far from the correct way to select contractors to work on a fee basis.

PRODUCTS for Better Building



Steel bars for reinforcing concrete feature reverse helical ribs for an improved bond

REINFORCING BAR

Introduced in 1943, the *Hi-Bond* steel reinforcing bar for concrete construction, developed by Inland Steel Company, will soon be available in greater quantities, following the licensing of Carnegie-Illinois Steel Corporation and other subsidiaries of U. S. Steel Corporation to manufacture and sell it. Designed to offer a bearing surface more than double that of usual commercial types, this reinforcing bar features an arrangement of reverse helical ribs that results in a maximum bond between steel and concrete in order to realize the full potential strength of the reinforcing steel. The bar has subsequently been subjected to independent tests conducted by the U. S. Bureau of Standards and laboratories at the Universities of Illinois and Wisconsin, which reportedly show that it contributes to sounder and more economical reinforced concrete construction through an improved bond that makes possible more efficient transfer of stress at splices, better crack control, superior resistance to slip, and an opportunity to design for higher stresses. Inland Steel Co., 38 S. Dearborn, Chicago 3, Ill.

WALL COATING

A new paint, *Tite-Wall*, especially designed for use on concrete and cinder block, but usable on practically any rough, porous surface, is mixed with water, and paints out like an oil. Two coats are said to waterproof exterior block walls and to considerably reduce dampness and seepage even in damp basements. Truscon Laboratories, Inc., Caniff and Grand Trunk R.R., Detroit 12, Mich.

CONSTRUCTION CORE

A new construction material called *Honeycomb* has a cellular core made from paper, cotton or fiberglass, fabricated into blocks resembling huge honeycombs, and then sliced to the desired thickness before assembly. Faces

of metal, wood veneer or plywood are bonded to the core with a plastic thermo-setting adhesive which develops a permanent bond actually stronger than the materials it bonds together. At the present time the material is custom built to specifications, in thicknesses varying from $\frac{1}{4}$ in. to 1 in. It was developed jointly by U. S. Plywood Corp. and the Glenn L. Martin Co.

FAST-SETTING GLUE

A new cold-run fast-setting resin wood glue, *Wood-Lok*, has been developed for joint assembly operations in every type of wood. This resin glue is said to be the only type that can be handled and machined after 20 to 30 minutes' clamping time, instead of the usual six to eight hours, providing a strong, resilient bond unaffected by humidity changes. It is cold-run and therefore its bonding quality is not weakened by constant heating. *Wood-lok* is a liquid, ready for use, and does not harden in the pot. Other announced advantages are that its use eliminates "chilled" joints, and there is no need to heat the glue or the wood; also, that it neither embrittles nor forms a rock-hard abrasive film to dull saws and knives. Colors range from pure white for colorless drying without glue line, to darker shades for special uses. National Adhesives, 270 Madison Ave., New York 16, N. Y.

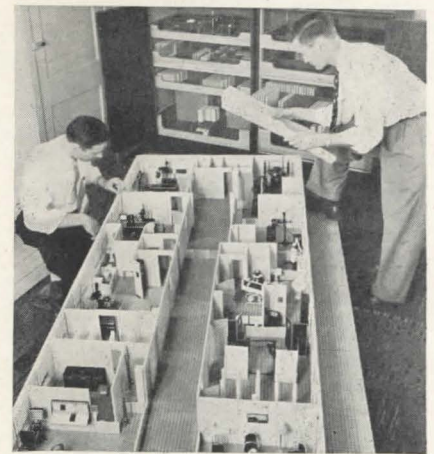
ASBESTOS PLASTER

Ready-mixed and applied in much the same manner as ordinary plaster, *Clap-seal* is a new self-bonding asbestos plastering material, said to provide an exceptional combination of lightweight fire-protection, thermal insulation, and noise reduction. It reportedly will adhere without mechanical binding to any non-oily surface; and finish plasters, porous papers, or water-, oil-, asphalt-, and rubber-based paints may be applied directly to it to improve appearance or furnish added protection. The manufacturer points out that it should not be used where it may be exposed to weather, since its reaction to moisture is similar to that of ordinary plaster, nor where it will be subjected to excessive abuse, since it is somewhat softer than ordinary plaster, and, while as readily patched, will dent under pressure more readily. Brooks Green Co., 673 Boylston St., Boston 16, Mass.

STEEL STAIR UNITS

Recently announced is a pressed steel sectional stair unit which combines tread and riser in one piece of formed metal, punched and slotted so that, according to the manufacturer, a full stairway can be put up in only 90 minutes. This stair

unit is a modification of a steel stair originally developed for manufactured houses. The standard unit is made of 12-gauge steel with an over-all width of 36 in. Two of the units may be placed end to end to form a 72-in. wide stairway. The tread is 9 in. deep and riser, $7\frac{1}{2}$ in. high. A lip extending above the tread has a $1\frac{3}{8}$ -in. slotted hole through which bolts secure the lower unit to the one above. This slot permits adjustment for the height of the rise to the extent of 1 in., from 7 to 8 in. Units are finished in standard gray and may be covered with rubber treads, with carpeting (cemented or secured by carpet rods), or may be painted. Hardware for assembly and instructions are included in each set of 13 units for the stairs and one for the top. Home Ola Corp., 9 S. Clinton St., Chicago 6, Ill.



Model of x-ray laboratory units assists architects in hospital planning and design

X-RAY LAB MODELS

Three-dimensional models, a tool commonly employed by industrial architects and planning engineers for arriving at most efficient utilization of production space, have been adopted by the Westinghouse X-Ray Division to assist in rehabilitating and expanding the nation's war-worn x-ray facilities. Value of replacement and expansion is expected within several years to reach \$35 million a year. In planning a modern x-ray laboratory, the hospital architect coordinates the desires of many individuals. This model permits duplication of existing or proposed facilities in miniatures making possible visual arrangements that are located to the satisfaction of hospital superintendent, radiologist or roentgenologist, operating technicians, and members of the hospital directing board. The model kit contains 1000 individual pieces, scaled one inch to the foot. Models of X-ray equipment, walls, floors, windows, and doors are developed in wood, metal, and plastic. Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Penn.

(Continued on page 138)

MANUFACTURER'S LITERATURE

CHURCH ORGANS

A Practical Approach to the Church Organ Problem. A booklet pointing out the advantages claimed for the Wurlitzer organ in churches of all sizes, with particular stress on the space saving and economical features. Includes technical data about organ placement and selection, and typical floorplans. Also included is a series of scale plans of Wurlitzer organs. 28 pp., illus. The Rudolph Wurlitzer Co., Organ Division, North Tonawanda, N. Y.

DEAERATORS

Cochrane Atomizing Deaerators (Publication 4160). Technical details and application data for the atomizing type of deaerator developed by Cochrane to meet the demand of marine engineers. Includes diagrams and a catalog of accessories. 20 pp., illus. Cochrane Corp., 17th St. below Allegheny Ave., Philadelphia 32, Penn.

ELECTRICITY

Planning Your Home for Better Living Electrically. Home building and remodeling tips for kitchens, laundries, lighting and air conditioning. Selection and location of equipment, decoration, placing of outlets, electrical appliances and conveniences, wiring information, costs. 64 pp., illus. General Electric Co., 1285 Boston Ave., Bridgeport 2, Conn.* 25 cents.

HEATING

Automatic Coal Stoker, Residential Models RB 20, RB 35, and Floor Furnaces, Series 1500. Descriptions, specifications, features and dimension sketches of two models of the stoker, and similar information on one floor and two wall furnaces. 4 pp. ea., illus. Rheem Mfg. Co., Dept. AR, 714 W. Olympic Blvd., Los Angeles, Calif.

The Answer Book on Home Heating. Information for the home owner and prospective home owner on heating and air conditioning; types of system available; thermostats; insulation; solar heating; heating and air conditioning equipment. 28 pp., illus. General Electric Co., Air Conditioning Dept., 5 Lawrence St., Bloomfield, N. J.*

Fitzgibbons "D" Type Steel Heating Boilers. Catalog of boilers designed and constructed according to Steel Boiler Institute Rating Code. How to select a boiler for specific requirements. Complete details on each model in the

line. Engineering tables, diagrams. 12 pp., illus. Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York 17, N. Y.*

Looking Ahead with Oil Heat. By W. A. Matheson. Booklet describing the advantages claimed for oil heating systems and the types of mechanized oil burners now on the market. Four "laws" for correct oil combustion. 20 pp. Williams Oil-O-Matic Division, Eureka Vacuum Cleaner Co., Bloomington, Ill.

Panelaire: The Warm Air Panel Heating System. Design and installation manual for a system of radiant heating using ceiling panels. Calculation and design diagrams and examples, examples of procedure, Btu requirements tables, tables of duct and pipe sizes and c.f.m. capacities. Specifications and complete construction details. 36 pp., illus.

Whiting Stokers (Specification Sheet 608). Mechanical details, specifications and advantages of Whiting H-C stokers featuring horizontal-compression principle. Diagrams of front and rear ash arrangement models. 6 pp., illus. Whiting Stoker Sales Co., 11 S. La Salle St., Chicago 3, Ill.

Wing Products. Condensed catalog of unit heaters, ventilating fans, motor and turbine driven blowers and turbines. Brief description and photo of each piece of equipment, and reference to bulletin giving complete specifications. L. J. Wing Mfg. Co., 154 W. 14th St., New York 11, N. Y.*

INSECTICIDES

Confused About Insecticides? and Pennsalt DDT Emulsion. Two leaflets describing DDT compounds for civilian use — household insect sprays, insecticide powder, livestock spray, and "garden dust." Instruction for use included. Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7.

LALLY COLUMNS

Lally Column Concentric Safe Load Table and Formula for Computing the Safe Carrying Capacity of Light and Heavy Weight Lally Columns. Handy tables, with explanatory notes and diagrams. Lally Column Co. of N. Y., Inc., 211 Lombardy St., Brooklyn, N. Y.

OFFICE RECORDS

Diebold Tested Methods and Equipment for Better Record Management and Protection. Catalog of record files, cross files, safes, cash draw-

ers, metal doors, and microfilming equipment. 16 pp., illus. Diebold, Inc., Canton 2, Ohio.*

PRINTERS

More for the Money: Bruning Model 40 BW Printer and Simple Versatile Modern Bruning Model 158 Developer. Specifications and description of two machines featuring simplicity and compactness. 4 pp. ea., illus. Charles Bruning Co., Inc., 4654 Montrose Ave., Chicago 41, Ill.

SHEET COPPER

Research Solves Problem of Stress Failures in Sheet Copper Construction. A detailed report on the reasons for failures of copper sheet used for gutters, flashings and roofs. Proposed solution, with charts showing effect of shape, temper and gauge on strength, determination of gauge and expansion joint locations for various sizes and shapes of copper gutter linings, and formula for safe critical load. Details of sheet copper installations, with 30 detail sheets giving installation methods for seams, flashings, high and low parapet walls, roofing, gutters, expansion joints, etc. Table of thickness and weight of sheet and strip copper. 92 pp., illus. Revere Copper and Brass, Inc., 230 Park Ave., New York 17, N. Y.*

SILICONES

How to Use DC 996. Description of a high temperature Silicone insulating varnish which cures at ordinary baking temperatures and protects electrical equipment operating continuously at temperatures up to 350° F. Contains instructions on how to apply and cure DC 996; includes tables of properties and specifications. 4 pp., illus. Dow Corning Corp., Midland, Mich.

TEMPERATURE CONTROL

Wheelco Multronic Capacitrol (Bulletin D4-2). Description of a flexible electronic pyrometer controller using two electronic control circuits and featuring instantaneous control action. Lists applications and features, describes the operation, shows typical installation diagrams. 4 pp., illus. Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

TREATED WOOD

Wolmanized Lumber. Description of a vacuum-pressure treated lumber, impregnated with an odorless, paintable, non-corrosive and non-leachable preservative for protection against wood-destroying fungi and termites. Suggestions for use. Diagrams of use in residential construction. 6 pp., illus. American Lumber & Treating Co., 332 S. Michigan Ave., Chicago, Ill.*

(Continued on page 156)

*Other product information in Sweet's File, 1946.



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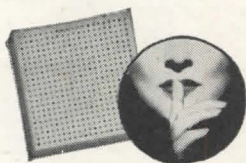
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Most pastors and influential laymen now recognize what forward-looking churchmen have long known—that the music of true bells is the one most effective method of projecting the message of the church to all the community, the one most logical means of giving voice to the beauty of the edifice and the principles it symbolizes. Even when not included in the original plans, a way is usually found to install a carillon later, either through group subscription or the memorial gift of an individual donor.

Too often in such cases we find that the architect has not made proper provision for tower bells. Although a Deagan Carillon is a marvel of compact design, delivering many times more volume per pound of metal than old-style bells, ideal results still call for the observance of a few simple rules as to dimensions and relative height of the tower.

With these facts in mind, we earnestly suggest that you anticipate the installation of genuine bells and make your plans accordingly. To do otherwise may necessitate later alterations or, even worse, encourage the adoption of synthetic loud-speaker music which is entirely out of keeping with the true principles of ecclesi-

astical architecture that you have observed in your design.

★ ★ ★

Our Architectural Service Department stands ready to assist you in making provision for tower bells by sending you detailed information on the dimensions and specifications of a proper bell tower. Please address Department 374, J. C. Deagan, Inc., 1770 Berteau Ave., Chicago 13, Ill.



CHECK LIST ON CHURCHES

These two pages are reprinted from the building questionnaire used by the Archdiocese of Los Angeles. The Archbishop directs that two copies of the information be made, signed by the pastor and architect, and submitted to building committee with plans and sketches. (The actual questionnaire carries a page arranged for noting the approval, criticisms and objections of the Archdiocesan Building Commission.)

PROPOSED CHURCH

Parish..... City.....
 His Excellency approves loan of \$.....
 Estimated parish debt on completion \$.....
 Type of architecture..... Estimated cost..... Sq. foot cost?.....
 Length and width..... Height of walls..... of roof line..... of tower.....
 Construction material..... of roof..... of floor.....
 If concrete — width of walls?..... Reinforced?..... What waterproofing?.....
 If wood or stucco — what termite and dry rot preventatives?.....
 Church faces which direction?..... Main boulevard or car line by side windows?.....
 Bell?..... Chimes?..... What parking provisions?.....
 Estimated number of weeks to complete construction.....

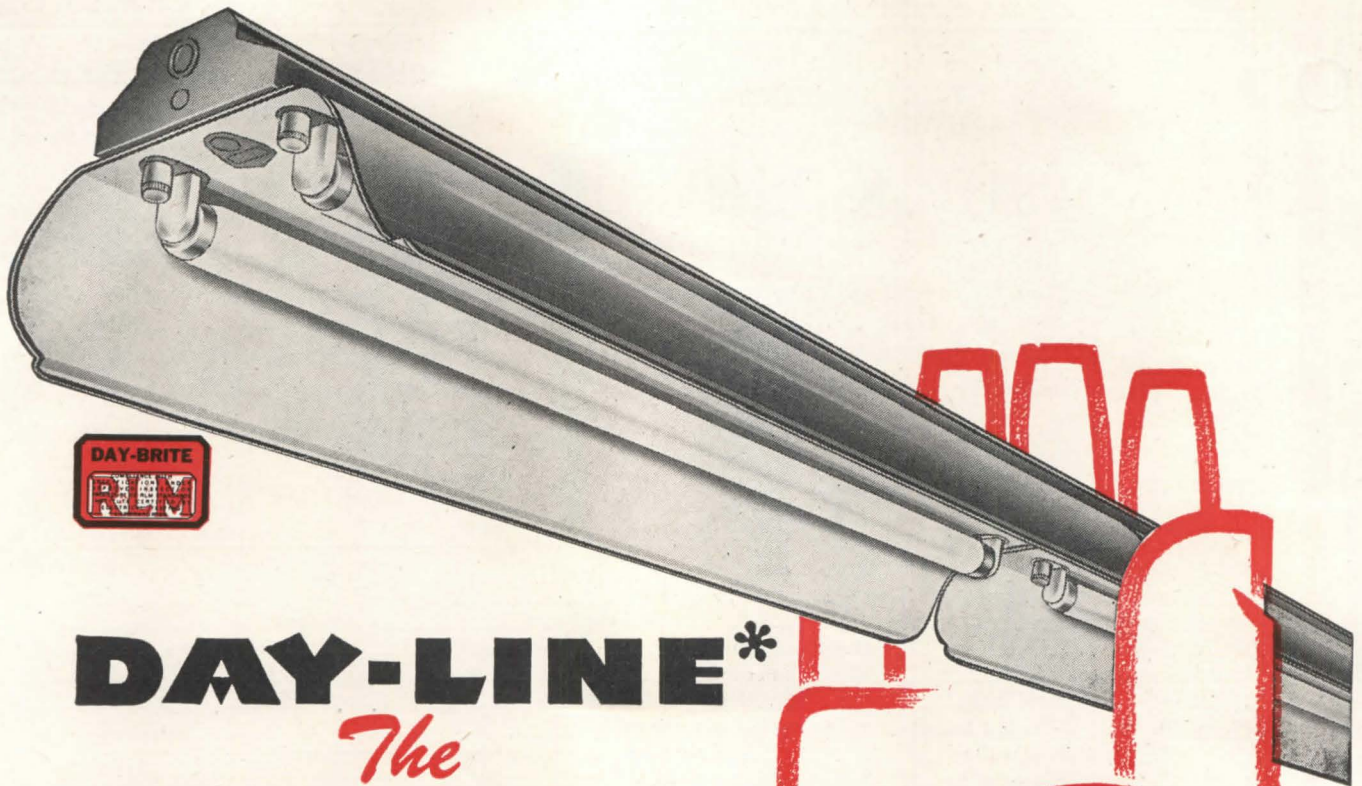
NAVE

Dimensions..... Finish material of ceiling..... of inside walls.....
 Width of main aisle..... of side aisles..... Seating capacity.....
 Floor — level or sloped?..... Number of rows of pews..... Length of pews.....
 Inches between pews — back to back..... Distance from top of kneeler to arm rest.....
 Maximum for comfort 26 inches.
 Number of confessionals..... Dimensions..... Lighted?..... Ventilated?.....
 Sound proofed?..... Hearing aids?..... Dimensions of kneelers and arm rests.....
 Light back of confessor's name?..... Light to show when penitent in?.....
 Number of windows..... Dimensions..... Distance from floor to window sills.....
 Type of church lighting..... How many units..... Where located.....
 Type of heating..... How many units.....
 Where located..... Air Conditioning?.....
 Type of stations..... Size..... Has their location been determined?.....
 Floor plugs provided for cleaning?..... At space for crib?..... At shrines?..... For clock?.....
 Material of altar railing..... Space between altar railing and front pew.....
 If steps at front entrance, has a side entrance at street level been provided?.....
 Will windows open for ventilation?..... How controlled?.....
 Number of pillars..... Has acoustical engineer been consulted?.....

SANCTUARY

Dimensions..... Height of ceiling.....
 Floor material..... Height above nave floor..... Number of exits.....
 Type of altar..... material..... Dimensions.....
 Conforms to rubrics?..... Altar canopy?..... Dimensions of predella.....
 Number of steps?..... Height to altar table.....
 Inches from front to tabernacle..... Tabernacle wired for burglar alarm?.....
 Tabernacle securely bolted to altar?.....
 Side altars..... How many?..... For Mass?..... Dimensions.....
 Niche beside altar for cruets?..... Pipes in floor for flags and banners?.....
 Pulpit?..... Location..... Dimensions.....
 Height above sanctuary floor..... Loud Speaker System?..... Spotlighted?.....
 Number of windows..... Size..... Type of lighting..... How many units.....
 Small wall safe for holy oils?..... Sacring bell?.....

(Continued on page 135)



DAY-LINE*

The
"ONE-MAN"
Fixture

This heavy-duty Day-Brite Industrial Fluorescent system saves time and money on every installation—every service operation:

- One man *alone* can quickly hang the Day-Line with chain or patented Day-Brite "Ice-Tong" hangers.
- Rugged, die-formed steel channels designed for simplified unit or continuous mounting—plenty of knockouts.
- Lifetime porcelain enameled steel reflectors fastened with two captive wing nuts can be removed and replaced in one minute for easy installation and servicing—*without tools*.

Day-Brite Lighting, Inc., 5465 Bulwer Avenue, St. Louis 7, Mo. Nationally distributed through leading electrical supply houses.

In Canada: address inquiries to Amalgamated Electric Corporation, Ltd., Toronto 6, Ontario.

* Patent Nos. 231743, D135375, D133458

944



IT'S EASY TO SEE WHEN IT'S

DAY-BRITE

Lighting

CHECK LIST ON CHURCHES (Continued from page 133)

SACRISTY

Dimensions..... Number of doors to Sanctuary..... Height of doors.....
 Ceiling height..... Convenient entrance for priests?..... For people?.....
 Number of windows?..... of lighting fixtures?..... Floor plugs?..... For clock?.....
 Dimensions of vestment cases?..... of wardrobe cases?..... of free floor area?.....
 Have you planned for lavabo?..... Sacarium?..... Safe?..... Wine closet?.....
 Fireproof cabinet for censer?..... Toilet?.....
 Dimensions of storage space for envelopes..... Pamphlets..... Funeral candlesticks
 Banners..... Laundry, etc.....
 A small squint to be able to see into the church?..... Full length mirror?.....
 Any communication system to choir?..... Vestibule?..... School?..... Rectory?.....
 Will panel for electric control be located so that you can easily tell if lights are working?.....

BOYS' SACRISTY AND FLOWER ROOM

Total dimensions..... Accessible to sanctuary?..... To outside for candle and flower
 delivery, to incinerator, etc.....
 Dimensions of cupboards for cassocks and surplices.....
 Dimensions of storage space for candelabra and vases, etc.....
 For candles and votive lights..... Because of danger of melting, is candle storage space against wall not
 touched by the sun or heating unit?..... For tall vases has a high faucet been specified for sink?.....
 To avoid breakage has wood or rubber drainboard been specified?..... Any provisions for hot
 water?..... Where are storage facilities located for janitor's cleaning equipment and supplies?.....

VESTIBULE

Dimensions..... Dimensions and number of outer doors..... of doors to nave.....
 Number of steps to street level..... Width of treads..... Height of risers.....
 Location of poor box..... Provision for its security?.....
 Dimensions of announcement board..... of space for papers and pamphlets?.....
 Built in holy water founts?..... What arrangement for people to get holy water?.....
 Height of ceiling..... Number of windows..... Number of lighting units.....
 Floor plug?..... Is there any necessity for light standards or lighting fixtures outside the
 church?.....
 Any possibility of an auto entrance under cover?.....
 City ordinance demands toilets connected with church building or adjacent thereto.

BAPTISTRY

Location..... Dimensions..... How lighted..... Floor plug.....
 Wall cabinets?..... Sacarium?..... Locked screen or gates?.....

CHOIR

Location..... Dimensions..... Seating capacity..... Height of railing.....
 Ventilated?..... Lighting provisions?..... Wired for future pipe organ?.....
 For echo organ?..... Blower silenced..... Floor plugs?..... Music storage?.....
 Floor and stairs noise-proofed?.....

SHRINES

How many?..... Where located?..... Dimensions..... How lighted.....
 Will altar be used for Mass?..... What provisions for security of donations?.....

Dated.....

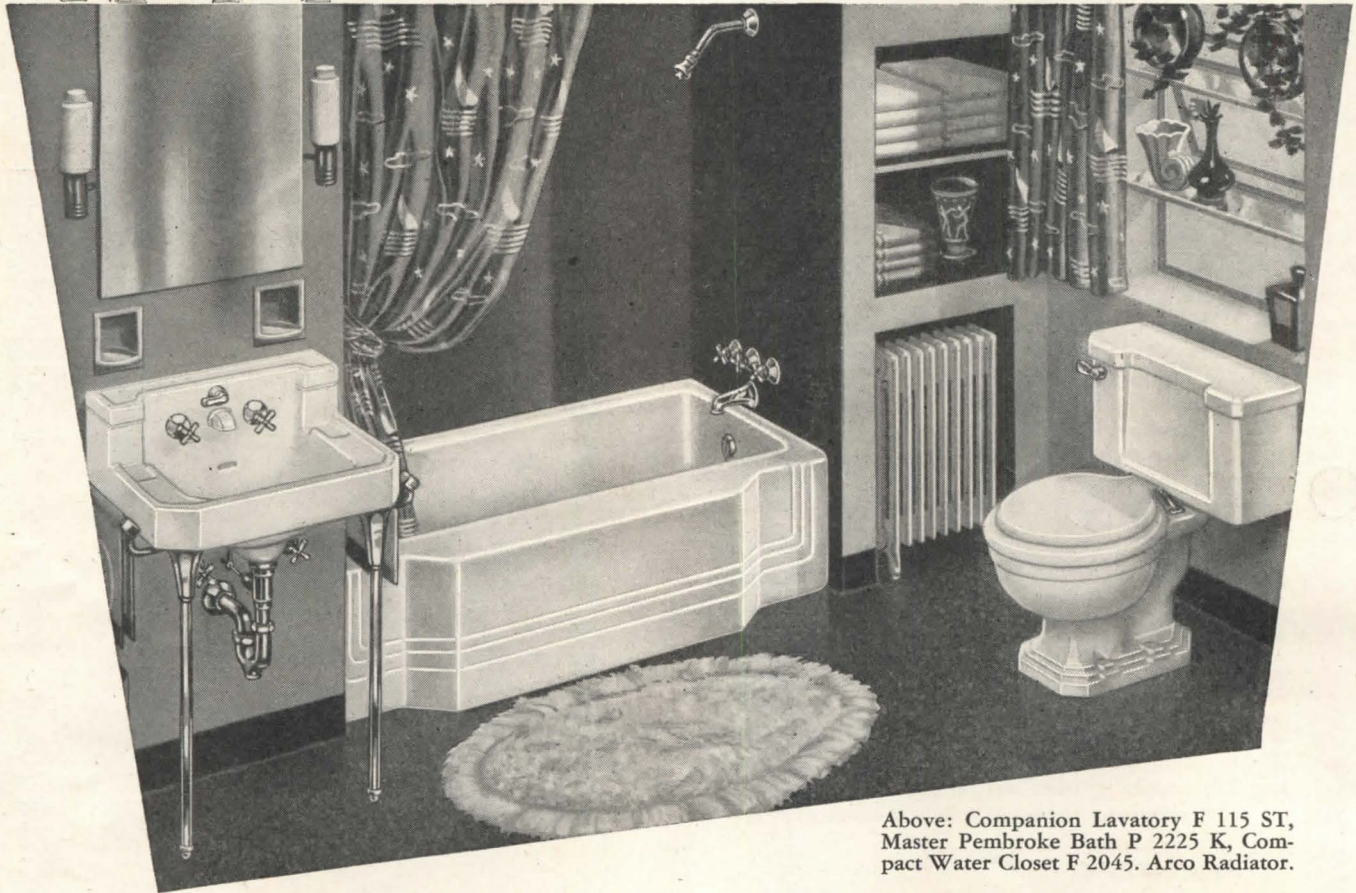
Signed..... Pastor

Signed..... Licensed Architect



Quality fixtures like these
cost no more than others

—and they're just right for today's small homes



Above: Companion Lavatory F 115 ST, Master Pembroke Bath P 2225 K, Compact Water Closet F 2045. Arco Radiator.

WHEN IT COMES to specifying plumbing fixtures for those new homes and modernization jobs, the surest way to please is to recommend American-Standard. No name is better known. No products enjoy greater public acceptance.

The recessed Master Pembroke Bath, Companion Lavatory and Compact Water Closet shown above are typical of the smart, modern styling you'll find throughout the complete line. Like all products bearing the familiar American-Standard Mark of Merit, they are distinguished by their superb craftsmanship, quality materials and sound construction.

With production and delivery conditions improving steadily, you're safe in specifying Ameri-

can-Standard bathroom fixtures, kitchen sinks and laundry trays. Your Plumbing Contractor welcomes an opportunity to figure with you. Fixtures for modernization can be bought on the Heating & Plumbing Finance Corporation convenient F.H.A. Time Payment Plan. **American Radiator & Standard Sanitary Corporation**, P. O. Box 1226, Pittsburgh 30, Pa.

AMERICAN-Standard

HEATING  PLUMBING

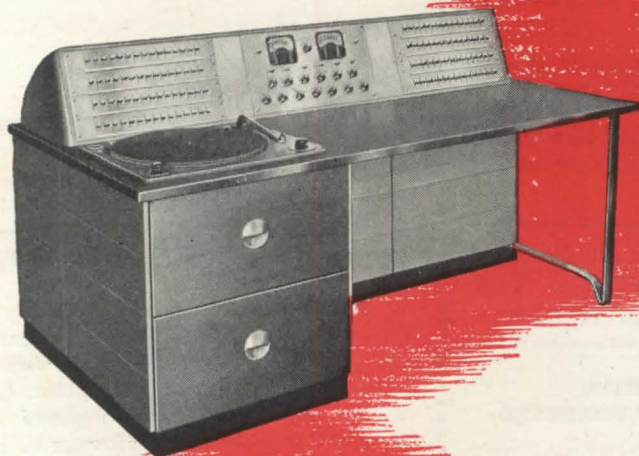
Serving the Nations' Health and Comfort



LOOK FOR THIS MARK OF MERIT—It identifies the world's largest line of Heating and Plumbing Products for every use . . . including Boilers, Warm Air Furnaces, Winter Air Conditioners, Water Heaters, for all fuels . . . Radiators, Convectors, Enclosures . . . Gas and Oil Burners . . . Heating Accessories . . . Bathtubs, Water Closets, Lavatories, Kitchen Sinks, Laundry Trays, Brass Trim . . . and specialized products for Hospitals, Hotels, Schools, Ships, and Railroads

Unit-Built...

RCA MASTER SOUND CONTROL CONSOLES



Master Sound Control Console with Record Transcription Unit and facilities for the distribution of speech and music to loudspeakers in 120 zones.



Master Sound Control Console with two Record Transcription Units, a Radio Receiver and paging facilities for distribution to 120 zones.



Master Sound Control Console provides paging facilities to loudspeakers in 15 to 60 zones.

Whether your problem is sound distribution for a small paging installation or an elaborate plant broadcasting service—you can do it better with an RCA unit-built Master Sound Control Console.

A series of standardized frames and panels are matched to make up distinctly styled basic units. These matched units are so designed that it is possible to assemble them into any desired combination of unit-built Master Sound Control Consoles to fit the job.

No matter what your requirements—record transcription turntable, recorder, radio, or paging—so flexible is this equipment that the right combination of basic units can be provided to give you any or all of these services. As your sound-system needs develop, basic units can be added without discarding equipment already in use.

Built of "matched" units, RCA's Master Sound Control Equipment provides custom-built consoles within the price range of regular production-made equipment. You are assured of dependable performance at lower cost, for years to come.

For full information on the various *unit-built* combinations, write: Dept. 10-J, Sound Equipment Section, RCA, Camden, N. J.



SOUND SYSTEMS
RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N. J.

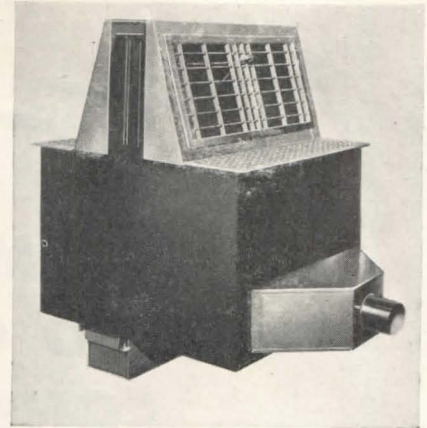
In Canada: RCA VICTOR Company Limited, Montreal

(Continued from page 129)

HIGHER LUMEN RATINGS

Increases in the light output of fluorescent lamps, ranging from the miniature 6-watt lamp to the large 100-watt lamp have recently been announced. These increases, measured by initial (100 hour) lumen ratings, average approximately 5 per cent but run as high as 14 per cent in the case of the 15-watt soft-white fluorescent. Initial lumen ratings of the widely used 40-watt lamp have been

raised 6 per cent for the 4500° white color, 11 per cent for the daylight, and 4 per cent for the soft white. The 100-watt lamp, which is used extensively in industrial installations, has rating increases of 3 per cent for the daylight and soft-white colors and over 4 per cent for the standard white. Similar increases have been made for the smaller 6-, 8-, 14-, 15-, 20-, and 30-watt lamps. Sylvania Electric Products, Inc., 500 Fifth Ave., New York, N. Y.

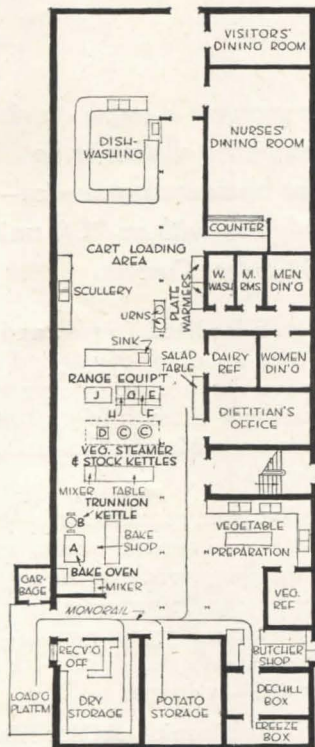


Dual furnace of shallow design is installed below floor without basement or pit

KITCHEN PLAN NO. 37:

Thirty-seventh of a series of successful mass-feeding kitchen plans.

This plan has been designed for an "off-the-track" hospital of 125 beds, located near a small city in the West.



**KEEP FOR
HANDY
REFERENCE!**

COOKING EQUIPMENT PROPOSED:

- (a) 1 No. 982 BLODGETT GAS-FIRED BAKING OVEN.
- (b) 1 20 gallon trunnion kettle
- (c) 2 Stock kettles
- (d) 1 Vegetable steamer
- (e) 1 Solid top skeleton range
- (f) 1 Open range extension
- (g) 1 Open top skeleton range
- (h) 1 Deep fat fryer
- (j) 1 No. 959 BLODGETT GAS-FIRED ROASTING and GENERAL COOKERY OVEN.



This layout was designed with an eye toward adequate cleaning space and the elimination of employee fatigue. In addition to patients and a staff of eighty, provision has been made for supplying meals to a limited number of visitors. The No. 982 Blodgett Bake Oven is an eight-pan, two-section unit, and the No. 959 an oven with two sections, one with two 7" compartments and one with a 12" compartment.

The G. S. BLODGETT CO., Inc.

50 Lakeside Avenue

Burlington, Vermont

The new Deluxe edition of Case Histories is ready—write for it now!

FLOOR FURNACE

Dual floor furnace, Model D-45000, is of shallow flat-bed construction. The fire-box is only 18 in. deep, so the furnace can be hidden below floor level and installed without the need of basement or pit. Shallow depth and welded construction are said to provide safeguard against danger of flooding in rainy season. Installation is made by cutting specified size holes in floor and wall, and slipping the furnace into place. Grills are so designed that no patching or painting is necessary afterwards. Pilot and burner valves are equipped with safety locks. This model has a 45,000 Btu input. Model D-55000, next in production, will have a 55,000 Btu input. Furnaces have the seal of approval of the American Gas Association. Royal Heaters, Inc., Dept. AR, 1024 Westminster Ave., Alhambra, Calif.

SINGLE-SEATED VALVES

A new line of single-seated fully balanced diaphragm regulating valves is being manufactured for process industries and power plants. These diaphragm valves are made with cast iron, bronze, and steel bodies for steam, air, or gas pressures up to 1000 psi., and are designed to be actuated by standard pressure or temperature instruments or controllers using 20 psi. air or clean water. Supplied as standard equipment with 800 Brinell hardened stainless steel main valves and stilted seat rings, they are said to provide equal or greater capacities than most double-seated regulating valves of the same size, and to have the additional advantage of being absolutely tight in dead-end service. For temperatures over 450° F., steel diaphragm valves are equipped with *Condenseal* cooling bonnet, designed to provide a large radiating surface and a reservoir of condensate to help keep the stuffing box temperature down. Leslie Co., 57 Delafield Ave., Lyndhurst, N. J.

(Continued on page 140)

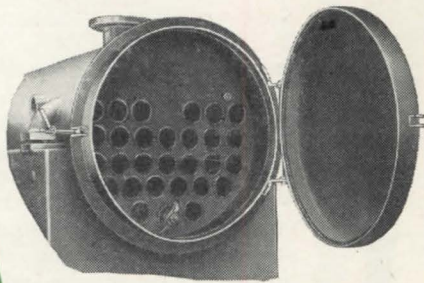
TITUSVILLE

Compact STEEL HEATING BOILERS

ARE EASY-TO-CLEAN
AND EASY-TO-KEEP CLEAN

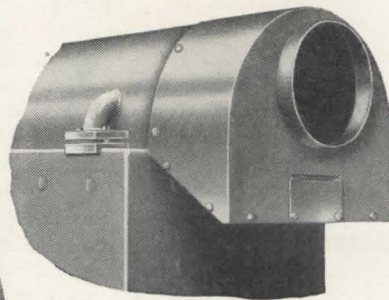
KEEP A STEEL BOILER CLEAN AND YOU WILL ADD MANY YEARS TO ITS LIFE

SMOOTH SURFACES



For cleaning the waterlegs, four 3" x 4" handhole openings (one at each corner) make it possible to flush out all water surfaces; while the shell can be blown clean under pressure through the clean-out opening in the rear circulator. An additional handhole opening is provided at the bottom of the front head and manholes in all sizes having shell diameters more than 48". Two 2½" blow-off openings at the water line are provided in all sizes. Write for Bulletin No. 3000-A.

All tubes are readily accessible through the full width front flue doors.



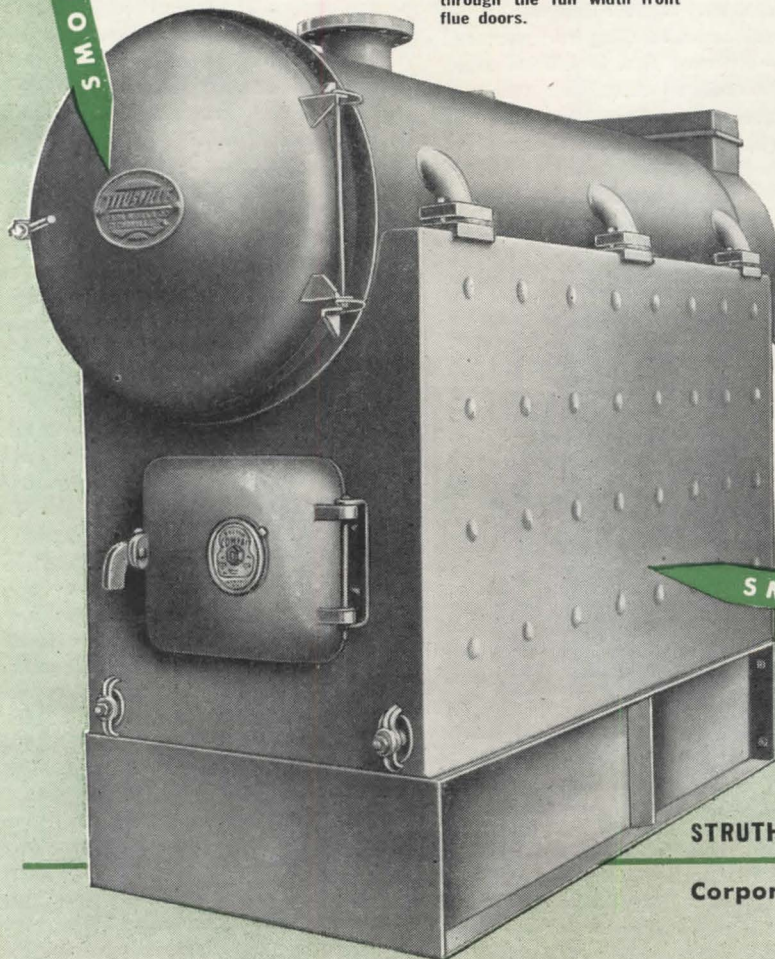
The bottom of the rear smoke box slopes away from the upper tube bank so that soot accumulations can quickly be removed through the smoke box clean-out opening.

Member of



Reg. U. S. Pat. Off.

SMOOTH SURFACES



STRUTHERS WELLS

Corporation

TITUSVILLE
IRON WORKS DIVISION
TITUSVILLE, PENNA.

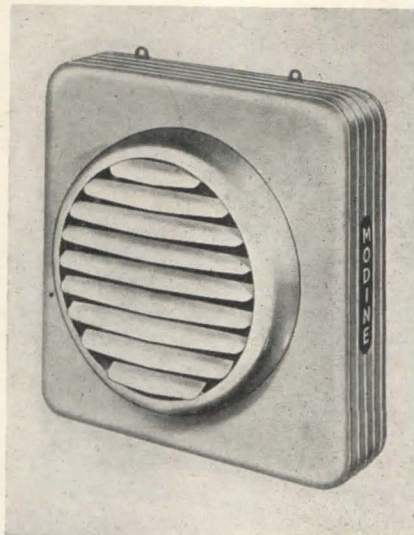
(Continued from page 138)

WOOD-METAL LAMINATE

Sheet metal with a thin wood veneer, formerly called *Decorative Armorply*, will henceforth be known as *Flexmetl*. This is the new laminate consisting of a hardwood veneer, only 1/85th to 1/28th of an inch thick, bonded to a sheet of metal. The finished material is reported to be flexible to the limit of the sheet metal used. U. S. Plywood Corp., 55 West 44th St., New York 18, N. Y.

PROPELLER UNIT HEATERS

A new and restyled line of propeller unit heaters has been announced featuring three distinct types of units with a total of 47 basic capacities. To the conventional horizontal and vertical delivery types, there has been added a powerful new draw-through unit which provides horizontal discharge of heated air over an extra-long range. Known as the *Power-Throw*, this type has special-



Draw-through heater has extra-long range

ized applications, and may be used alone or in combination with the horizontal or vertical type. All are available in standard models as well as in models designed to provide low-outlet air temperatures when used on steam pressures of 30 lb. or more. Models specifically designed for hot water application and for drying and processing jobs are also included in the new line. A wide range of heat throw patterns is available through the use of air-distribution devices, such as deflectors and louvers. All models in the new line are currently finished in beige-gray enamel with chrome trim. Modine Mfg. Co., Racine, Wis.

COLOR GUIDE

Architects, decorators, and their clients frequently encounter difficulties in making color selections. Often a client will be given some color chips furnished by the manufacturer and will narrow his selection down to two colors, following this with the request, "Now, I'd like a color in between those two." Or the home owner selects a color from a mix in the wet state, and is disappointed with the variation shown upon drying. The *Moleta Architectural Color Guide* displays 150 different colors, each shown on a large page measuring 9 by 15 in. The guide is said to prove a boon to architects because the formula for obtaining each particular color is given clearly on the reverse of each color sheet. Colors are shown as they will appear in the dry state. Monroe, Lederer & Tausig, Inc., 606 North American St., Philadelphia 23, Penn.

NEW NAME

Announcement has been made of the change in name of Sanimetal Corporation to Vikon Tile Corporation, which will continue to manufacture steel wall and ceiling tile of various colors. Vikon Tile Corp., Washington, N. J.

(Continued on page 154)

Win Lasting "Client-Goodwill"

INTERIOR TRIM

Create more Visible Value
with KINTRIM Essential
Metal Mouldings

KINTRIM allows you free play in graceful modern design . . . and wins lasting recognition for your creative touch by adding more "visible value" to your interiors. For KINTRIM—the lustrous metal mouldings of *enduring beauty*—has the structural precision you want . . . you need for more attractive, practical use of colorful, serviceable coverings. Indeed, wherever you install linoleum, wall- and floor-coverings, KINTRIM smartly enriches and

accents the beauty of your design.

As experienced, leading contractors recognize—KINTRIM Stainless Steel and KINTRIM Alumilited Aluminum sections surpass ordinary metal mouldings in protective service. They're precision-made, in a complete range of gauges, to fit specific weights of covering materials. And, to protect hands and clothes against snagging, every KINTRIM Stainless section embodies Kinkead's special Safety Rolled-Edge.

FACING for Counter and Table-Tops, Shelves, Cabinets, Sinks



CAP and COVE for Counters, Sinks, Wall-Coverings



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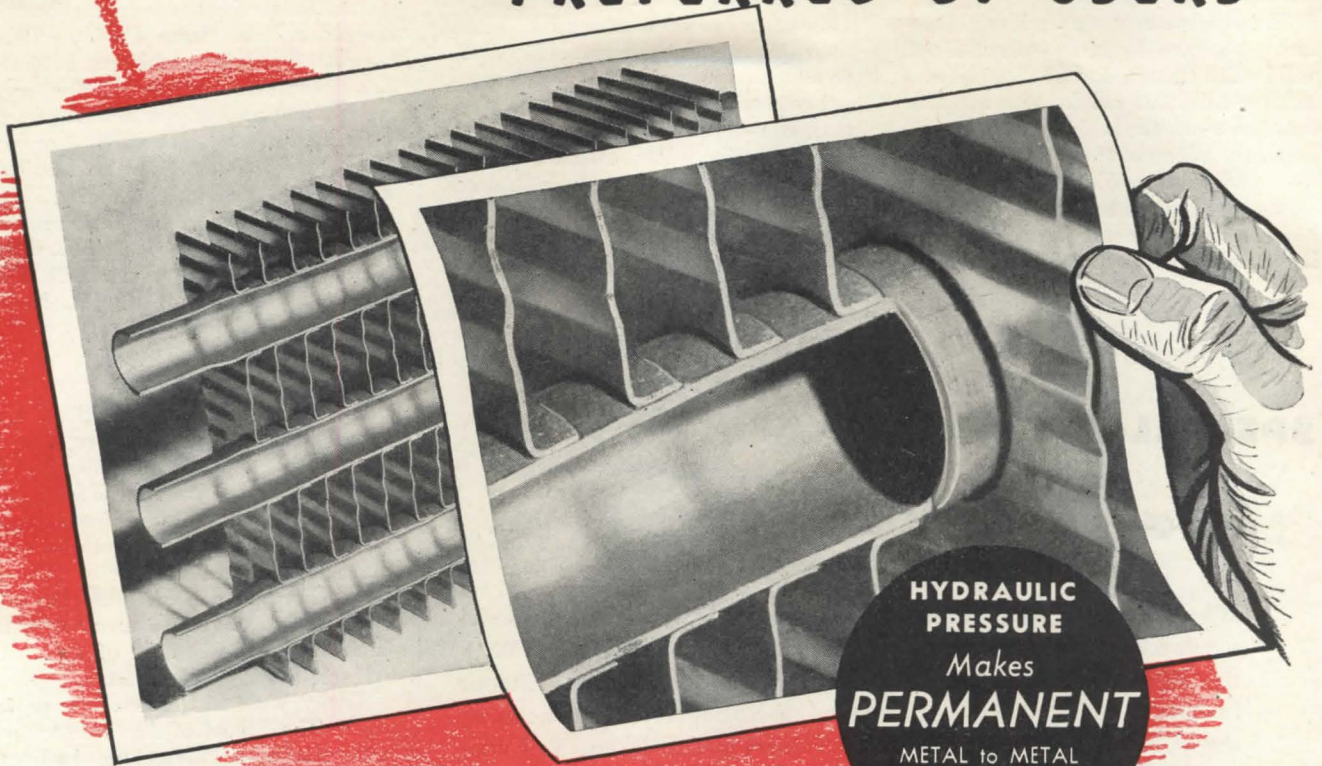
440-450 W. SUPERIOR STREET, CHICAGO 10, ILL.

Let KINTRIM beauty and utility serve as your creative finishing touch that adds more "visible value" . . . and wins clients that speak for you. Write us, Dept. 10R, for reprint of KINTRIM section, *Architects' File*, 1946 *Sweet's Catalog*.

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**HYDRAULIC
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METAL to METAL
BOND

McQuay
**HYDRAULICALLY
EXPANDED**

RIPPLE FIN COILS

Permanent contact between tubes and the *entire* surface of the fin collars—that's the advantage of hydraulic pressure used to create the lasting mechanical bond on McQuay Ripple Fin Coils. And this significant advantage is a typical example of how a seemingly small detail in engineering design plays an important part in making a superior product.

McQuay construction means higher flexible strength with less air friction and cleaner operation. To provide maximum flexibility, all headers are of non-ferrous tubes, thus reducing the problem of unequal expansion and contraction.

These exclusive features make McQuay performance possible and establish their preference among users. McQuay coils are available in a wide variety of styles and sizes, both standard and special coils for steam, hot water, cold water, brine, direct expansion and other applications. For complete information write McQuay, Inc., 1605 Broadway Street N. E., Minneapolis 13, Minn.

McQuay



.... AIR CONDITIONING
EQUIPMENT ESPECIALLY
DESIGNED FOR INDUSTRY

extensive postwar building program, was started early last month.

The new building, six stories and basement, designed by Holabird and Root, will be 220 ft. long and 50 ft. wide, containing 1,001,600 cu. ft. with a usable floor area of about 56,500 ft. It will house the offices of the chancellor, president and vice presidents, the secretary of the board of trustees, the comptroller, bursar, business manager and purchasing office, the dean of students, registrar,

admissions, student counseling and the university examiner. The university's radio office and studio also will be housed there, along with the alumni office, public relations and university postoffice.

Foundations will be pile footings. Frames and slabs will be reinforced concrete, exterior walls cutstone, and the roof tile. Interior finish will be plastered with the walls painted; ceilings will have acoustic tile; floors will be terrazzo in public and asphalt tile in office areas.

Construction Program

Construction of five new buildings for the State Agricultural and Technical Institute and the College of Ceramics at Alfred University has been approved by the New York State Postwar Public Works Planning Commission. Projected are a home economics building, gymnasium and auditorium, farm mechanics building and an industrial shop and laboratory building for the Institute, and an industrial design building for the College of Ceramics. The total program will cost an estimated \$1,236,662, will be under the direction of Haskell, Con-sidine and Haskell of Elmira, N. Y., architects for the project.

Appointments

Oscar D. Rickly, an Ohio State University staff member for more than 25 years in the industrial engineering department, has been advanced from associate professor to a full professorship.

Charles A. Miller, assistant director of the School of Architecture of International Correspondence Schools, has been appointed to serve as a member of the Civic Design Committee of the Pennsylvania Society of Architects.

Sidney Wahl Little, associate professor in The School of Architecture and Arts, Alabama Polytechnic Institute, has been named dean of the School of Architecture and Allied Arts, University of Oregon.

ON THE CALENDAR

October 7-11: National Exhibition of Gas Appliance Manufacturers and Annual Convention, American Gas Association, Atlantic City, N. J.

October 10-12: 13th Annual Meeting and 1st Annual Exhibit on Building and Maintenance Products, National Association of Housing Officials, Carter Hotel, Cleveland, Ohio.

October 29-November 1: 4th All-Industry Refrigeration and Air Conditioning Exposition, Cleveland Public Auditorium, Cleveland, Ohio.

November 11-16: 39th Annual Convention, National Association of Real Estate Boards, Atlantic City, N. J.

November 17-22: 27th Annual Meeting, American Welding Society, Hotel Ambassador, Atlantic City, N. J.

November 18-22: 28th Annual National Metal Congress and Exposition, Municipal Auditorium, Atlantic City, N. J.

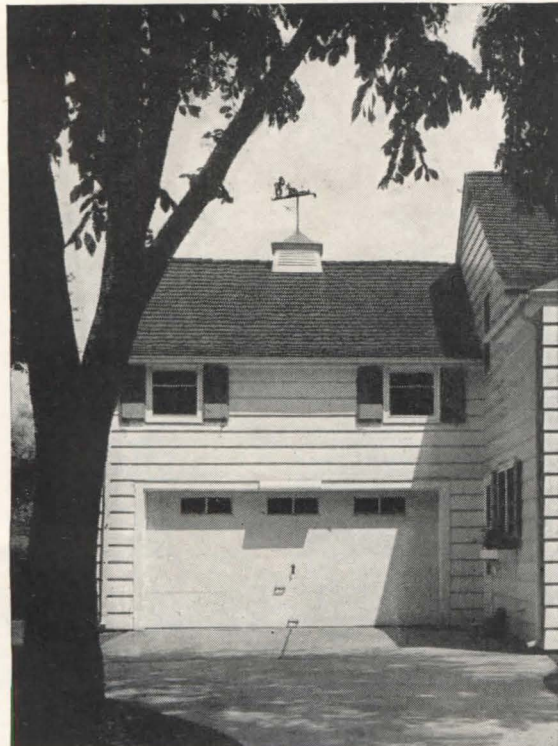
December 2-7: 17th National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.

January 23-26, 1947: 2nd Conference and Exhibit, Low-Pressure Division, The Society of the Plastics Industry, Edgewater Beach Hotel, Chicago.

January 27-30: 28th Annual Conven-
(Continued on page 144)

WHEN YOU NEED
SPECIAL-DESIGN GARAGE DOORS
SPECIFY
Barcol OVERDOORS

Where standard panel arrangements would clash esthetically, special sections can usually be made to complement the exterior design. With this added distinction you keep the outstanding Barcol OVERdoor features . . . tailored twin-torsion counterbalancing, roller-crank closing action, self-latching bolts, continuous vertical track brackets. Talk with your Barber-Colman representative about the possibilities . . .



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IT'S BUILT FOR

Beauty

Modern in design with beautiful chrome finish.



IT'S BUILT FOR

Duty

All working parts are of heat-resistant non-corrosive bronze.



...AND IT'S "tops" IN

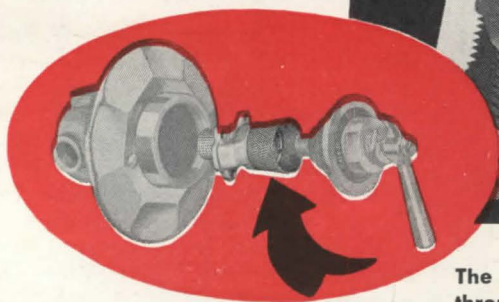
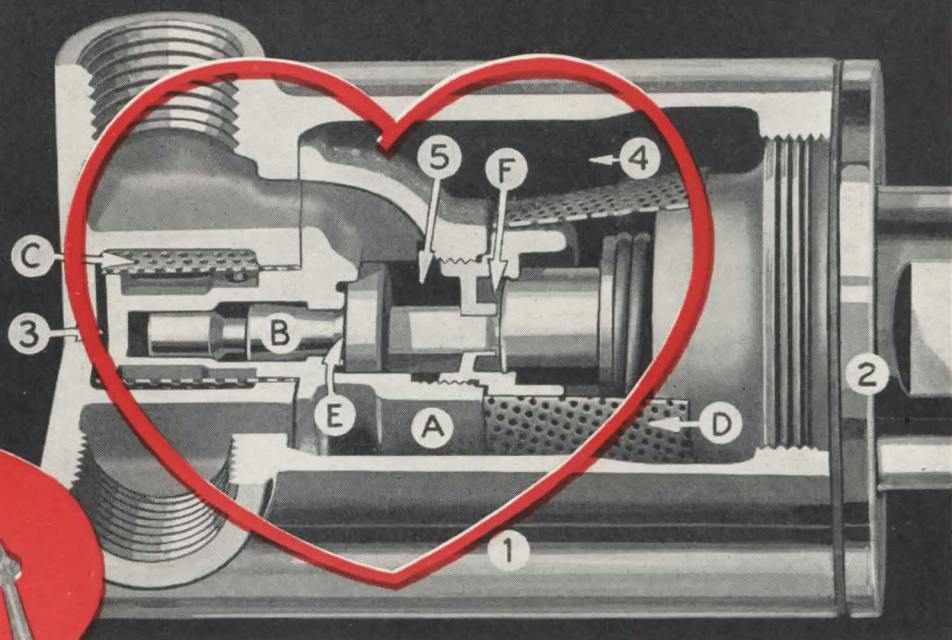
Shower Protection

No accidental scalding; hot water shuts off when cold water fails.



Josam *scald-preventing*
MODERATOR **SHOWER** **MIXING VALVE**
 WITH *exclusive* **HEART-OF-VALVE** CONSTRUCTION

1. One-piece bronze body
 2. Removable bronze bonnet
 3. Cold water chamber
 4. Hot water chamber
 5. Mixing chamber
- "Heart-of-Valve" consisting of:
- A. Cage carrying operating mechanism
 - B. Hydraulic-type shuttle valve
 - C. Bronze screen protecting cold water port
 - D. Bronze screen protecting hot water port
 - E. Neoprene cold water valve seat
 - F. Neoprene hot water valve seat



Maintenance is simple and easy. All working parts are combined in the "heart of valve" unit easily accessible by removing valve bonnet. Old unit can be removed and new unit installed in a jiffy. "Heart of valve" renewal units are available in individual packages.

The Josam Moderator Mixing Valve assures *lasting* shower bathing pleasure through simplicity of construction. A single moving part—the hydraulically operated shuttle valve—keeps hot and cold water "in balance" at the selected temperature and prevents accidental scalding. This shuttle valve is enclosed in the "heart of the valve"—a unit in which all working parts are combined. Even after years of wear or rough usage, there is no need of expensive replacement. All you do is replace the old "heart of valve" with a new one...and the valve is as good as new! The Josam Moderator Mixing Valve is ideal for residences, apartments, schools, colleges, hotels, clubs, institutions, factories, or wherever shower bathing is a regular routine. Fits readily into all standard shower installations. Send coupon below for complete details today!

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tion, The Associated General Contractors of America, Inc., Stevens Hotel, Chicago.

January 27-31: 7th International Heating and Ventilating Exposition, Lakeside Hall, Cleveland, Ohio.

January 27-31: Electrical Engineering Exposition, and Winter Convention, American Institute of Electrical Engineers, 71st Regiment Armory, New York City.

January 28-February 2: 3rd Annual

Plastics Show and Convention, The Society of Plastics Engineers, Navy Pier and Congress Hotel, Chicago.

May 5-11: 2nd National Plastics Exposition and Annual Convention, The Society of the Plastics Industry, Coliseum, Chicago.

ON CHAIR DESIGN

In the first issue of the "Streamliner," a newsheet published occasionally by Egmont Arens of New York, is the fol-

lowing description of the work of a modern industrial designer:

"The Industrial Designer's job is to make the machine better to serve man. . . . For instance, for the last few months we have been working on a machine for sitting — commonly known as a chair. We have been spending a lot of time trying to make that chair more comfortable than any chair any body ever sat in. A large order, because people's rear ends come in the most amazing assortment of sizes and shapes. You might say that technically our effort is to get the least common denominator of the human fanny. So we have staged a sit down strike of our own. We asked all and sundry to sit down on a piece of clay, until we got composite impress of their nether ends. For artistic inspiration we induced some of Powers' most glamorous models to sit in our embryo chair. This phase of the development was very popular with the boys on our staff, who took measurements of some of the prettiest tails in our town. As you know, our building is full of photographers, hence 'through these portals pass some of the most beautiful women in America.' If we have captured only a small percentage of the pulchritudinous curvatures that were impressed in our clay, our chair will rank among the greatest, and Egmont Arens will march down the ages with Heppelwhite, Sheraton, and Chippendale."

OFFICE NOTES

Offices Opened, Reopened

Sidney F. Bamberger, Engineer, and John Lyon Reid, Architect, have opened offices under the firm name of Bamberger and Reid at 110 Market St., San Francisco 11, Calif., for the practice of architecture and structural engineering. Both men formerly were associated with the Ernest J. Kump Co. of San Francisco.

Marcel Breuer has announced the opening of a new office for architecture, planning research and design at 438 E. 88th St., New York 28, N. Y.

Erich Gnant, Residential and Commercial Designer, has reopened his offices at 3331 W. Lisbon Ave., Milwaukee 8, Wis.

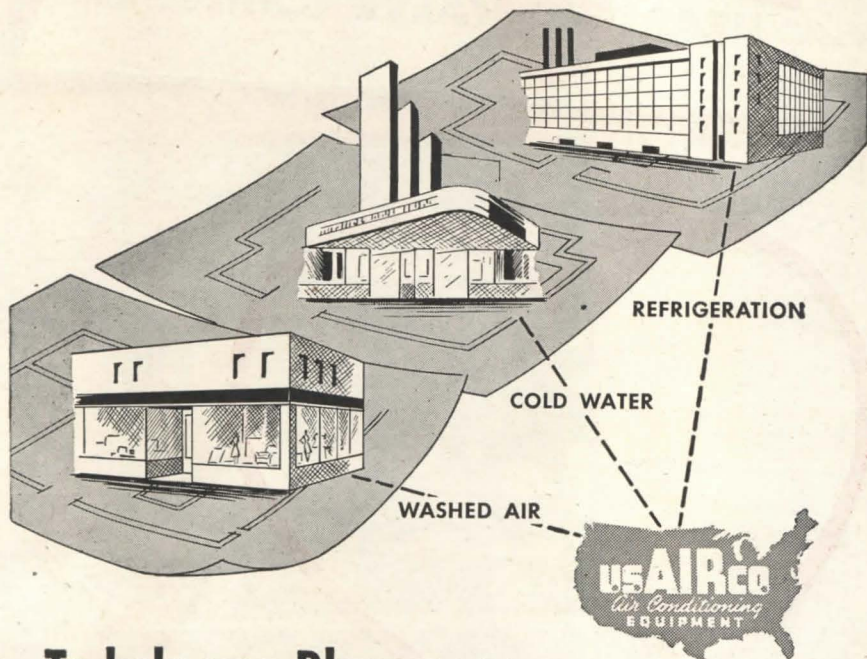
S. Porter Graves, Jr., and Walter D. Toy, Jr., have opened offices for the general practice of architecture as Graves & Toy, Architects, at 1100 S. Clarkson St., Charlotte, N. C.

Thomas E. Greacen, II, Architect, has announced the opening of his office at 1010 Winbern St., Houston 4, Tex.

Don Hatch, Architect, has reopened his office at 207 E. 32nd St., New York, after duty with the U. S. Marine Corps.

J. Lawrence Hopp, A.I.A., has resumed the practice of architecture, with offices at 654 Washington Rd., Mount Lebanon, Pittsburgh 16, Penn.

(Continued on page 146)



**To help you Plan every...
AIR CONDITIONING JOB**

● As in the past, engineers, architects and contractors today look to usAIRco for the right equipment for each job.

Whether it be an economical washed-air cooling system, a cold water unit for deep well operation, or a refrigeration system for complete air cooling and dehumidification, there's a usAIRco system engineered for your job. Year 'round air conditioning is also available, cooling in the summer and heating in the winter.

usAIRco systems are designed for "packaged" installations, central station systems, or remote type units. Auxiliary equipment such as unit heaters, heat

coils, centrifugal blowers, fans, evaporative condensers provide you with complete system responsibility. It will pay you to get in touch with your usAIRco representative . . . take advantage of specialized experience and engineering leadership.

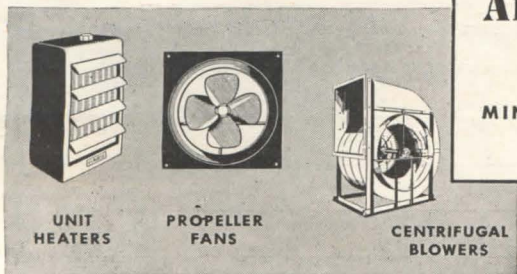


Factory Representatives
in Principal Cities

**United States
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Corporation**
MINNEAPOLIS 14, MINNESOTA



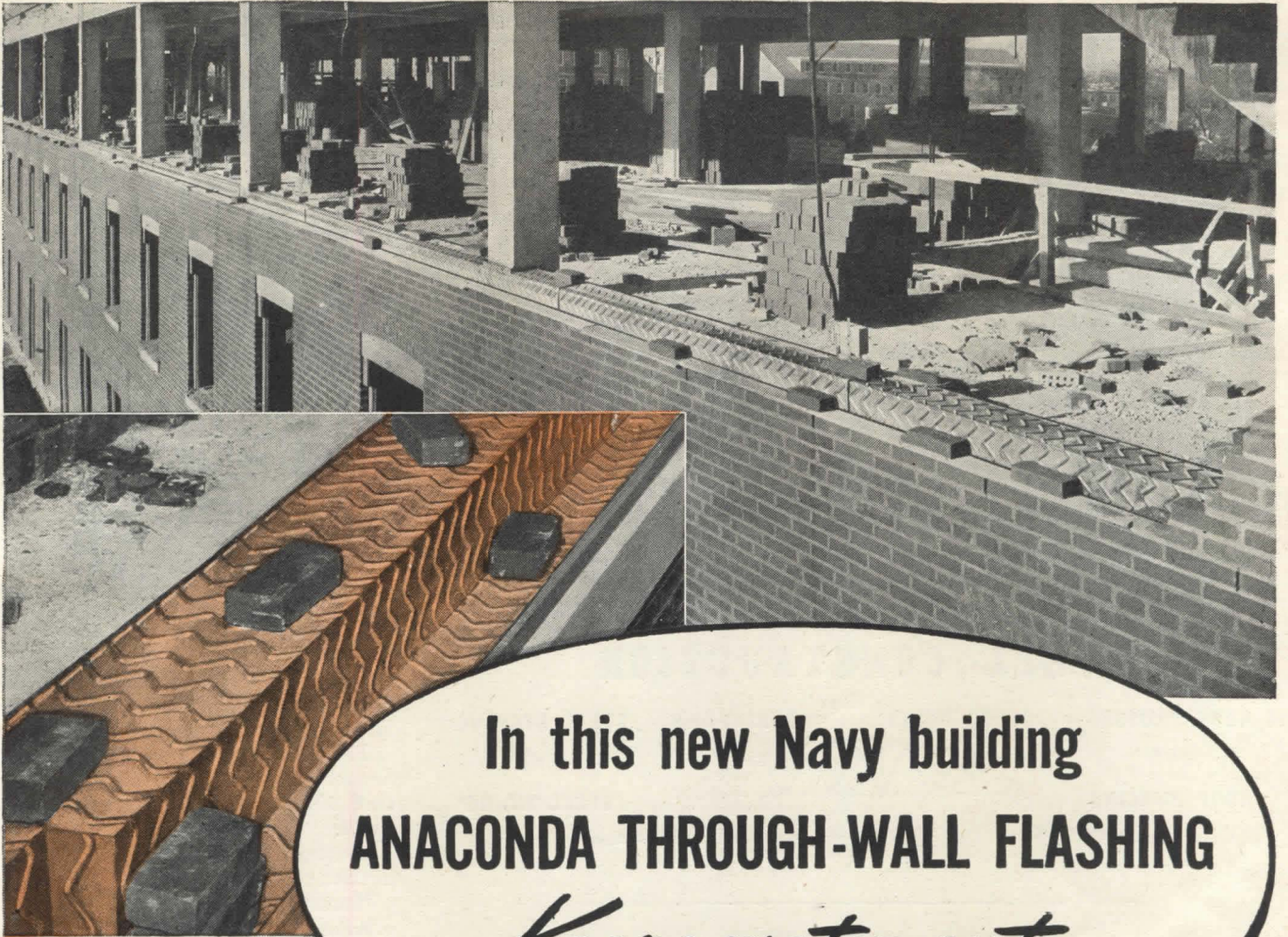
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UNIT HEATERS

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In this new Navy building
ANACONDA THROUGH-WALL FLASHING
Keeps water out

Anaconda 16 oz. Through-Wall Flashing in spandrel applications on new Navy building. J. D. Hedin Construction Co., Washington, D.C., General Contractor.

IN THE NEW Navy building illustrated above, the J. Edw. Linck Sheet Metal Works of Washington, D. C., installed 6,500 lb. of *the flashing that drains itself dry . . .* Anaconda Through-Wall Flashing.


This exceptionally effective flashing has been chosen for commercial, industrial, educational and institutional buildings throughout the country, because it offers these exclusive advantages:

- 1.** Pre-stamped dam and corrugations which provide positive drainage.
- 2.** Dam so designed that edge can be placed within 1/4 inch of face of wall and still allow for pointing of mortar joint.
- 3.** Flat selvage in which sharp bends can be made without distorting flashing.

4. Readily locked endwise to form thoroughly water-tight joints, by nesting one or two corrugations.

5. Corrugations provide a strong bond with mortar, and prevent lateral movement.

Write for Publication C-28, which contains complete description and specifications; or refer to Sweet's Architectural Catalog. 4085

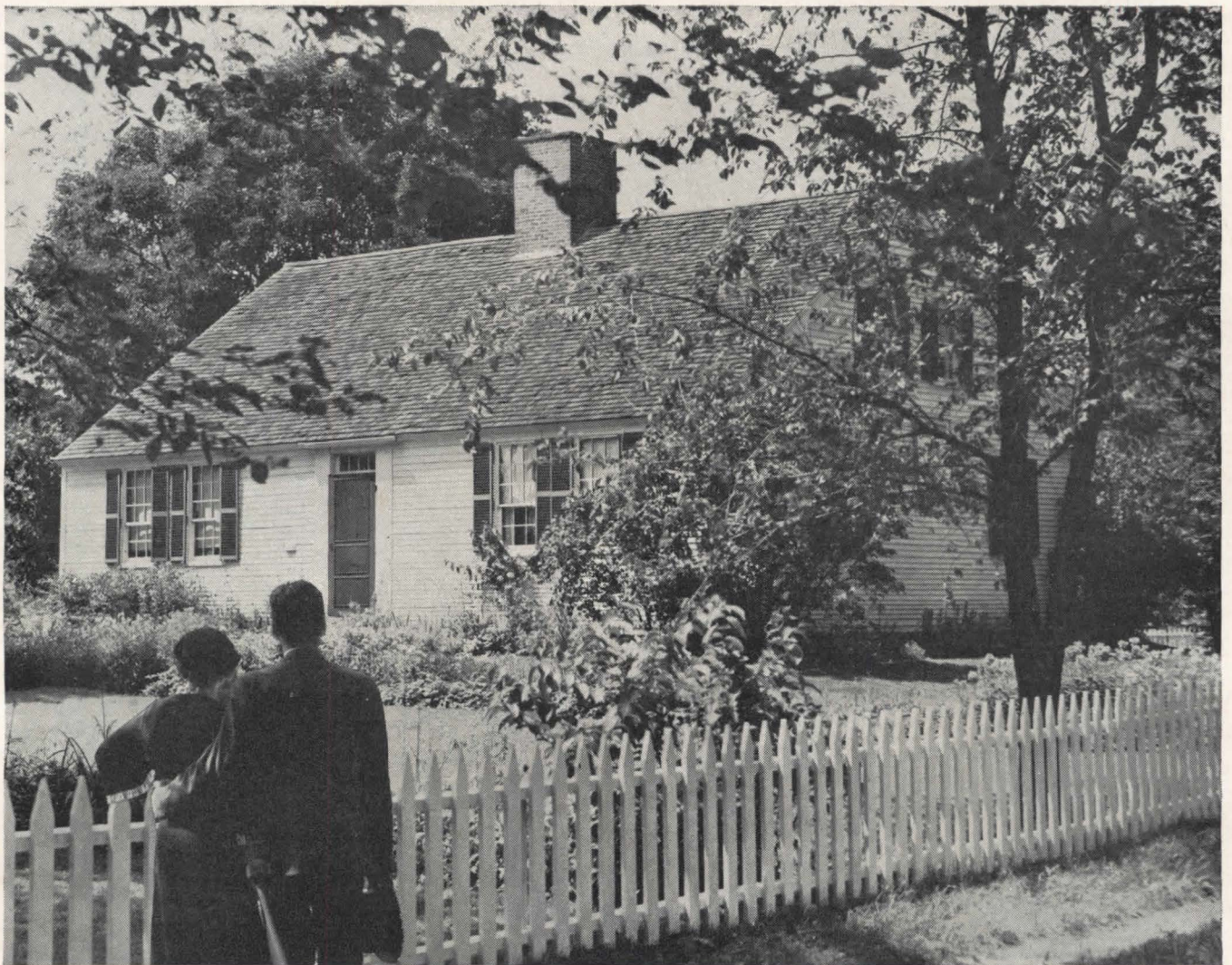


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 New Toronto, Ont.



"Be it ever so humble . . ."

Somehow you *know*, without being told, that the author of "Home, Sweet Home" was an American . . .

For the simple beauty of his song so exactly expresses the love which Americans have for *home*. An attitude, both strong and reverent, born in the cabins of pioneer ancestors and guarded zealously through generations that followed. From American hearthstones the spark of independence was fanned to quenchless flame, and a succession of great men and women emerged to carry its light abroad in the land.

To people who thus cherish the *ideal* of home, the expression of its *physical form* is no less important. So American homes have become

the wonder of the world! Here, the home of the Colonel's lady and Judy O'Grady differ in size, location and pretension, but seldom in facilities for necessity or convenience.

One development, perhaps more than any other, makes this possible . . . the invention and mass production of *steel pipe*.

Yes, *steel pipe makes it possible!* The conveyance of fresh, pure water from its source, however distant, to and through the home . . . for drinking, cooking, bathing, laundering, cleaning and sanitation. For providing conventional heating or the advantages of the newly developed *radiant* heat. For cooling in summer. For fire protection . . . for a hundred-and-one uses.

Durable, reliable, economical . . . *steel pipe* makes these comforts of home available to *all!* That's why 90% of all home piping is *steel piping*.

The interesting story of "Pipe in American Life" will be sent upon request.

*Committee on
Steel Pipe Research*

OF

AMERICAN IRON AND
STEEL INSTITUTE

350 Fifth Avenue, New York 1, N. Y.

STEEL PIPE MAKES IT POSSIBLE!



. . . better living through pipes of steel for plumbing and heating purposes.

Will your new school provide for change?

Here's a proved system of interior construction that offers complete flexibility to meet ever-changing educational needs



THINK OF IT! . . . the entire interior of a school completely flexible, yet having all the necessary qualities of permanent and solid construction!

Think what that means in terms of economy alone . . . when you want to expand or subdivide units, or convert a building from academic to vocational, or from grade school to junior high!

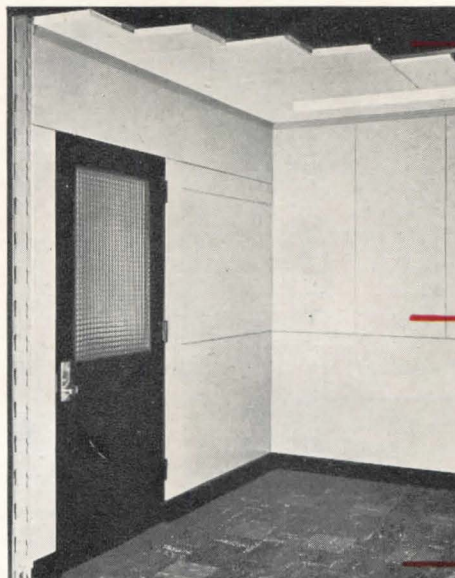
Three Johns-Manville materials make this revolutionary development possible . . . permit Unit Construction of walls, ceilings, and floors under a single specification, a single manufacturer's responsibility:

1. **Movable Walls** . . . 100% salvageable. Made of Transite sheets—difficult to mar, highly resistant to shock and abuse.
2. **Acoustical Ceilings** . . . reduce noise, increase classroom efficiency. Demountable units can be taken down and relocated as desired.
3. **Colorful, Resilient Floors** . . . quiet to walk on; easy to clean; stand up under heavy traffic. Small units permit easy extension of the floor to meet changing conditions.

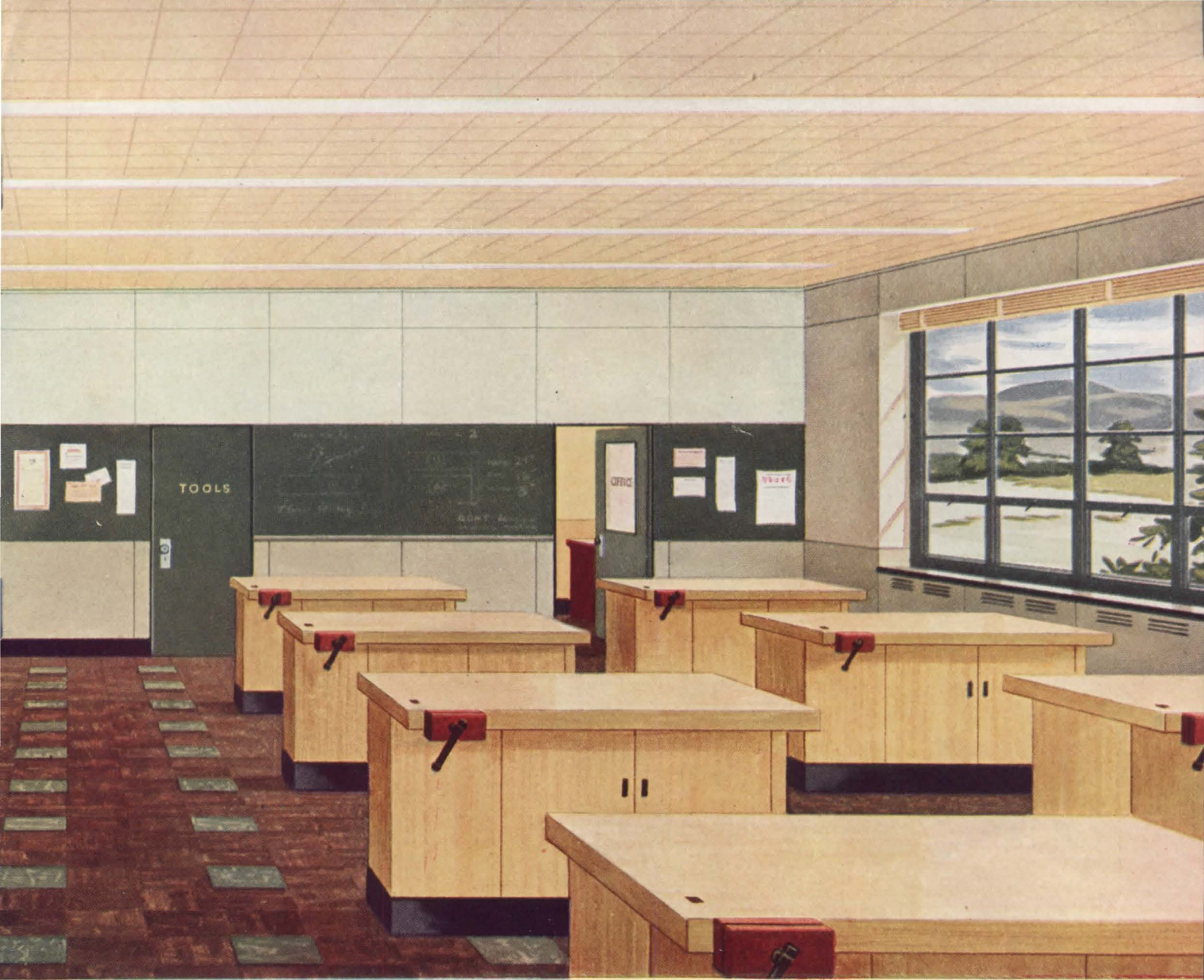
The constituent parts of Johns-Manville Unit Construction are built to last as an integral part of the structure. And they're so much easier to keep clean that they bring maintenance expense way down. Their modern attractiveness inspires genuine pride on the part of students, teachers, and parents.

Before planning a new school or converting an old one, write for our brochure describing this important step forward in school design. Johns-Manville, P. O. Box 290, New York 16, N. Y.

Because of the unprecedented demand for Johns-Manville Building Materials, there may be times when we cannot make immediate delivery of the



With Johns-Manville Walls, Ceilings, Floors, you can keep expanding, converting, or subdividing schoolroom units as often as conditions require



1. ACOUSTICAL CEILINGS—Important factor in helping to overcome the handicap of distracting noise, Johns-Manville Acoustical Ceilings are beneficial both to teacher and student alike. They give the desired degree of quiet for effective teaching, eliminate frequent causes of nervousness, and are proved aids to concentration. An exclusive *Johns-Manville* patented construction system permits interchangeability of flush-type fluorescent lighting and acoustical ceiling units, which are readily demountable.

2. MOVABLE WALLS—The keystone of flexibility in Unit Construction is the J-M Transite Wall. It can be disassembled and relocated as educational needs require. One-unit rooms, for instance, can be speedily converted into two-unit rooms, or vice versa. Made of fireproof asbestos and cement, practically indestructible materials, the movable panels are used to form rigid, double-faced partitions, 4" thick. Can also be used to finish the interior of outside walls. Transite base is easily removable for access to wiring, etc.

3. COLORFUL, RESILIENT FLOORS—J-M Asphalt Tile Flooring completes the Unit Construction System. Made of asbestos and asphalt, the units withstand the kind of hard wear and abuse that must be expected in any school building. Not only durable, J-M Asphalt Tile Floors are comfortable and quiet underfoot, reducing the disturbing effects of noisy footsteps in corridors, gymnasiums, etc. Individual units permit easy alterations or extension of patterns. Made in a wide variety of plain and marbled colors.

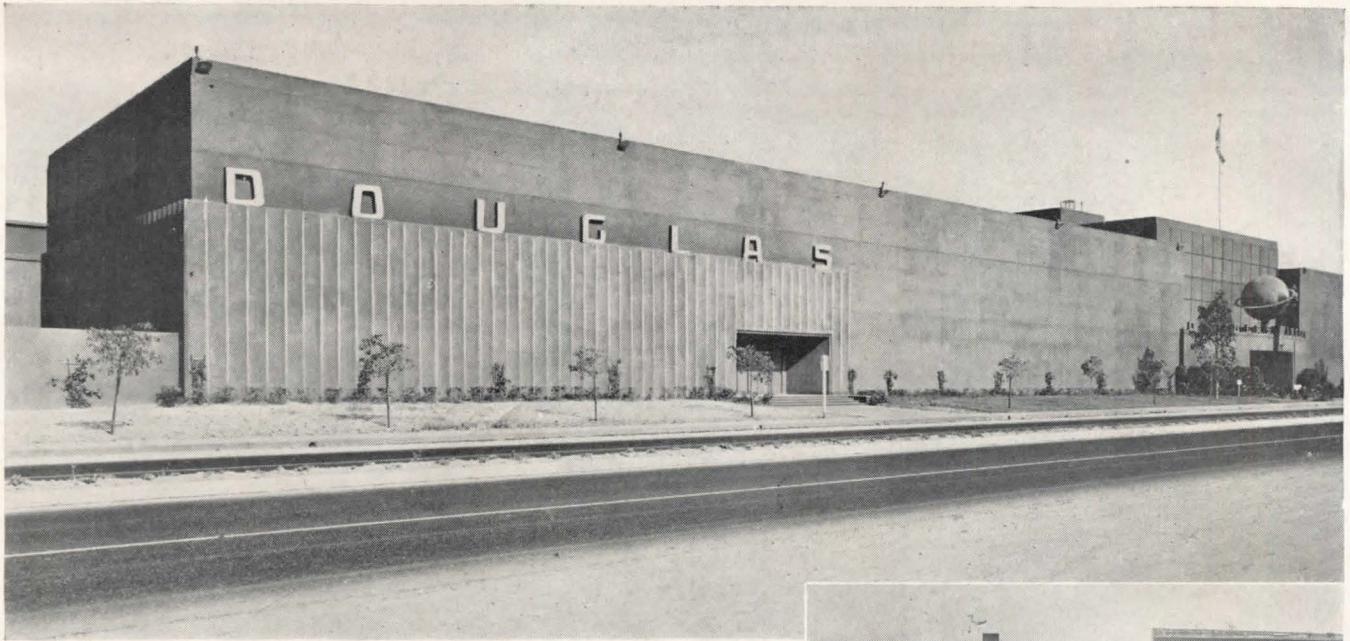
Incredible as it may seem, this beautiful and solidly built Vocational Room can easily be expanded, subdivided, or converted to an ordinary classroom—thanks to the flexibility of Johns-Manville Unit Construction. Note the projection-free lines of the movable, hard-to-mar Transite Walls. And note the Acoustical Ceiling (with fluorescent lighting), which cuts down noise and reverberations that would otherwise distract students and teachers in other rooms. The colorful floor is Asphalt Tile, easy to clean, highly resistant to scuffing, yet resilient underfoot.



**Johns-Manville
Unit Construction**

for schools

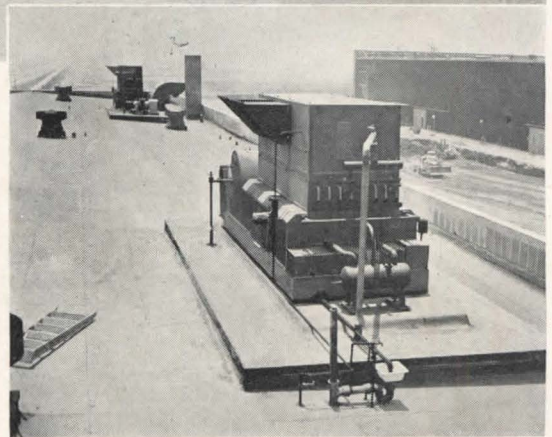
**ASPHALT TILE FLOORS
MOVABLE TRANSITE WALLS
ACOUSTICAL CEILINGS**



Main administration building of the Douglas Long Beach plant: Taylor and Taylor, Architects; O. W. Ott, consulting mechanical engineer. Contractors were Great Western Refrigeration and Engineering Co., and W. S. Kilpatrick and Co., both of Los Angeles.

Largest "Conditioned" Plant West of the Rockies

*uses "FREON" refrigerants
for added safety*



Intake and cooler on the roof of administration building safely air conditioned with "Freon" refrigerants.

When this huge windowless plant, covering approximately 3 million sq. feet, was built for the Douglas Aircraft Co. in Long Beach, Calif., air conditioning was a factor of prime importance. The extremely high internal heat load from men at work, machinery, motors and lighting, plus high sun loads on the buildings, necessitated a system designed to provide suitable working conditions at all times. So York and Westinghouse units using "Freon" safe refrigerants exclusively were installed.

There are 125 units strategically located (as a wartime precaution) throughout the many buildings of the plant. They range from 50 h.p. to 62½ h.p. and produce a total of 7500 tons of refrigeration. Units are situated in the trusses directly under the roof to allow floor clearance for operation of cranes. Ductwork from fan units handling 36,000 c.f.m., is located above the bottom chord of the

trusses with air supply outlets in each bay. Return ducts are used with drops at columns and along outside walls to within 6 feet of the floor.

Today, as during the war, this plant is operating at full capacity, and with maximum air conditioning safety. Because "Freon" safe refrigerants eliminate risk of work stoppages . . . protect the health of employees and increase their efficiency.

"Freon" refrigerants are truly safe . . . non-toxic and odorless. They won't burn or explode. They are amazingly pure and moisture-free. "Freon" circulates through valves and tubes without danger of blocking or freezing the system. It helps keep maintenance costs down to a minimum and prolongs the efficient and economical life of the machinery in which it is used.

More and more prominent archi-

tects and engineers throughout the country heartily endorse equipment designed to utilize the advantages of "Freon" safe refrigerants. So when you come to your air conditioning or refrigeration problems, be sure to keep the proven safety and dependability of "Freon" well in mind. Write for technical data for your files. Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington 98, Delaware.



FREON

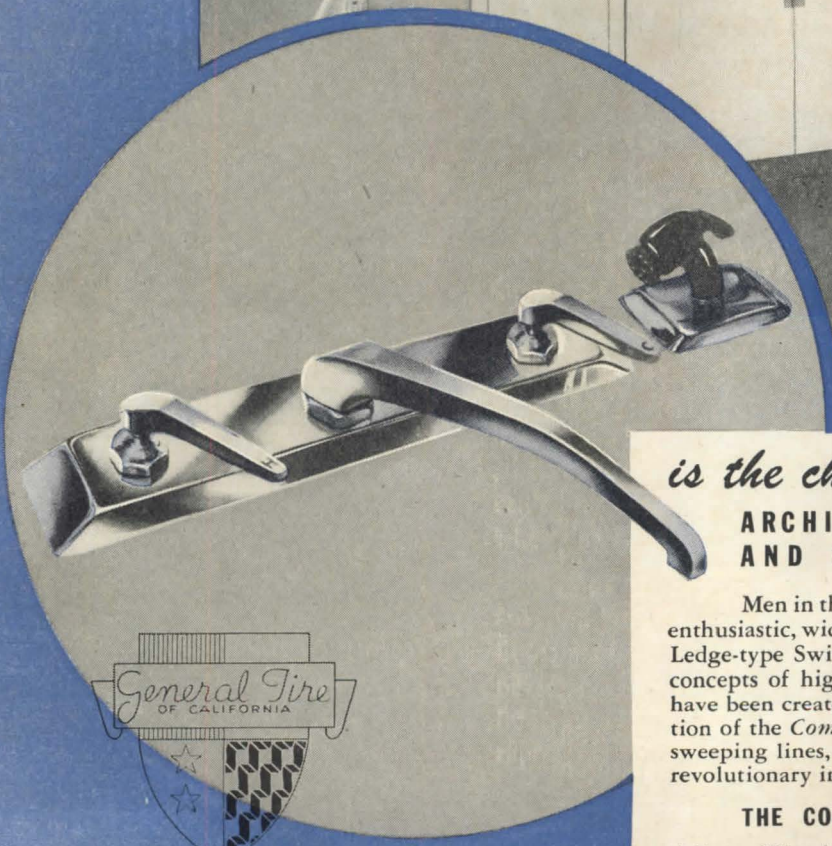
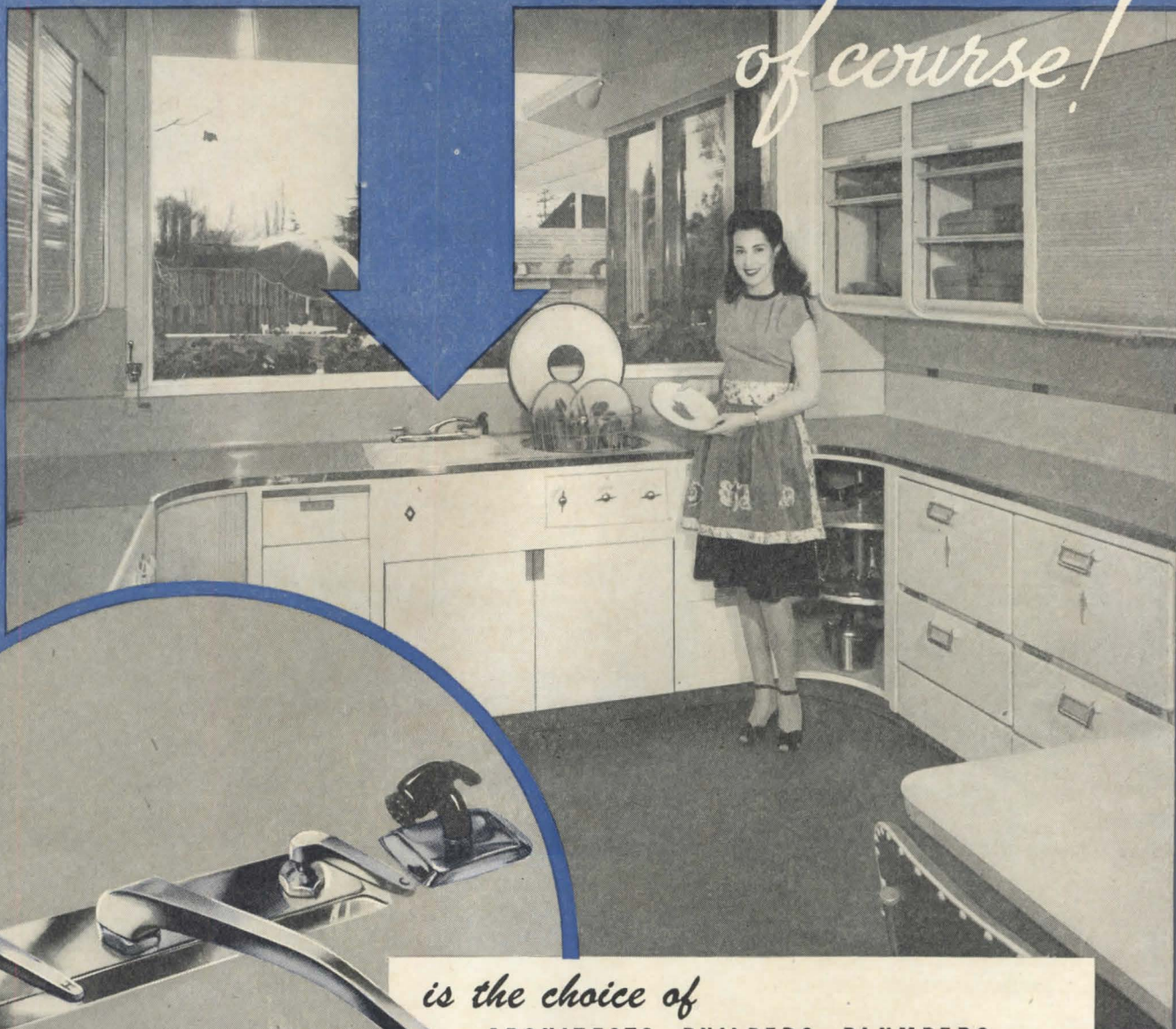
REG. U. S. PAT. OFF.

safe refrigerants

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of course!



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**ARCHITECTS, BUILDERS, PLUMBERS
AND CABINET MANUFACTURERS**

Men in the Building Industries have watched with interest the enthusiastic, widespread acceptance of GENERAL'S jewelry-polished Ledge-type Swing Spout Kitchen Faucet. In the *Commodore*, new concepts of high-strength, light weight, and maximum durability have been created through advanced brass engineering. The perfection of the *Commodore's* long-life heavy chrome finish, its graceful sweeping lines, and the strength of its light weight fabrication are revolutionary in plumbing fixtures.

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- ★ All Brass Parts — heavy triple plated, jewel-polished.
- ★ Auto-spray Attachment for rinsing.
- ★ Faucet-shanks eight inches on centers — quickly attach to wood or tile ledge.



The **COMMODORE**... choice of
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Railing, Oak Tester, Altar Bronzes, etc.
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ONE distinguishing mark of church murals, windows and altars created by Conrad Schmitt Studios is their complete harmony with the surrounding architecture. This is the outgrowth of over fifty years of close co-operation with architects in all parts of the country. Learn how pleasant it is to plan with Conrad Schmitt Studios. Your inquiries will receive prompt and courteous attention.

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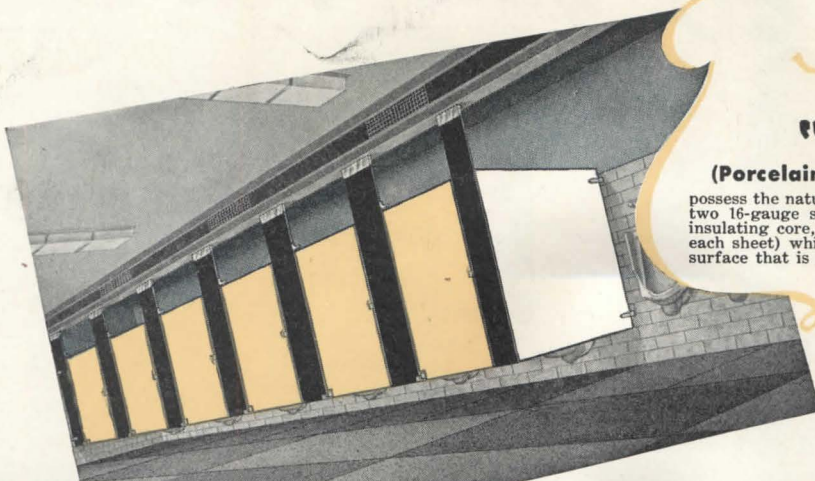
Murals - Decorations - Stained Glass - Altars

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Expediency May Invite Premature Obsolescence in a Toilet Room Environment

Sanymetal Century Type Ceiling Hung Toilet Compartments are particularly appropriate for schools. They impart dignity, refinement, and cheerfulness to the toilet room environment.

Sanymetal Porcena Academy Type Toilet Compartments satisfy architects who desire a conservative but modern toilet room environmental treatment.

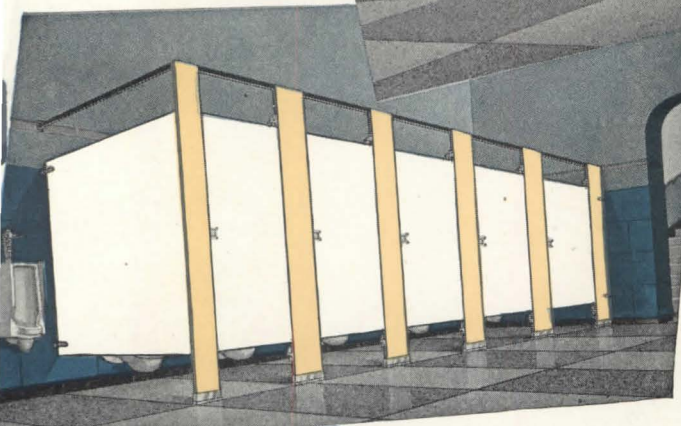


*Sanymetal**

"PORCENA"

(Porcelain on Steel) TOILET COMPARTMENTS

possess the natural structural strength of steel, not one sheet, but two 16-gauge sheets securely bonded on opposite sides of dense insulating core, strengthened by porcelain enamel (four layers on each sheet) which provides a non-porous, flint-hard, glass-smooth surface that is positively impervious to odors, acids and moisture.



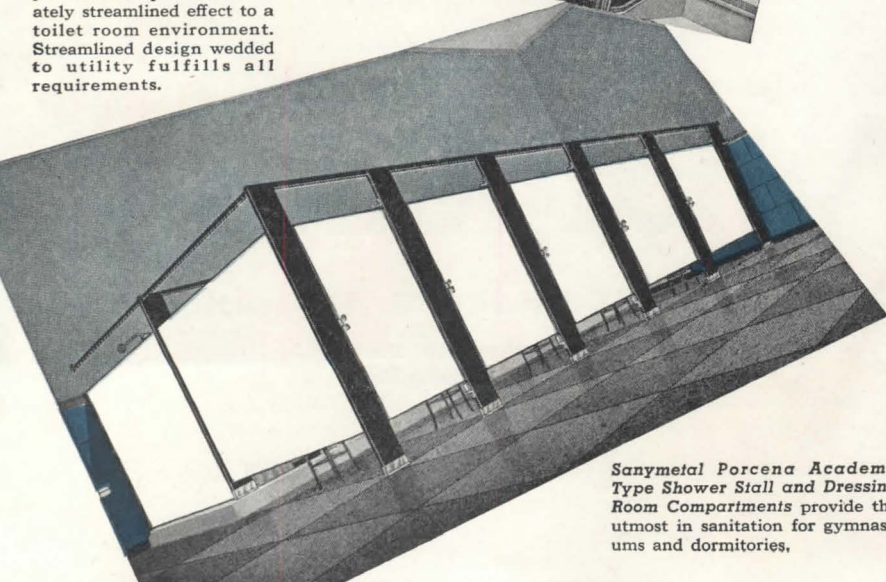
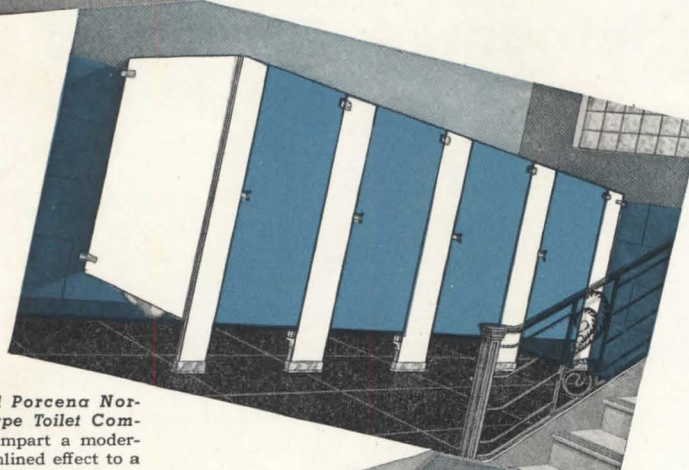
● Toilet compartments usually dominate the toilet room, influencing the environment of the one room that is important to everyone occupying the building. Toilet compartments sometimes become outmoded quickly by changes in design and materials. Sanymetal "PORCENA" (Porcelain on Steel) Toilet Compartments provide a generous measure of protection against premature obsolescence because of their modernity and beauty, fadeless color combinations, utmost sanitation, and a correct combination of the hardness of glass with the structural strength of steel, which assures years more of unvarying service.

Fabricated of the ageless, fadeless material—"PORCENA" (Porcelain on Steel)—Sanymetal "PORCENA" Toilet Compartments are available in a wide range of beautiful, never-fade colors imbedded deep into a glass-smooth, flint-hard, non-porous surface that is moisture and rust-proof, does not absorb odors, and is impervious to ordinary acids, oils and grease. The glistening porcelain finish discourages defacement; is easily cleaned, and the brilliance of the surface renewed by wiping with a damp cloth.

Ask the Sanymetal Representative in your vicinity (see "Partitions" in phone book) for helpful suggestions on planning modern toilet room environments. Refer to Sanymetal Catalog 19-B5' in Sweet's Architectural File for 1946 or write for file copy of Catalog 84.

THE SANYMETAL PRODUCTS COMPANY, INC.
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Sanymetal Porcena Normandie Type Toilet Compartments impart a moderately streamlined effect to a toilet room environment. Streamlined design wedded to utility fulfills all requirements.



Sanymetal Porcena Academy Type Shower Stall and Dressing Room Compartments provide the utmost in sanitation for gymnasiums and dormitories.

Sanymetal Catalog 84 illustrates several typical toilet room environments as well as shower stall and dressing room suggestions.

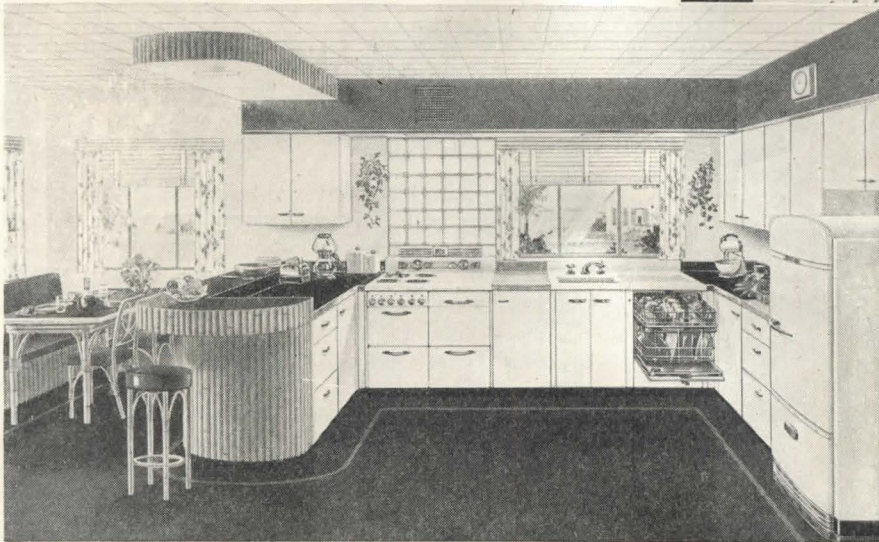


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Builders benefit from Hotpoint's leadership in the electric kitchen field!

LIVING comfort has advanced tremendously in the last 20 years . . . and nowhere with greater strides than in the kitchen. It's a far cry from the coal stove and old style sink to the streamlined Hotpoint electric kitchen of 1946. Here truly are the appliances of *tomorrow* in use *today*. From the superb new Range and Dishwasher to the smallest matching cabinet, Hotpoint kitchens make *good homes better!*

Since homes in most income brackets are

now completely equipped by the builder, your designs must make maximum use of all the improvements in equipment and materials. Hotpoint's *Portfolio of Personalized Kitchen Plans* provides complete information and planning guidance on the functional, all-electric kitchen. Attach the coupon below to your letterhead and mail to us today for your copy of this helpful *Portfolio*. Edison General Electric Appliance Co., Inc., Chicago.

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Without obligation, please send me your *Portfolio of Personalized Kitchen Plans*. This offer available in United States, Territory of Hawaii and Alaska.

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Dependability Assured by 40 Years Experience

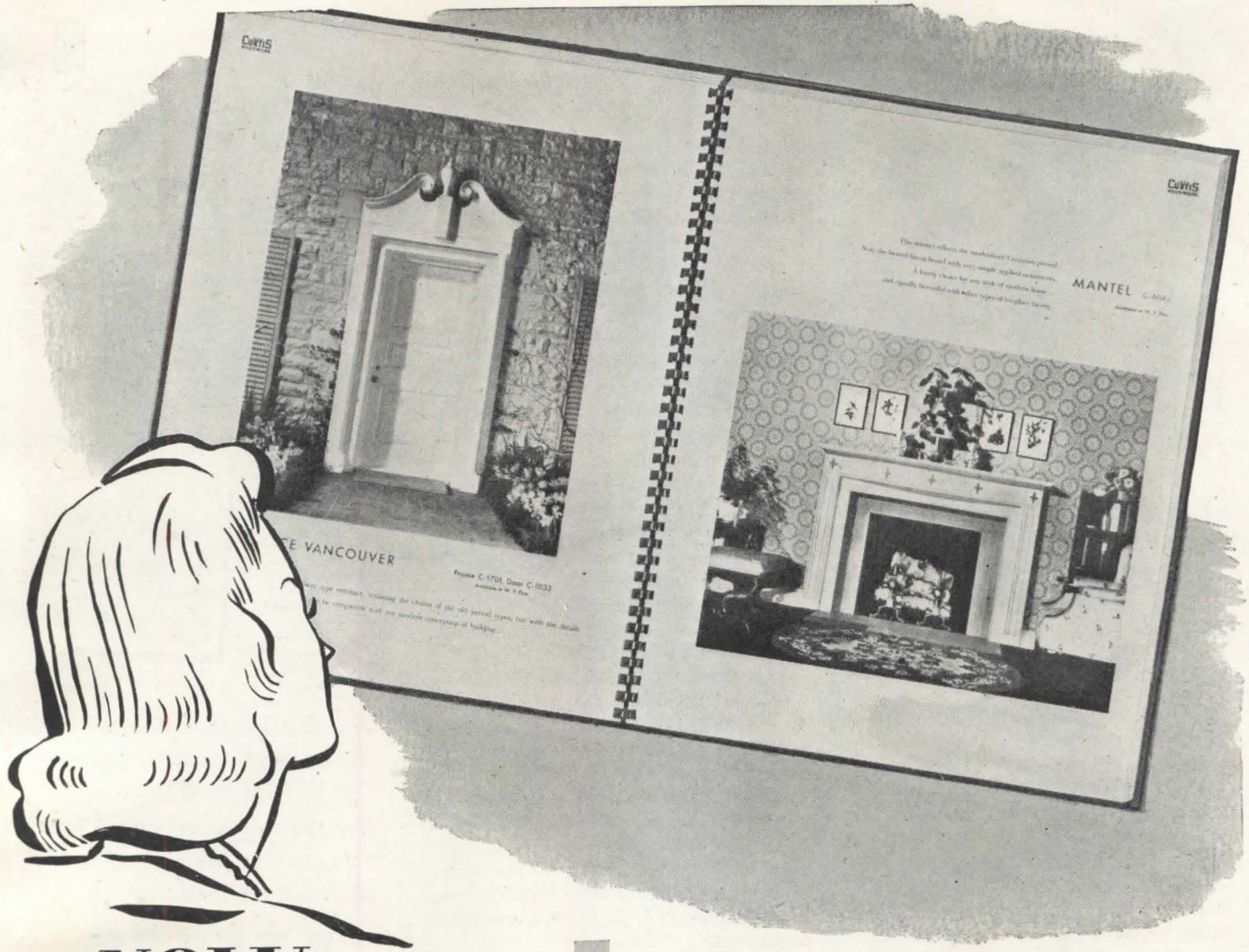
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304 Red Rock Building, Atlanta 3, Walnut 2959 • 1456 Merchandise Mart, Chicago 54, Superior 1174
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An Amazing "Showroom" of New Woodwork
... NEW CURTIS WOODWORK
STYLE BOOK!



You'll say you've never seen anything like it—once you examine this *new* Curtis Woodwork Style Book! Never before has any book presented woodwork so effectively . . . and so beautifully. For here, in big pages measuring 15 x 19 inches, are mantels—entrances, windows and doors—kitchens—china closets—stairways—and other woodwork in natural room settings and charming life-like colors.

The new Curtis Style Book contains scores of ideas for interior and exterior treatment, using Curtis Woodwork and the new Self-Fitting Silentite Windows. Outstanding decorators have contributed valuable suggestions to make this book a source of inspiration in planning and building any size home—and to make selection of woodwork easy for architect and builder as well as for the home-owner.

Have your Curtis dealer show you the big, new Curtis Woodwork Style Book which the whole building industry is talking about. And mail the coupon for literature on the new Curtis Woodwork line and the new Self-Fitting Silentite Windows.

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Gentlemen: Please send me booklets on the new Curtis Woodwork and the new Silentite Window Line.

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Architects



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Hillyard's Floor Seals, Finishes and Treatments properly protect and prolong the life of all types of floors. Floors stay cleaner, look better and last longer. Many leading flooring manufacturers and contractors approve Hillyard Products because they have given and are giving entire satisfaction in uniformity, dependability and economy. Write for literature on Hillyard products for every type surface.



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THE RECORD REPORTS

(Continued from page 146)

office. Mr. MacDonald served as a Colonel with the Western Defense Command during the war and aided in the \$139,000,000 construction program in the western states and Alaska.

David Maxwell has joined Bertell, Inc., design and development organization, 40 E. 49th St., New York 17, as director of product development and company associate.

Patrick D. Hongan, Architect, 1453 Tremont Pl., Denver 2, Colo., has announced dissolution of the firm of McCarter and Hongan.

Nashaat Morsy, A.F.S. "Eng." "Quant.," has been appointed architect to The Ghamra Bottling Company, Regal Brewery of Cairo. Address: P. O. Box 1731, Cairo, Egypt.

Mendelsohn, Dinwiddie and Hill (Eric Mendelsohn, A.I.A., John Dinwiddie, A.I.A., and Albert Henry Hill), 233 Sansome St., San Francisco 4, Calif., have announced that David B. Gideon, formerly Lt. Col. in the Corps of Engineers, U.S.A., is now associated with the office as general manager.

Guy B. Panero, engineer, has purchased the firm of Clyde R. Place, Consulting Engineers, Graybar Bldg., New York, and is now directing the organization under the name of Guy B. Panero, Successor to Clyde R. Place, Consulting Engineers.

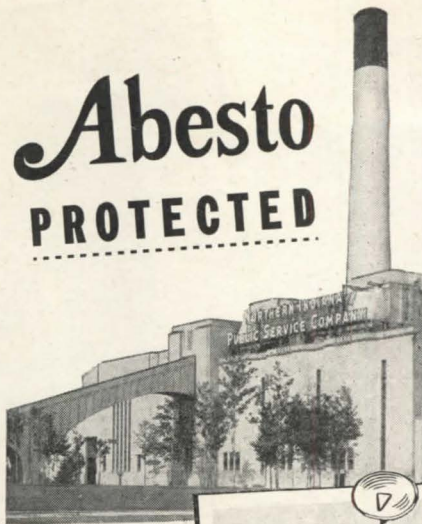
Thorne Sherwood, A.I.A., Willis Nathaniel Mills, A.I.A., and Lester Wickham Smith, A.I.A., have announced the formation of a partnership under the firm name of Sherwood, Mills & Smith, for the practice of architecture and associated fields of design, with offices at 101 Park Ave., New York City and 4 South St., Stamford, Conn.

J. Archer Turner, president of the Turner Construction Co., has announced the return to the company, as a superintendent of construction, of Col. George M. Reaves, C.E., U.S.A. Col. Reaves was with the Turner Company for nine years prior to 1931 when he joined Wark and Co. of Philadelphia.

Donald F. White, A.I.A., Architect-Engineer, has announced his association with Francis E. Griffin, R.A., and the formation of the firm of White & Griffin, Architect-Engineer Associates, with offices at 1727 St. Antoine St., Detroit 26, Mich.

Announcement has been made of the formation of the firm of Thomas Worcester, Inc., to provide complete service including engineering, architecture and construction. Offices are at 84 State St., Boston 9, Mass. Thomas Worcester is president of the new firm, William Davies is chief architect, and Henry H. Harrison is chief of construction.

Abesto PROTECTED



Generating station, Northern Indiana Public Service Co. Supplies electric power for 229 midwest communities.



Right: Workman applies protective Abesto coating.

No small maintenance job! More than 70,000 square feet of roof on this generating plant, one of many big structures protected and maintained with

ABESTO Roof Adhesives and Coating Materials

Check these features!

- ✓ Retains elastic surface when cured.
- ✓ Can be used with any standard brand roll roofing, bonding layers tightly and smoothly.
- ✓ Is highly resistant to oxidation.

Specify Abesto for new built-up construction . . . for roof maintenance

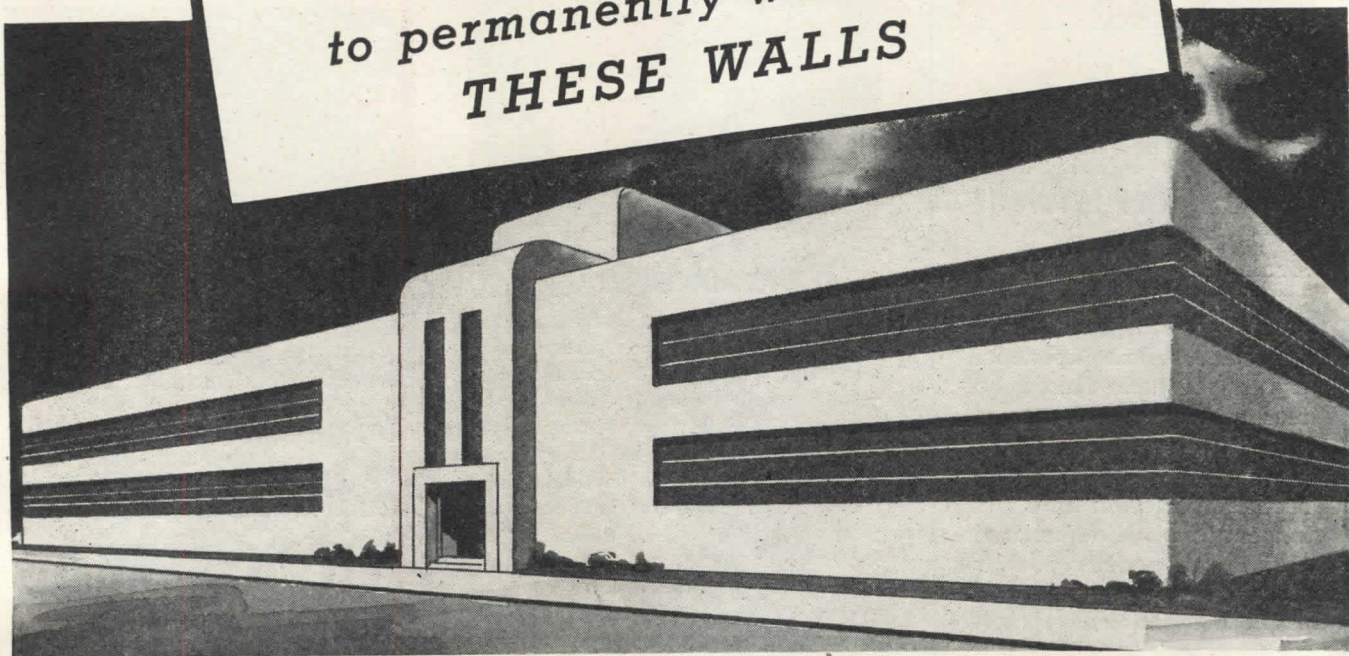


Architects . . .
Contractors

Send for A.I.A. file folder with spec sheets and descriptive literature. No obligation.

ABESTO MFG. CORP.
Dept. 8 Michigan City, Indiana

It took
ONE MINUTE
 to permanently waterproof
THESE WALLS



One minute did a permanent waterproofing job on this wall! Yes, it took only a minute for the architect to specify Medusa Waterproofed Portland Cement . . . And, that's *all the time* it took, for this cement is mixed and placed exactly the same as regular cement . . . no time wasting admixtures . . . no costly, doubtful waterproofing surface coatings . . . and no extra supervision.

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Medusa Waterproofing is ground in with the cement during manufacture—is uniformly distributed and locked in the mass . . . lines every pore of the concrete . . . repels all water—is unaffected by time, heat or cold . . . and guards against efflorescence and deterioration.

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normal concrete construction . . . and Waterproofed White when a white surface coat is desired. Waterproofed White stays white, for water carrying dirt and soot cannot penetrate to stain or disfigure the surface.

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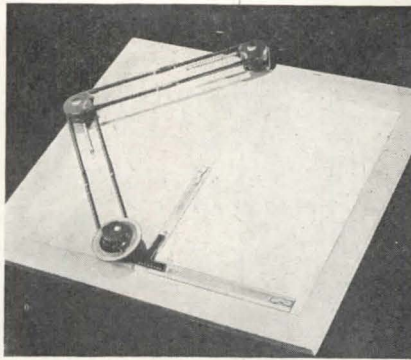
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"FIFTY FOUR YEARS OF CONCRETE PROGRESS"



MEDUSA

(Continued from page 140)



Drafting machine can be used on horizontal, sloping, or vertical drawing table

DRAFTING MACHINE

Announced as a new development in drafting machines, the *Boardmaster* is adaptable to all types of drawing tables — horizontal, sloping, or vertical — by the rapid assembly or “packaged” accessory units. Counter-balancing at any angle is designed to be frictionless and without drag. All operating controls are grouped within a 2-in. radius at the fingertips of the left hand. As a result, the drafting machine reportedly can be operated virtually by feel alone, without visual reference. The “over-arm” protractor permits full visibility of the dial throughout 360° and in any arm position. Featured are synthetic sapphire glides for use on new abrasive drawing papers without smudging or wear; increased ruggedness of arm and protractor; built-in key wrench anchor clamp and hinged anchor; replaceable snaplock, enclosed steel bands; diamond turned pulleys; and glareless aluminum matte finish. Universal Drafting Machine Co., Cleveland 14, Ohio.

FLUORESCENT EFFECTS

Fluorescent lacquers, and black-light fixtures which cause them to glow in the dark, are offered as a means of enhancing the beauty of churches. Lacquers, which come in 13 different hues, may be applied directly to walls as murals, or can be painted on wallboard for mobile sections. Black Light Products, 67 East Lake St., Chicago 1, Ill.

STANDARDS

A revised list of standards has been published by the American Standards Association. The 845 standards listed in the booklet include definitions of technical terms, specifications, dimensions, safety provisions for the use of machinery, and methods of work and test for finished products. Copies can be obtained without charge from American Standards Association, 70 E. 45th St., New York 17, N. Y.



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is ALWAYS a
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Bankers concerned with real estate invariably recommend cast iron for new boilers or for replacement. Experience has taught them these good reasons why cast iron is a sound investment . . .

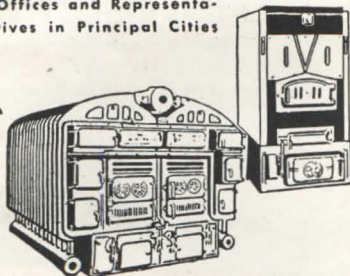
Cast-iron boilers resist rust and corrosion, thus last longer and may be amortized over longer periods . . . their sectional construction means easier installation or replacement . . . their high efficiency results in consistently-low operating costs . . . they are readily adapted to all fuels.

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Anchor Weld Fences and Gates . . . made in many handsome designs . . . provide a beautiful setting for homes, country estates, schools and institutions. And, when you specify them, you can be sure they'll maintain their fine appearance through the years.

For . . . in Anchor-Weld Iron Fence . . . grooved, square pickets and rails of the same size are worked into architecturally correct designs . . . then electrically welded under pressure in an exclusive Anchor process. Pickets cannot loosen. Sections cannot sag. There is no need for ugly cross-bracing.

Anchor also makes a complete line of Anchor Chain Link Fence, in heights from 3½ feet to 10 feet. Tough and durable, it has deep-driven “Anchors” which hold the fence erect and in line, in any soil and in any weather.

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No. 111 for Anchor-Weld Iron Fence. No. 110 for Anchor Chain Link Fence. Show installation photographs and sectional drawings . . . describe the various heights, weights, architectural features and applications of Anchor fences and gates. Anchor Fence Div., Anchor Post Products, Inc., 6600 Eastern Ave., Baltimore 24, Md.

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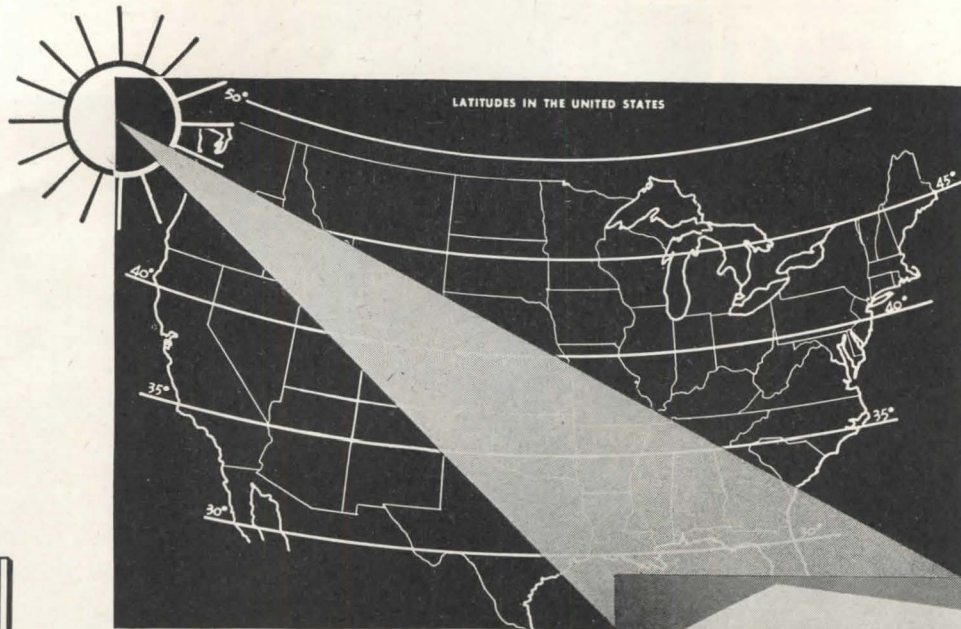
IT'S A SAFE NAME

HERRING-HALL-MARVIN SAFE COMPANY

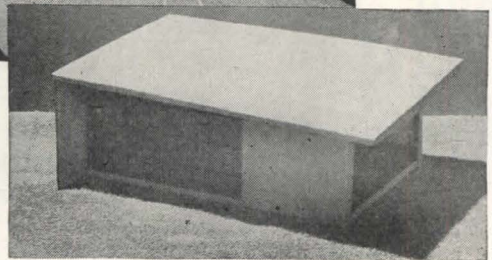
General Office and Factory . . . Hamilton, Ohio

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USING THE SUN



TO CUT LIGHT AND FUEL BILLS



It sounds easy — but the easy-looking results achieved by experienced architects involve some very complicated mathematics.

The "solar house" is not just a flat-roofed house with a wide overhanging eave on one side. It is a house in which lighting and heating are tied by architectural design to the position and movement of the sun. No matter what the house looks like — unless the orientation, roof pitch and amount of roof overhang are calculated on the basis of solar angles — it cannot be a solar house.

At Winnipeg, Canada, the highest point reached by the sun — on December 22 — is 16° 30 minutes; at Miami, Florida, it's 41° 30 minutes. Every day of the year at every latitude the sun rises at a different point on the horizon. On June 22 — at Key West — the position of the sun above the horizon (its

"azimuth") undergoes a change of 174° between 11 A. M. and 1 P. M. . . . So — how shall your house be faced and built, to put the sun to work for you?

One of the feature articles in a recent issue of Architectural Record provides a set of charts whereby the architect can determine the exact sunlight and shadow — all year 'round — for any part of the United States.



Architectural Record is the work book of a great many architects and associated engineers. Every check shows that at least 80% of all current planning of investment building is on the boards of Record subscribers. In these offices you find the Record out in the work rooms, in use, rather than on the reception tables.

The reason is simple . . . Through

exclusive circulation methods — based on Dodge Reports gathered by 750 field men — paid circulation is solicited from those who have jobs on their boards (if they are not already subscribers). From this same information background, the editorial content is accurately guided to parallel the range of subjects on which the greatest number of subscribers are currently interested.

The advertiser in Architectural Record knows that he is reaching a homogeneous audience, currently in the market for building products and services. He knows that his advertisement is of equal interest to all its readers. Here is the market place in which to keep your story told.

We have prepared a check list — "Pointers on Writing Architectural Copy" — which enlarges on the three yardsticks of Appearance, Utility and Investment Value. Your copy will be mailed on request.

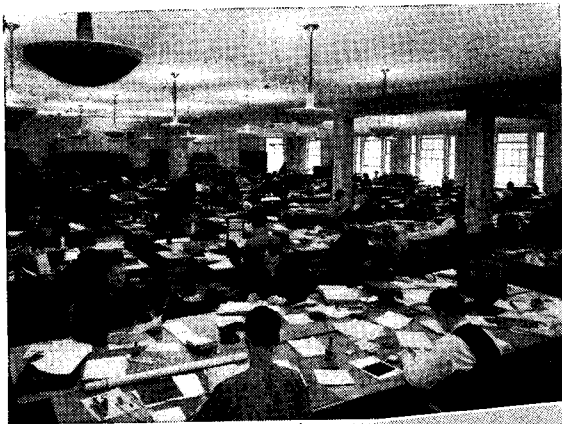
ARCHITECTURAL RECORD

119 WEST 40TH STREET, NEW YORK 18

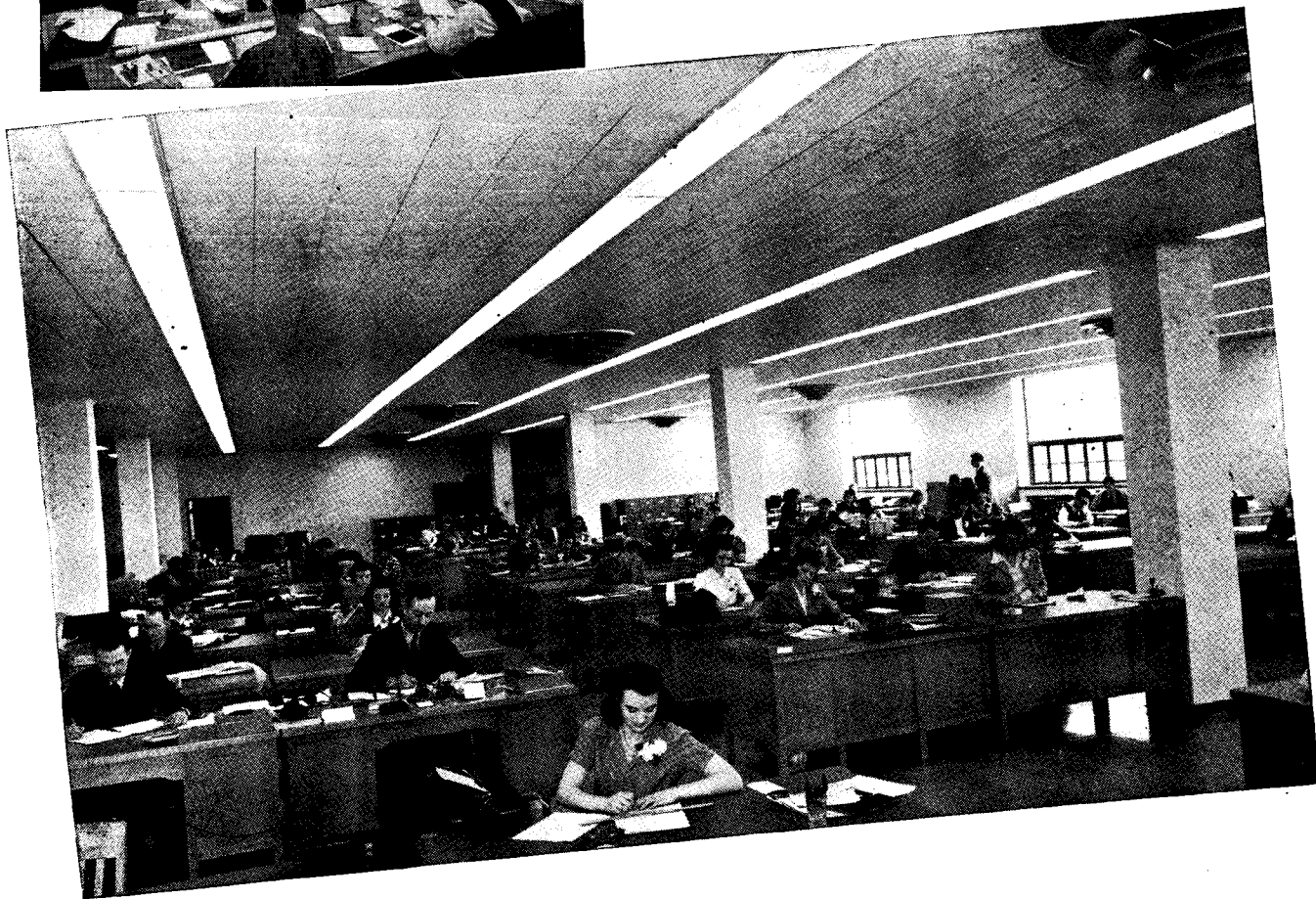
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BIG IMPROVEMENTS
can you see here?**



WHETHER you're modernizing your old office or building a new one, three important considerations always pop up. They are modern lighting, air conditioning (if the budget permits), and the type of acoustical material that will provide ample noise reduction. This last is where we come in.

In selecting the right acoustical material, your local factory-appointed Gold Bond Acoustical Applicator can be of tremendous help. He is an experienced engineer—familiar with the newest types of materials, the sound absorption coefficients and the

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Whatever your preference, a tile design or a monolithic treatment, there's a Gold Bond acoustical product to meet the requirements. The full line is described in Sweet's along with over 150 other Gold Bond better building materials. Consult the phone directory under "Acoustical Materials" for the official Gold Bond Applicator in your area or write us at Buffalo for his name.

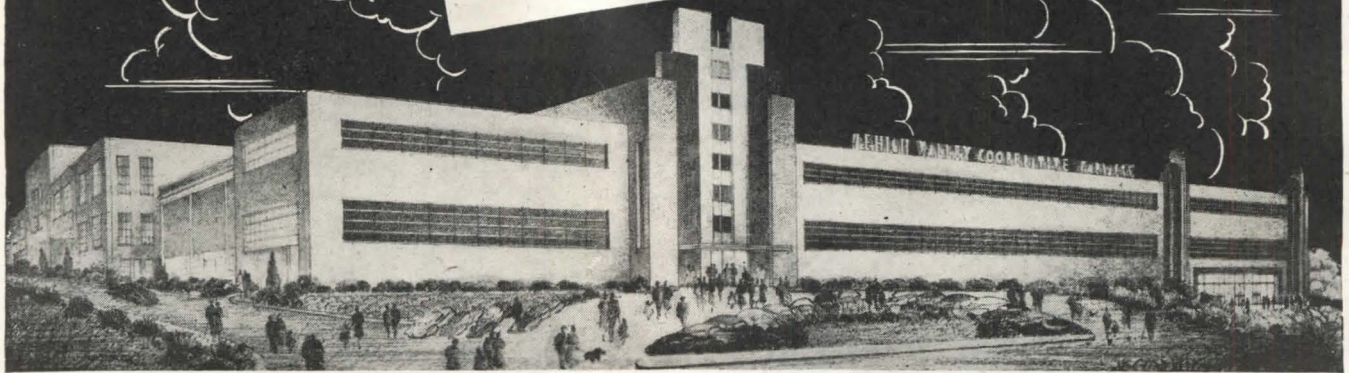
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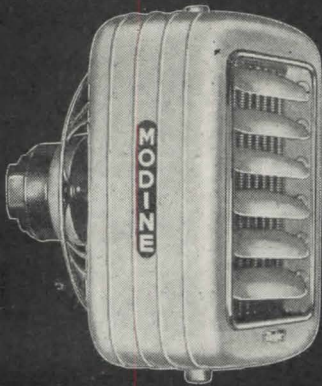


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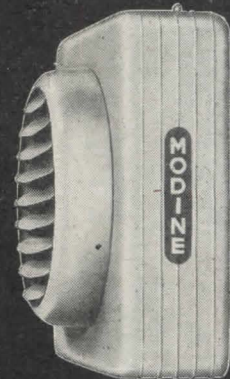
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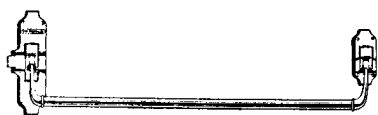
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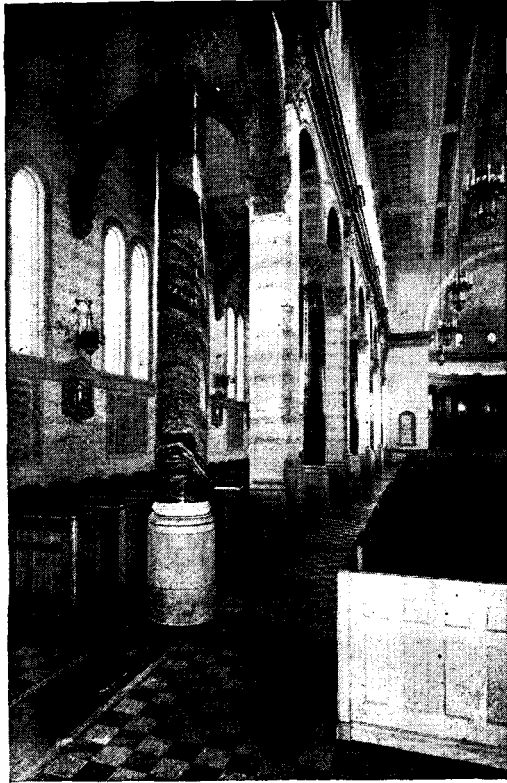
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See Sweets' Index, Sec. 17B/2

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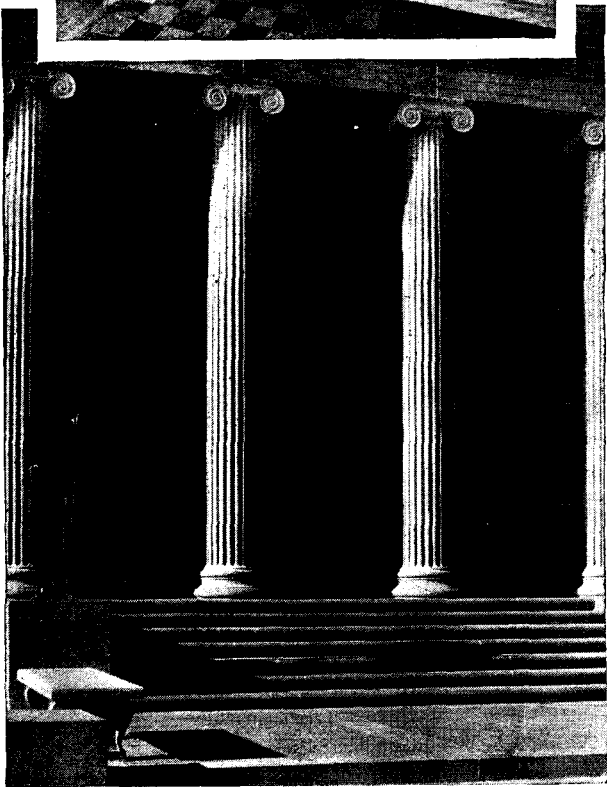
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Architects tell us granite entrances in their buildings help to establish a desired character and individuality.



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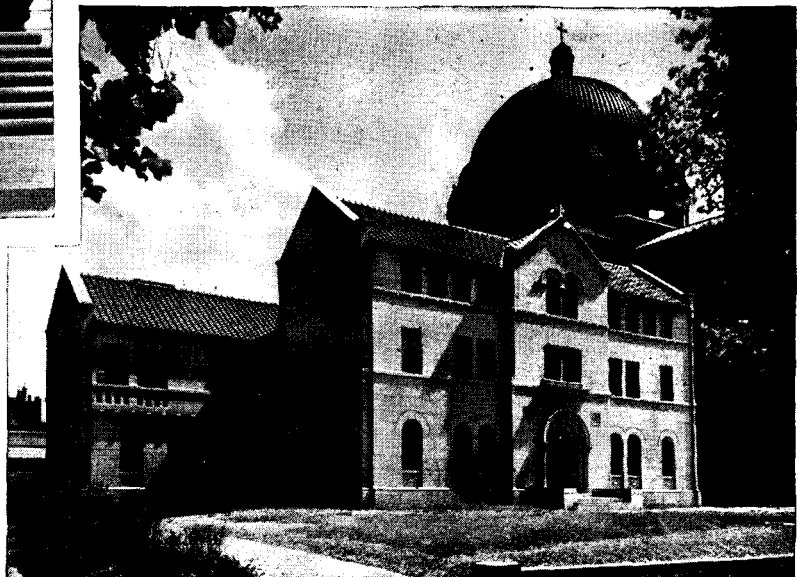
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For typical specifications and color reproductions see Sweet's $\frac{4A.}{3}$

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ARKETEX FOR *Budget Beauty*

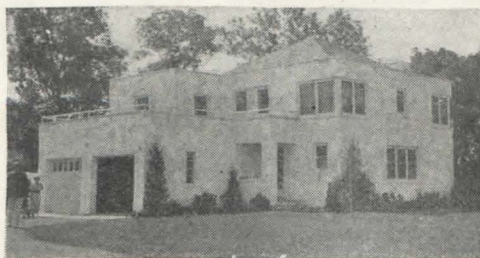
Yes, there's four way comfort in the modern home of Arketex ceramic glazed structural tile. The entire family will delight in the comfort afforded by a home that is always cool in summer; the winter comfort of a home easy to heat; for the man of the house is the comforting realization that with Arketex tile, *the first cost is the only cost!* Mrs. Housewife will enjoy the comfort of beautiful walls of everlasting color, which require no more than soap and water washing to retain their luster.

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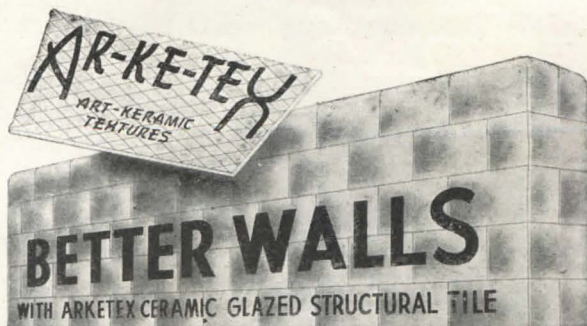
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in these *Balsam-Wool* data sheets!



• Reconversion shortages emphasize the need for building additions to existing structures in order to provide more living space. The two Balsam-Wool data sheets pictured here deal with the important matter of insulating and ventilating such additions. These sheets are part of a series—comprising more than 30—containing hard-to-get information on insulation application. The entire series is yours for the asking—without obligation—just mail the coupon!

Balsam-Wool APPLICATION DATA SHEET SEC. B No. 5

INSULATING AND VENTILATING AN ADDITION WITH A FLAT ROOF

2" x 4" FLAT 16" O.C.
LOOKOUT
NU-WOOD TILE
DOUBLE-THICK BALSAM-WOOL

CORNICE DETAIL
SCALE 1/8" = 1"

WHEN a room addition has a flat roof, the need for ventilation between the insulation and the roof is probably more important than in pitched roof construction. Adequate ventilation of flat roof construction is especially desirable during summer months to flush out the hot air which normally accumulates under the roof. During the winter months, ventilation will minimize the possibility of condensation on the underside of the roof construction.

Balsam-Wool APPLICATION DATA SHEET SEC. B No. 4

INSULATING AND VENTILATING AN ADDITION WITH PITCHED ROOF

LOUVER
VENTILATION
DOUBLE-THICK BALSAM-WOOL
STANDARD BALSAM-WOOL
SCREENED OPENING EACH SIDE FOR VENTILATION

WALL SECTION
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To assure superior performance Balsam-Wool insulation should be carefully applied with the edges and ends of the blanket sealed to ventilate the members. It is also important to ventilate the attic space and the unexcavated space under the floor. The free open area of the screened gable wall louver should have a ratio of approximately 1/4 square inch for each square foot of attic floor area. The area of the screened openings under each eave should equal the open area of the wall louver.

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Please send me set of Balsam-Wool Application Data Sheets.

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CITY STATE

DIAGRAM OF A-289-012 OPERAY MULTIBEAM (12 BEAM)

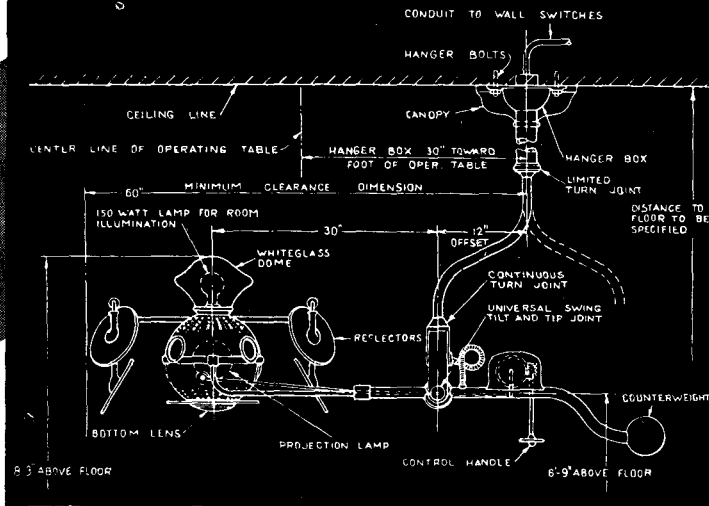
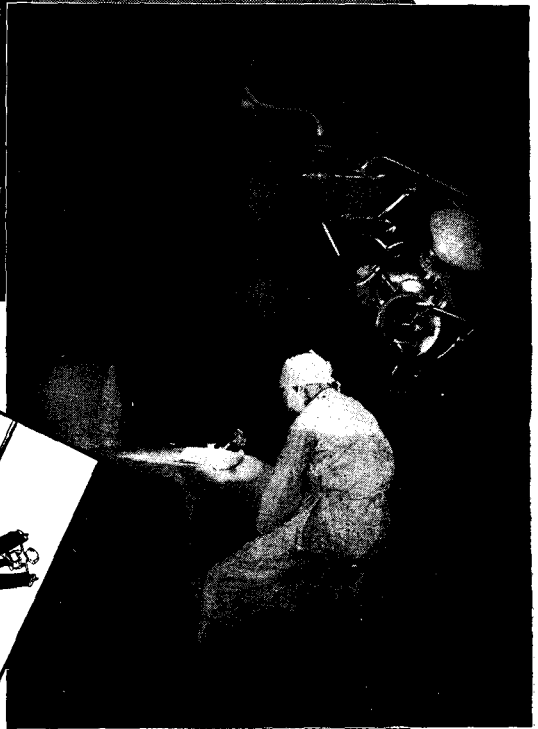
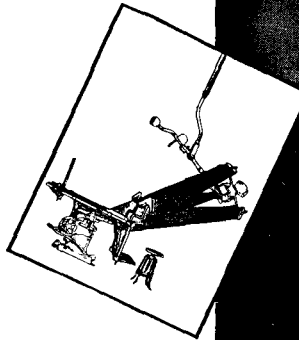


Diagram showing general dimensions and clearances required for rotation of Operay Multibeam.

Authentic Aid in PLANNING FOR SURGICAL LIGHTING



● Provision for adequate lighting for today's surgical techniques is an important factor in the planning of the modern hospital.

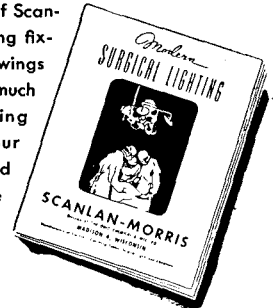
The wide-spread specification of Scanlan-Morris Operay Multibeam lighting fixtures is due to their exceptional efficiency—extensive flexibility of adjustment to permit angled, lateral, or direct vertical projection, and the capacity to deliver soft, white, glareless illumination into the depths of the surgical cavity.

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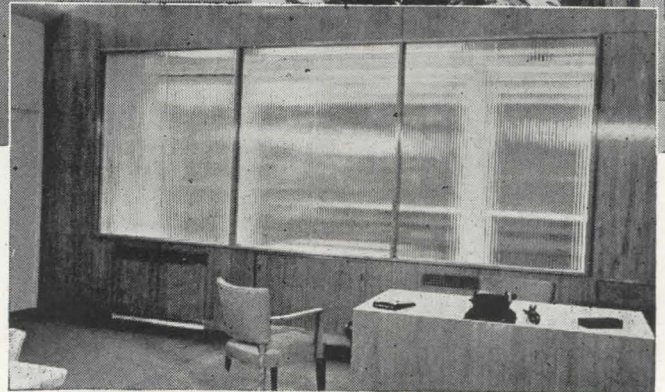


Architect: Henry B. Harrison



Above: Wall of clear Louvrex lets in abundant daylight and adds distinction to the modern design of Structon's offices in Los Angeles.

Right: To conceal an undesirable view of a court, and to create a sparkling background, clear Flutex was chosen for the windows in Bernhard Uhlman offices.



Designer: S. S. Silver & Co., Inc.

As a material, Decorative Glass is unique. Its design potential is enormous. Alone or in combination, it offers the architect or designer the versatility found in no other medium. Decorative Glass combines the cleanliness and sparkle of glass with distinctive beauty. It is durable, weather-resisting, utilitarian. It creates an effect of luxury even when used for purely functional purposes.

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"Design it with one of the 5 EX's"

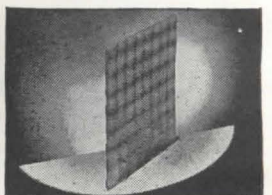
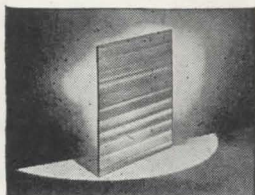
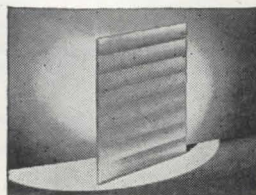
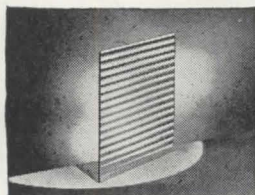
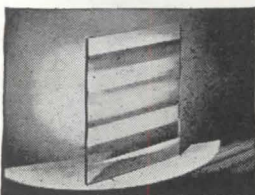
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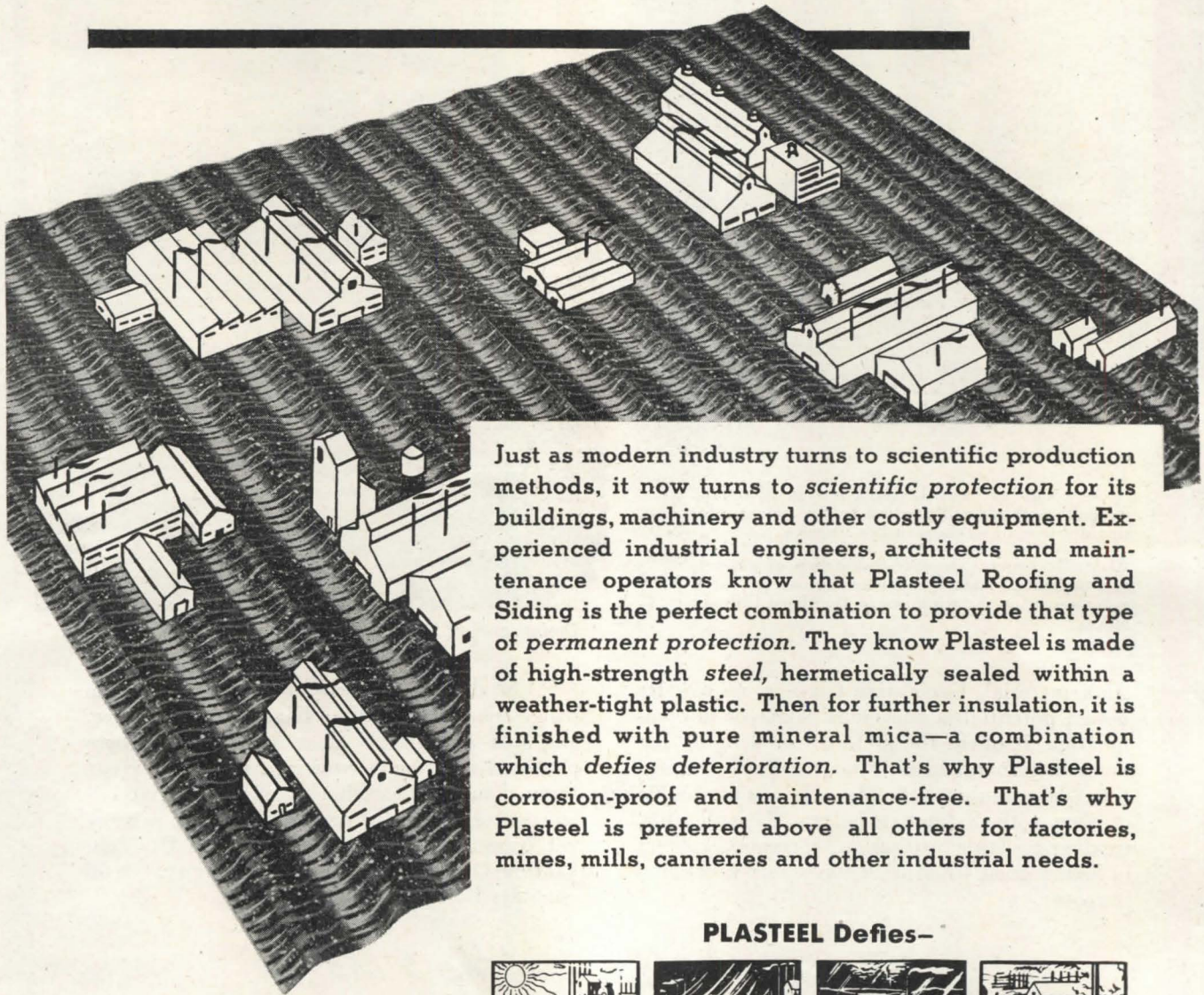
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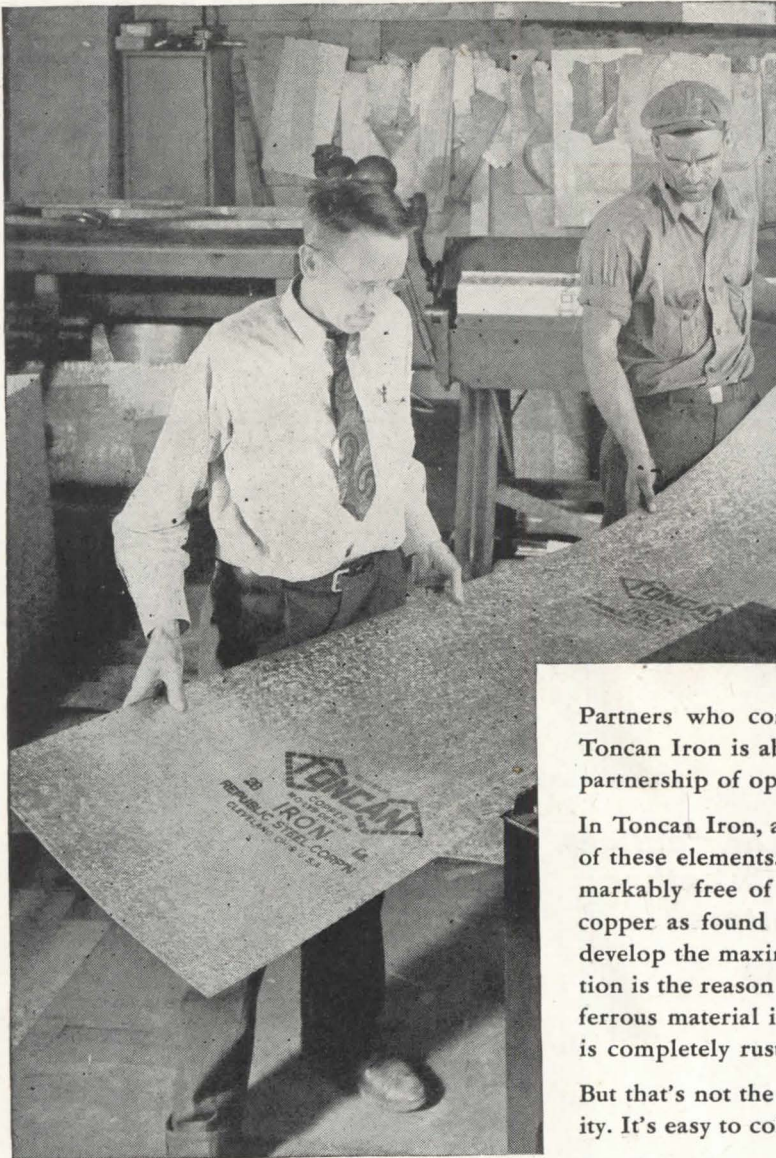


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In Toncan Iron, advantage is taken of the qualities offered by each of these elements. To highly refined open-hearth iron, which is remarkably free of rust-inviting impurities, is added twice as much copper as found in copper-bearing steel. Molybdenum is used to develop the maximum rust-resistance of the copper. That combination is the reason Toncan Iron has the highest rust-resistance of any ferrous material in its price class. And it's the reason Toncan Iron is completely rust-resistant throughout its entire cross-section.

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—for ducts, gutters, conductor pipes, roofing, siding, tanks, ventilators, skylights, hoods, and other sheet metal applications requiring rust-resistance—
 and for corrugated metal drainage products.

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When we put an actual Adlake Window to a rigid test, it passed its one millionth opening with flying colors!

What did the test prove? Simply this:

After 1,000,000 cycles of opening and closing, the exclusive nonmetallic weather stripping used by Adlake showed little or no signs of wear!

What's more, the increase in air infiltration was practically nil, and the window moved as freely and easily as it did at the very beginning of the test!

NO WARP, ROT, SWELL, STICK OR RATTLE

An Adlake Window gives a lifetime of efficient service because it's precision-built right down to the last detail. No painting—no maintenance of the lustrous aluminum to worry about. Patented serrated guides give finger-tip control . . . no warp, rot, swell, stick or rattle—*ever*. And Adlake is designed to blend harmoniously with

either modern or traditional structures.

Why not drop us a card today for complete data?

THE FOLLOWING TABULATION SHOWS THE RESULTS OF THE TEST, AS CONDUCTED BY AN INDEPENDENT RESEARCH FIRM:

Number of cycles of opening and closing upper and lower sash	Air infiltration—cubic feet per minute per foot of inside crack perimeter at a pressure equivalent to an air velocity of 25 miles per hour
0	0.237
100,000	0.315
200,000	0.320
300,000	0.332
416,200	0.427
507,800	0.481
750,000	0.557
1,000,000	0.579

THE ADAMS & WESTLAKE COMPANY

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NEW YORK • CHICAGO

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SOLVE YOUR PROBLEM OF
PROTECTION...

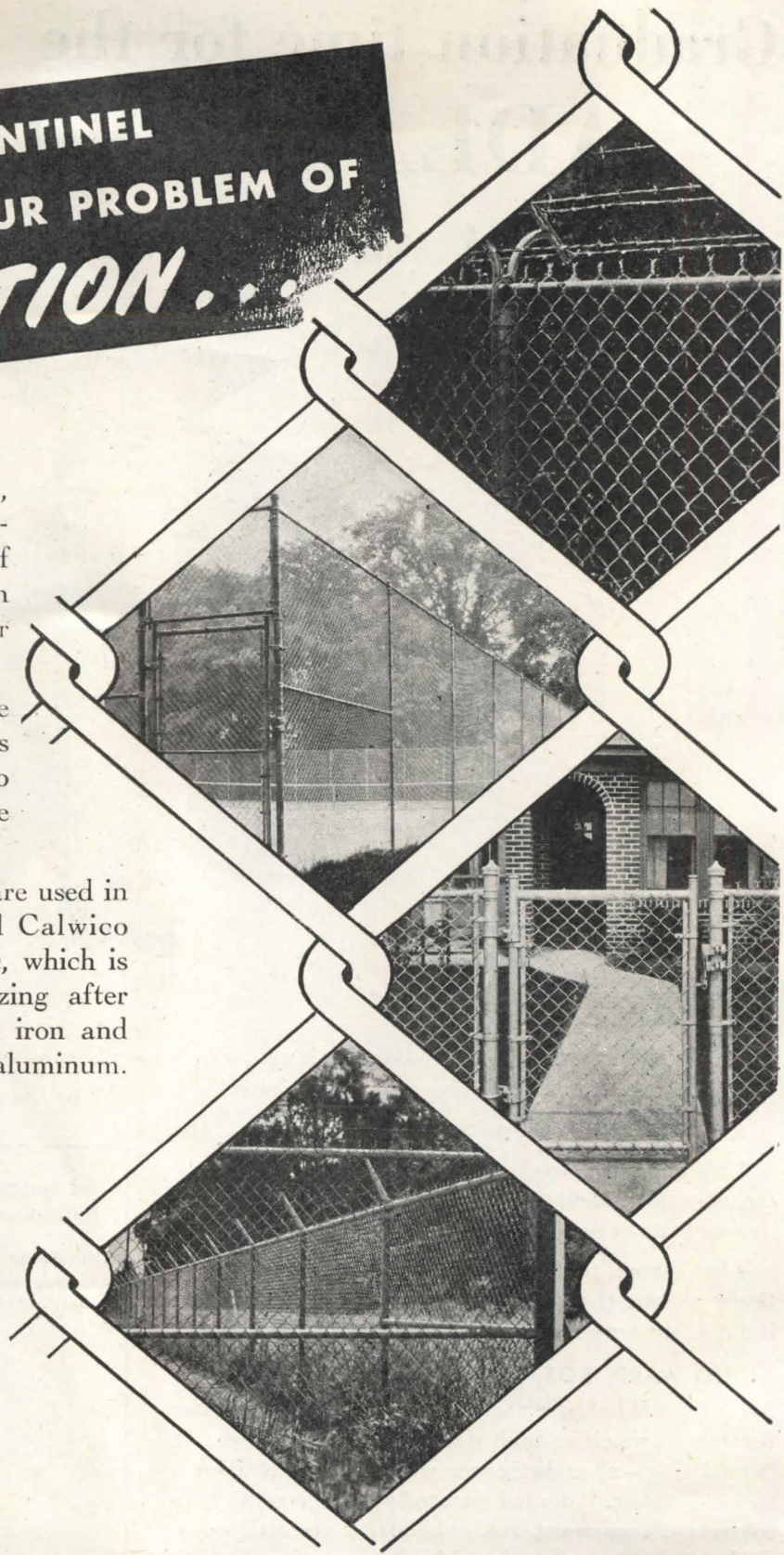
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A sturdy chain link fence solves the problem of property protection for its initial cost is moderate—it's easy to install—and maintenance costs are amazingly low.

Only the best selected materials are used in making Wickwire, Colorado and Calwico Brands of Chain Link Fence fabric, which is further protected by hot galvanizing after weaving. Fittings are of malleable iron and pressed steel, heavily galvanized, or aluminum.

FREE ESTIMATES

We will be happy to measure your property, work out details to secure proper protection, and submit estimates for fence material ready for erection or covering complete installation by our trained crews. For free catalog and further particulars, write to our nearest branch office.



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DIVISIONS OF THE COLORADO FUEL AND IRON CORPORATION

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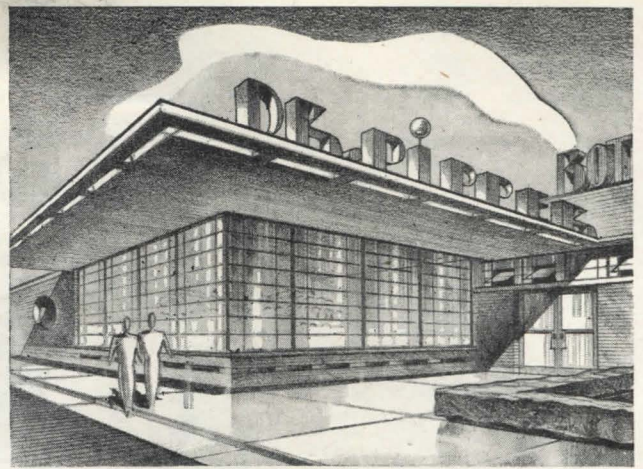


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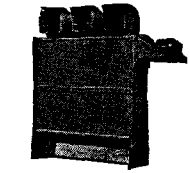
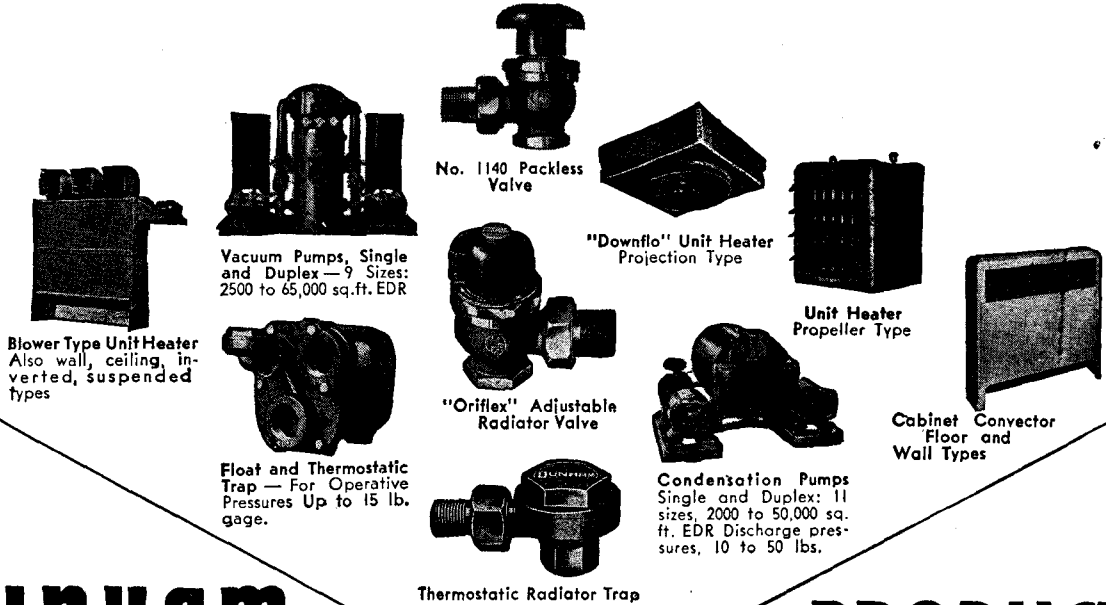
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Vacuum Pumps, Single and Duplex—9 Sizes: 2500 to 65,000 sq.ft. EDR



No. 1140 Packless Valve



"Downflo" Unit Heater
Projection Type



Unit Heater
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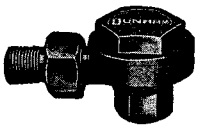
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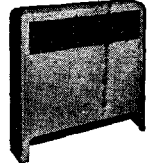
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Cabinet Convector
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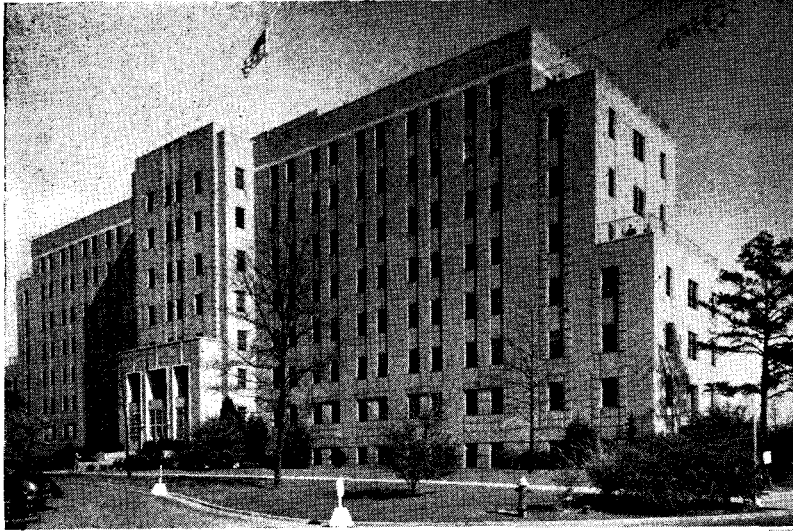
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Walter W. Hook, Architect

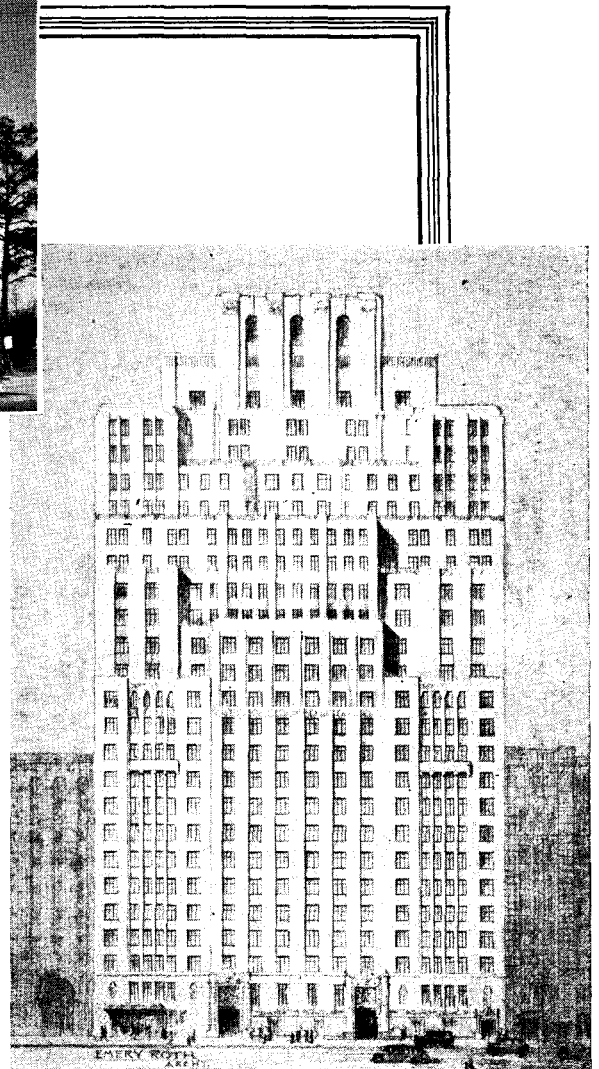
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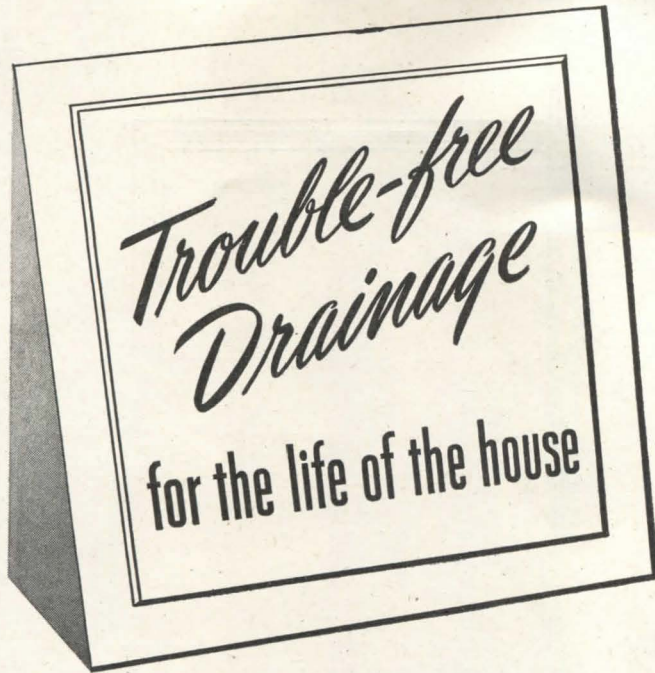
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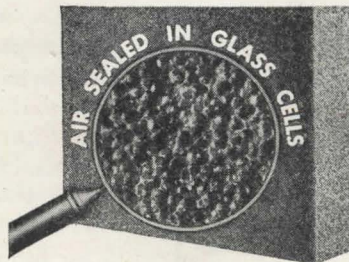
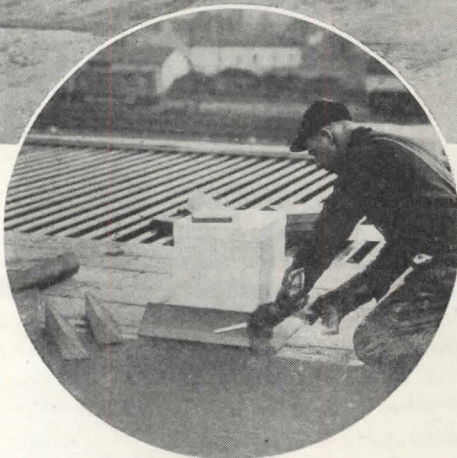
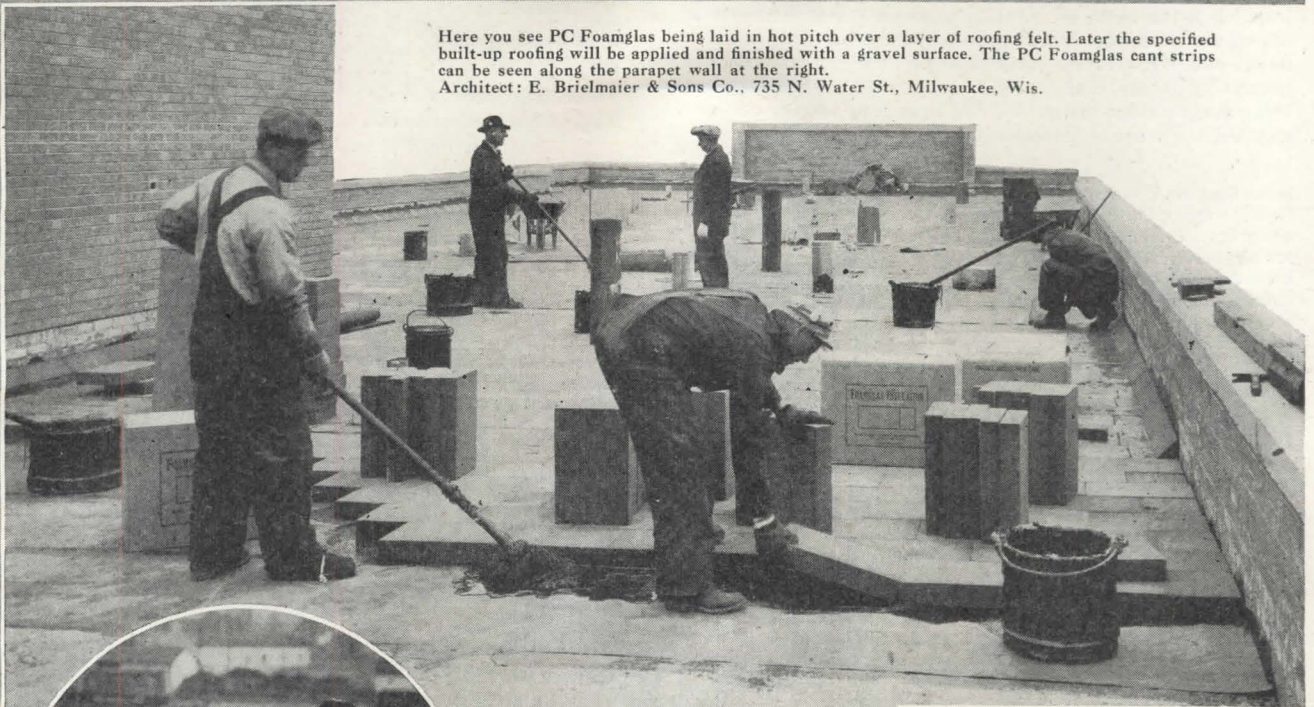
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Architect: E. Brielmaier & Sons Co., 735 N. Water St., Milwaukee, Wis.



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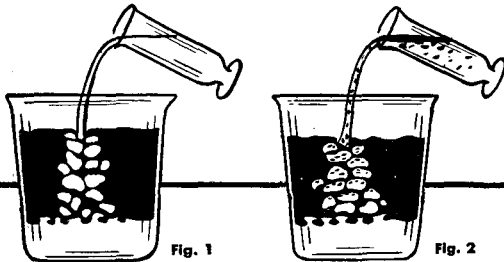
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How should a Grease Trap work -

BY **GUESS** . . .

OR BY **GREASE?**



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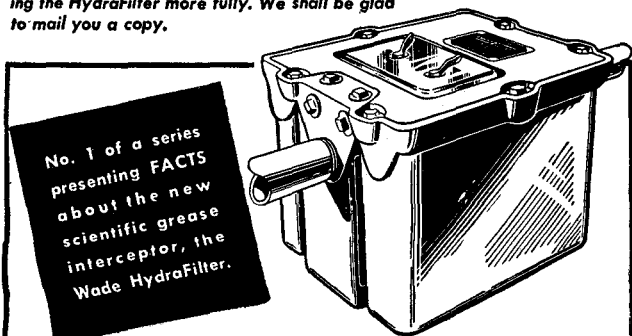
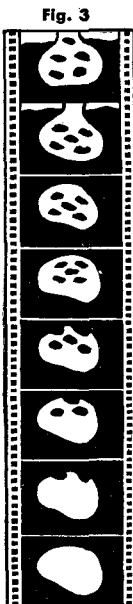
Let us illustrate it to you briefly.

Figure 1 represents hot water falling into molten grease. Everyone knows that the two will not mix. Instead, the water is slowed down and broken up into many tiny drops spread out through the grease. This means that a vastly increased water surface area is brought into contact with the surrounding grease.

Figure 2 goes a step further to show a mixture of water and grease, resembling the waste from kitchen sinks, pouring into a layer of grease similar to that in the HydraFilter. How this layer "wipes" or filters almost all the grease from the incoming mixture is shown in detail in Figure 3.

Here a magnified single drop travels downward through the grease filter. As it does so, the tiny grease drops, being lighter, rise to the surface of the water drop. There they are "wiped off" and absorbed by the adjacent grease. The last picture shows all grease extracted from the water, as it is in all the thousands of other drops into which incoming wastes are broken up in the HydraFilter.

We have just prepared an illustrated booklet "A New Principle in Grease Interception," describing the HydraFilter more fully. We shall be glad to mail you a copy.



No. 1 of a series presenting **FACTS** about the new scientific grease interceptor, the Wade HydraFilter.

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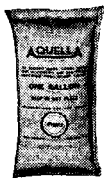
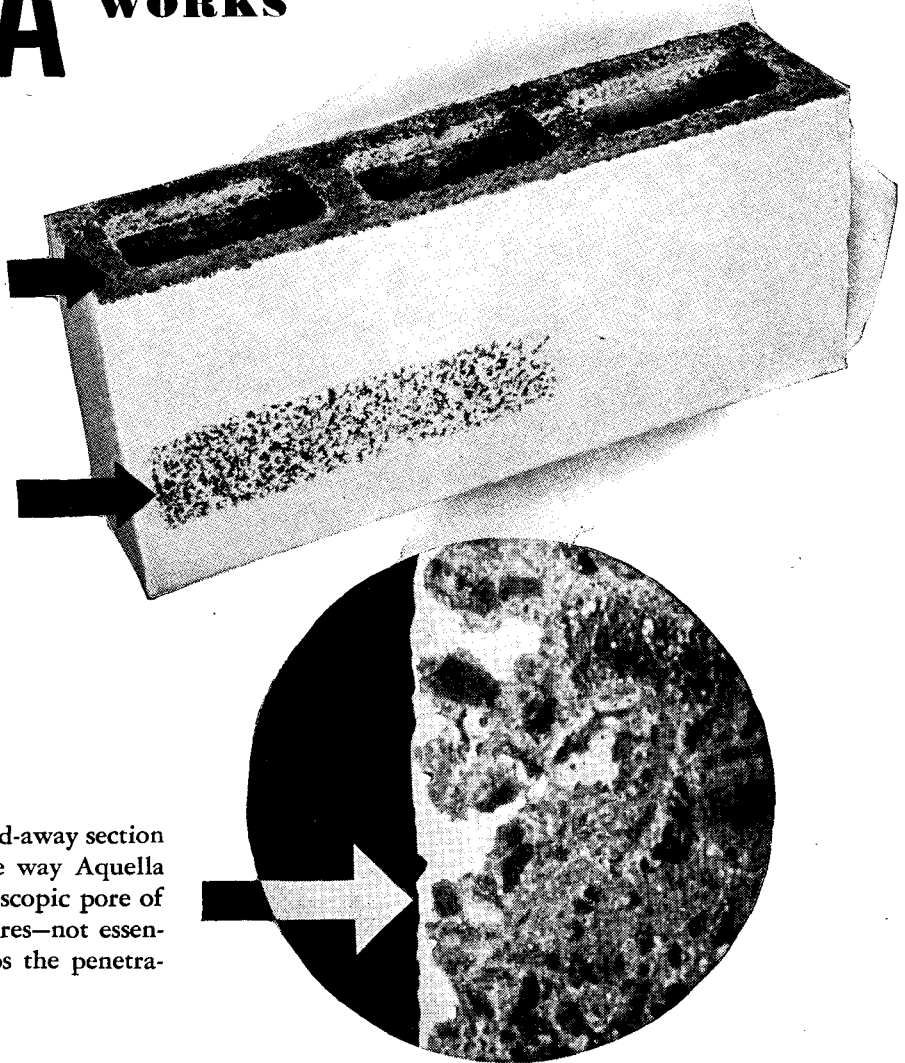
THE PRINCIPLE ON WHICH

AQUELLA WORKS

1 Here is an Aquellized concrete masonry unit filled with water. Naturally, there is no leakage.

2 But what happens if the Aquella surface coating is scraped off? To answer that, we scraped away this portion, and there's still no leakage. This may be slightly puzzling until you study the photograph of the third step...

3 The enlargement of a small, sawed-away section of the above block, which shows the way Aquella penetrates to fill and close each microscopic pore of the surface. It is the filling of the pores—not essentially the surface coating—which stops the penetration of water.



YOU SEE IT NOW—the principle on which Aquella works to make concrete masonry structures watertight!

The properly balanced ingredients of which Aquella is composed are so *finely ground* that when mixed with water, and scrubbed into the masonry, they penetrate and fill even

the minutest pores of the surface.

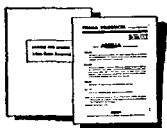
Then—contrary to the shrinkage phenomena of most waterproofing materials—Aquella continues to *expand* as it cures to set up a hard, firm bond which stops water leakage, dampness or seepage.

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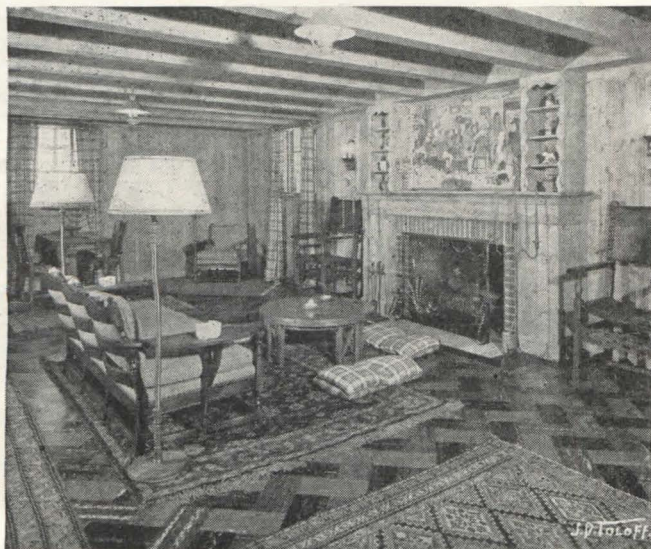
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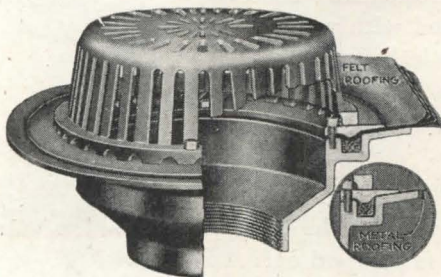


Roof Drainage Problem?

Boosey

No. 1148

ALL PURPOSE DRAIN



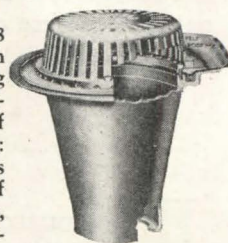
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1148-B With Increaser

With Increasers Area of roof in horizontal projection (sq. ft.)	Without Increasers Area of roof in horizontal projection (sq. ft.)	Diameter of Downspout (inches)	Diameter of Increaser (inches)
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3,800	1,300	4"	6"
7,750	2,400	5"	8"
11,500	3,800	6"	9 1/2"

Send us your roof drainage problems.
We are sure we can be of help to you.

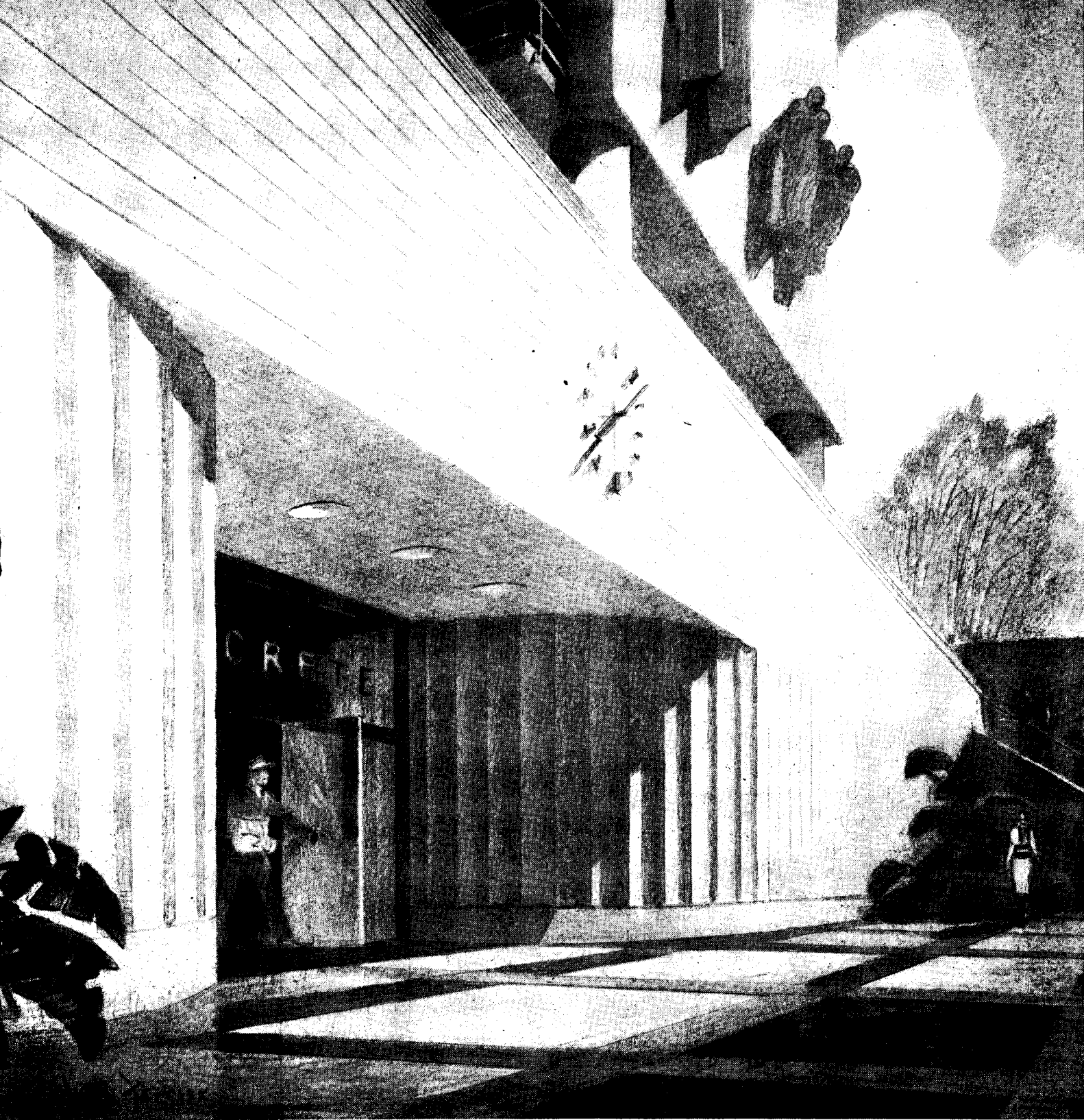
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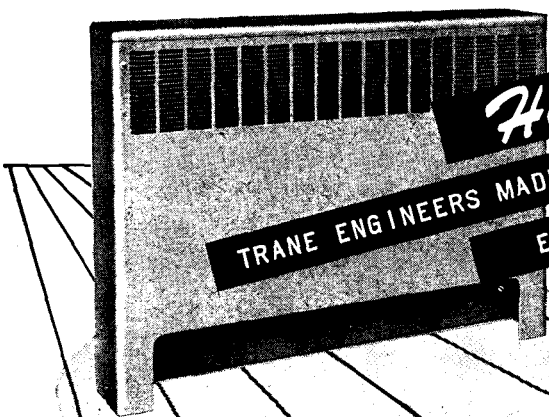
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NOW... CUSTOM-TYPE HEATING BOUGHT OVER THE COUNTER

Convectors had to be ordered specially for each job until Trane engineers decided to do something about it. There were dozens of cabinet models, and scores of heights, widths, and lengths. Each type of heating system required a different heating element.

To make the convector easy to buy, Trane engineers first designed a single cabinet that could be installed either free standing or recessed. They found that a smaller number of heights, widths, and depths would satisfy nearly every requirement. Then they designed a universal element that would work equally well with every type of hot water or modern steam system. Finally they devised a system of mass production.

Now Trane can build its standardized Type A Convector-radiator as fast as materials can be ob-

tained. Distributors can easily stock the light-weight packaged units, so that contractors can readily buy them over the counter.

The process of making a Convector-radiator easy to buy is another example of the ingenuity of Trane Engineers, who carry out a constant program of research in the development and refinement of Trane Products and Systems.

All Trane Products are designed and built together for service together. The architect and engineer will find that there is a complete Trane System for almost every conceivable application in heating, cooling, and air conditioning.

More than 200 Trane field engineers in principal cities all over the country cooperate with architects, engineers, and contractors in the application of Trane Weather Magic.

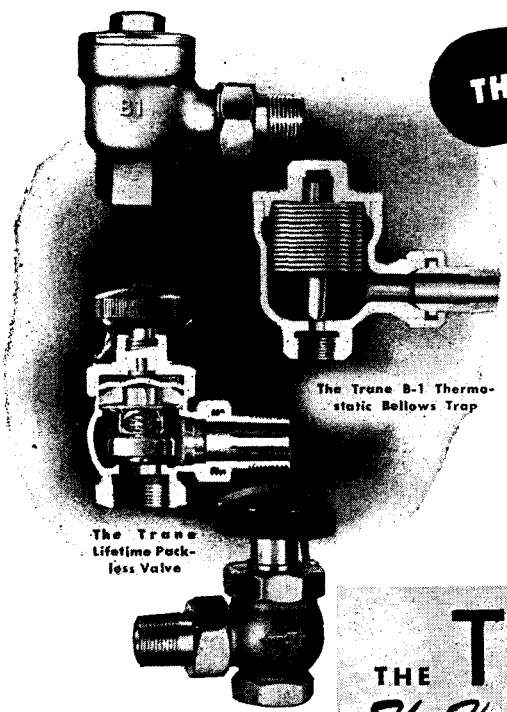
THE MOST MODERN HEATING COMBINATION

CONVECTOR-RADIATORS and HEATING SPECIALTIES

Trane Convector-radiators used with Trane Heating Specialties, either steam or hot water, provide the perfect heating method for any comfort application, large or small.

The new standardized Trane Convector-radiator can now be used economically in every type of building — its cost is no more than old-fashioned radiators, and its installation is far easier and quicker.

In addition to the packless valve that is fine enough to be guaranteed for a lifetime and the thermostatic trap with the balanced pressure bellows, the Trane Steam Heating Specialties Line includes float, bucket, and direct return traps, and vents, strainers, and other heating specialties for low and high pressure applications. The Trane Hot Water Heating Line features the Trane Circulator and includes flo valves, flo fittings, feed and relief valves in addition to other accessories for a complete system.

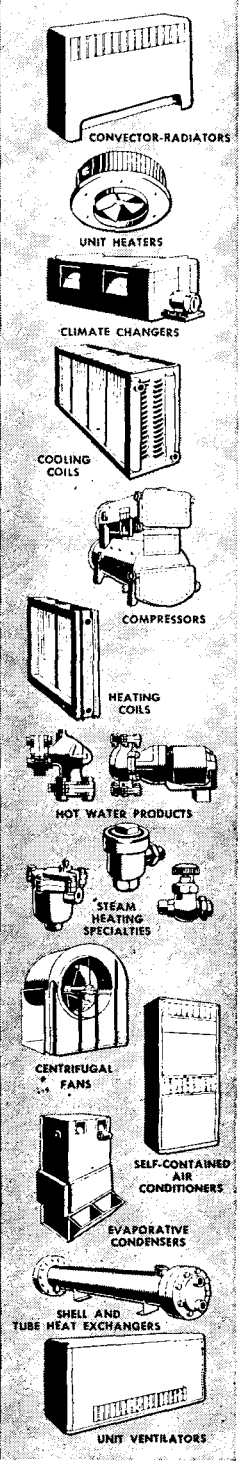


The Trane B-1 Thermostatic Bellows Trap

The Trane Lifetime Packless Valve

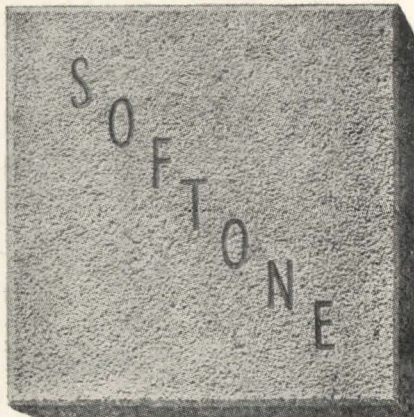
All of these Trane products are designed to be carried in local distributors' stocks.

THE TRANE COMPANY
The House of Weather Magic
 LA CROSSE • WISCONSIN
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 MANUFACTURING ENGINEERS OF HEATING AND AIR CONDITIONING EQUIPMENT



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"THAT ALL WHO COME MAY HEAR"

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AVAILABLE

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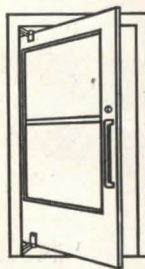
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Architect and Contractor:
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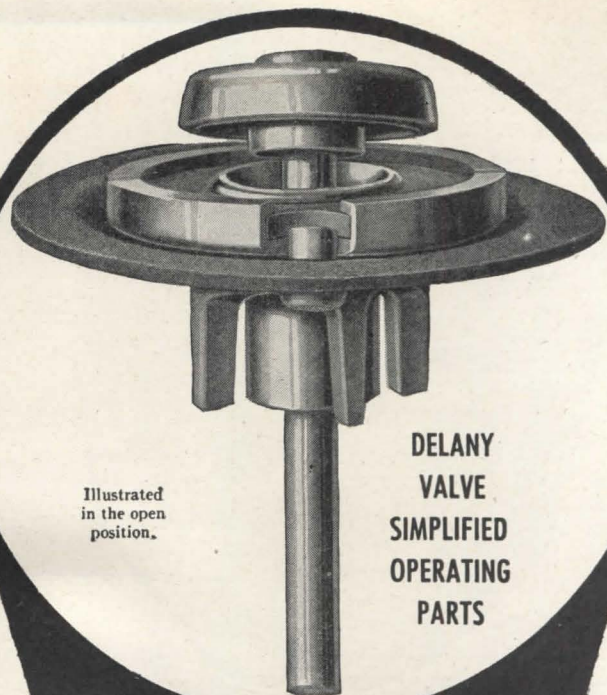
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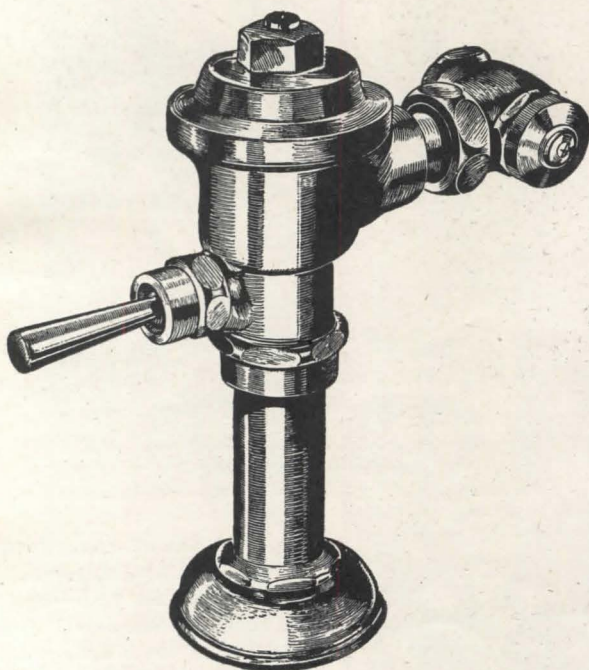
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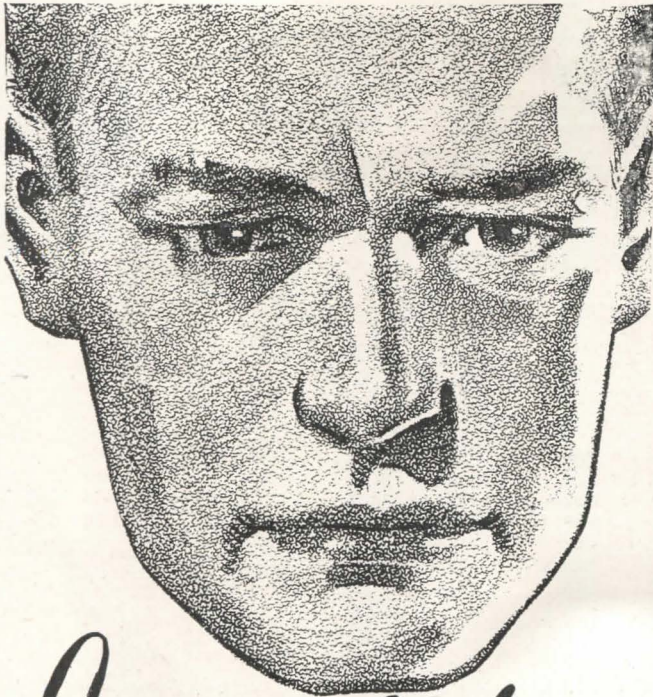
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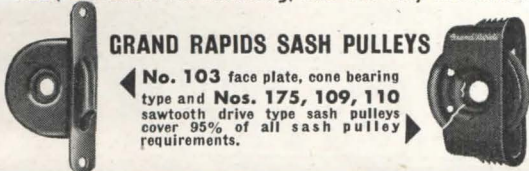
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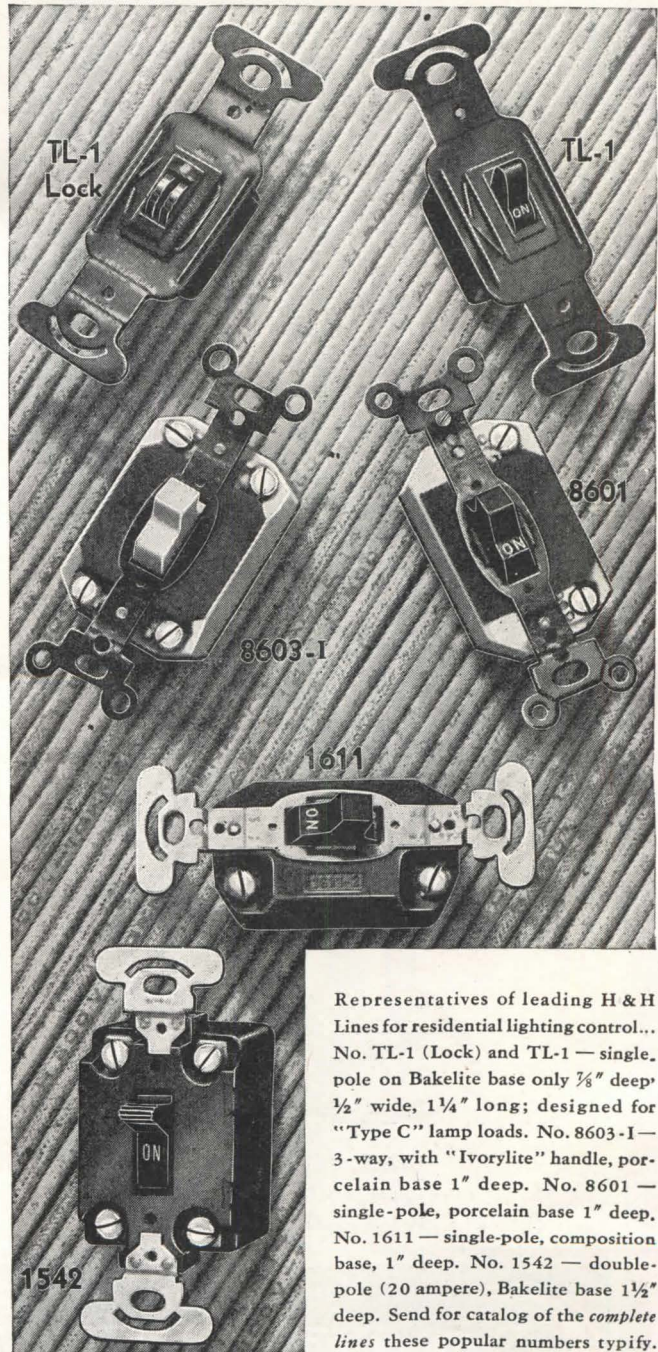
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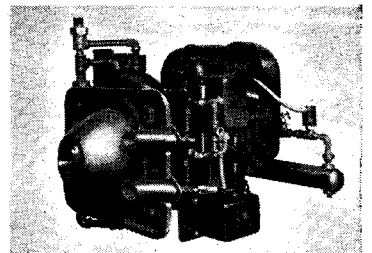
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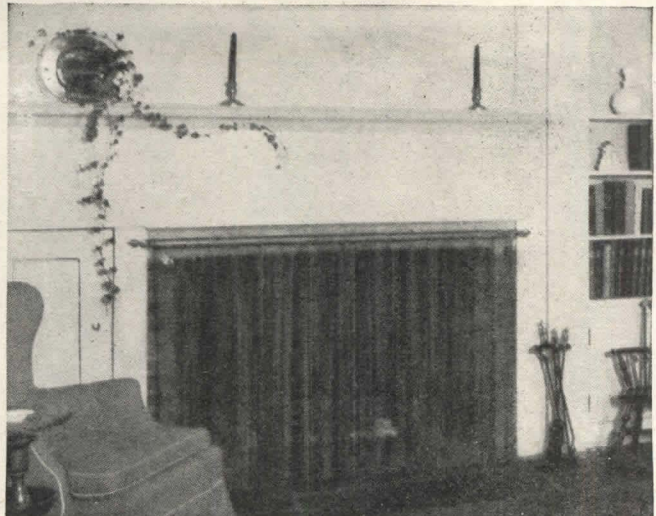
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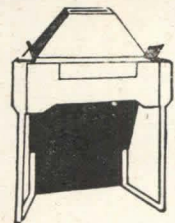
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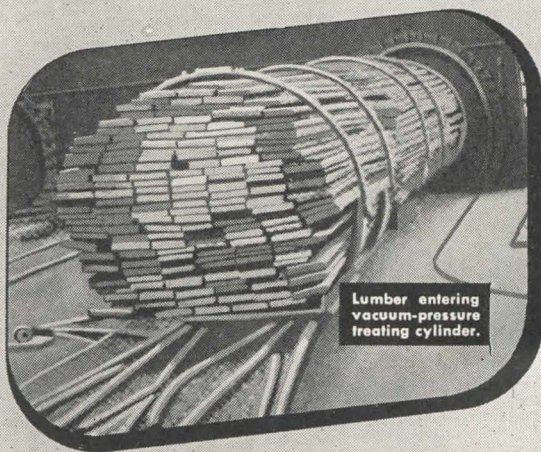
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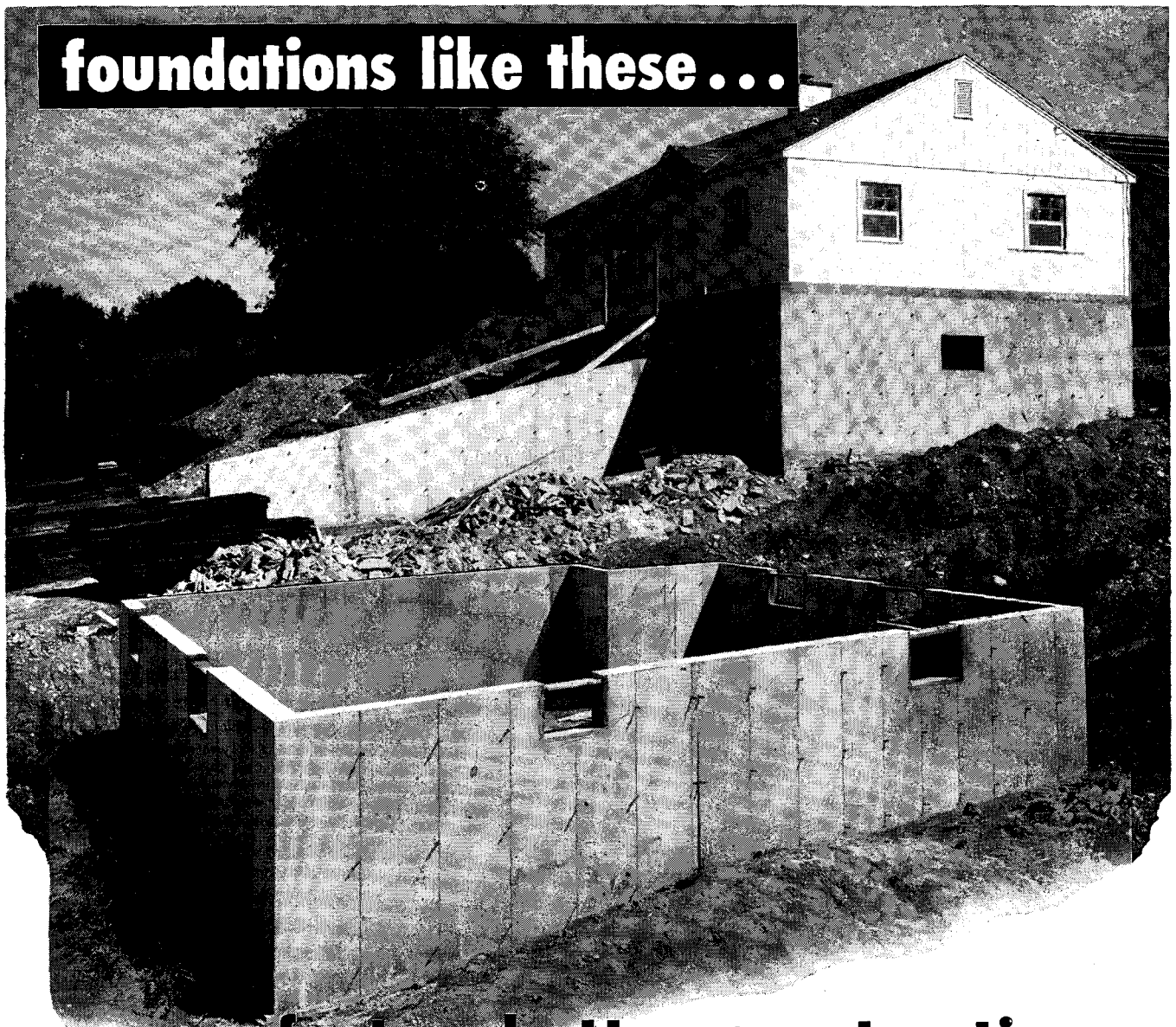
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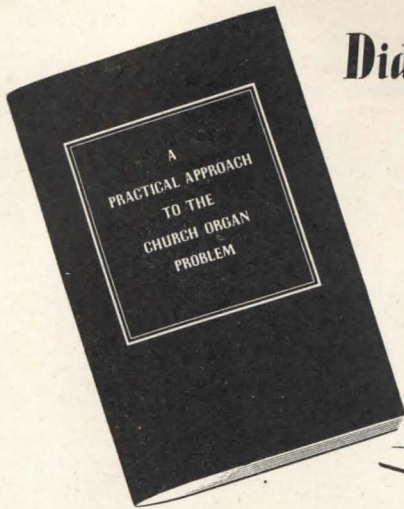


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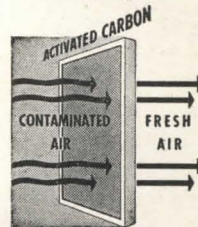
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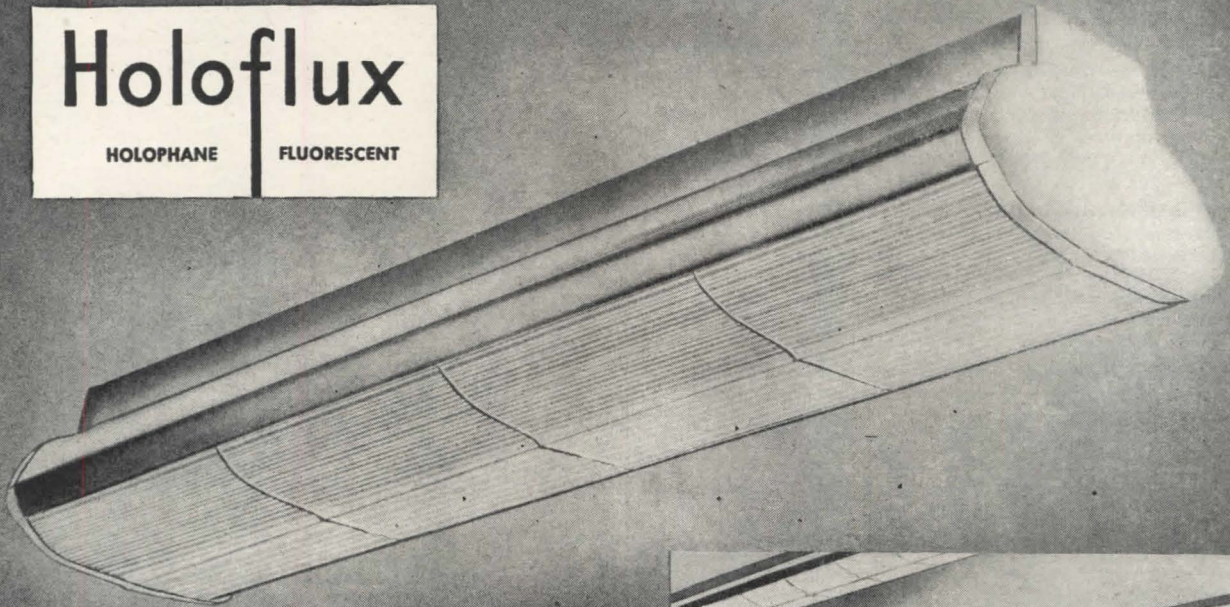
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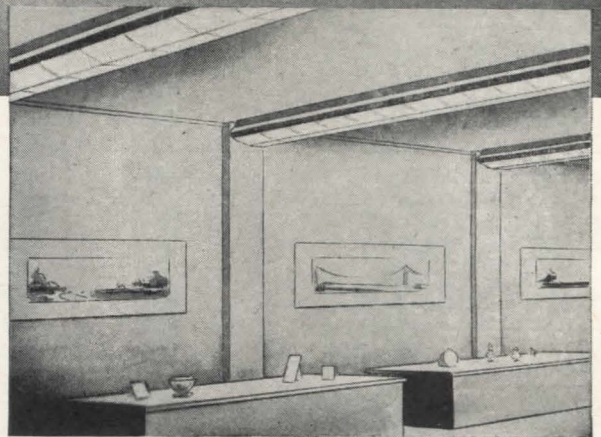
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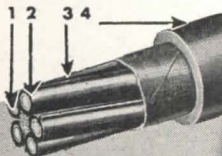
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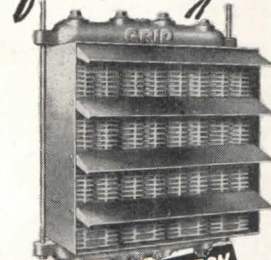
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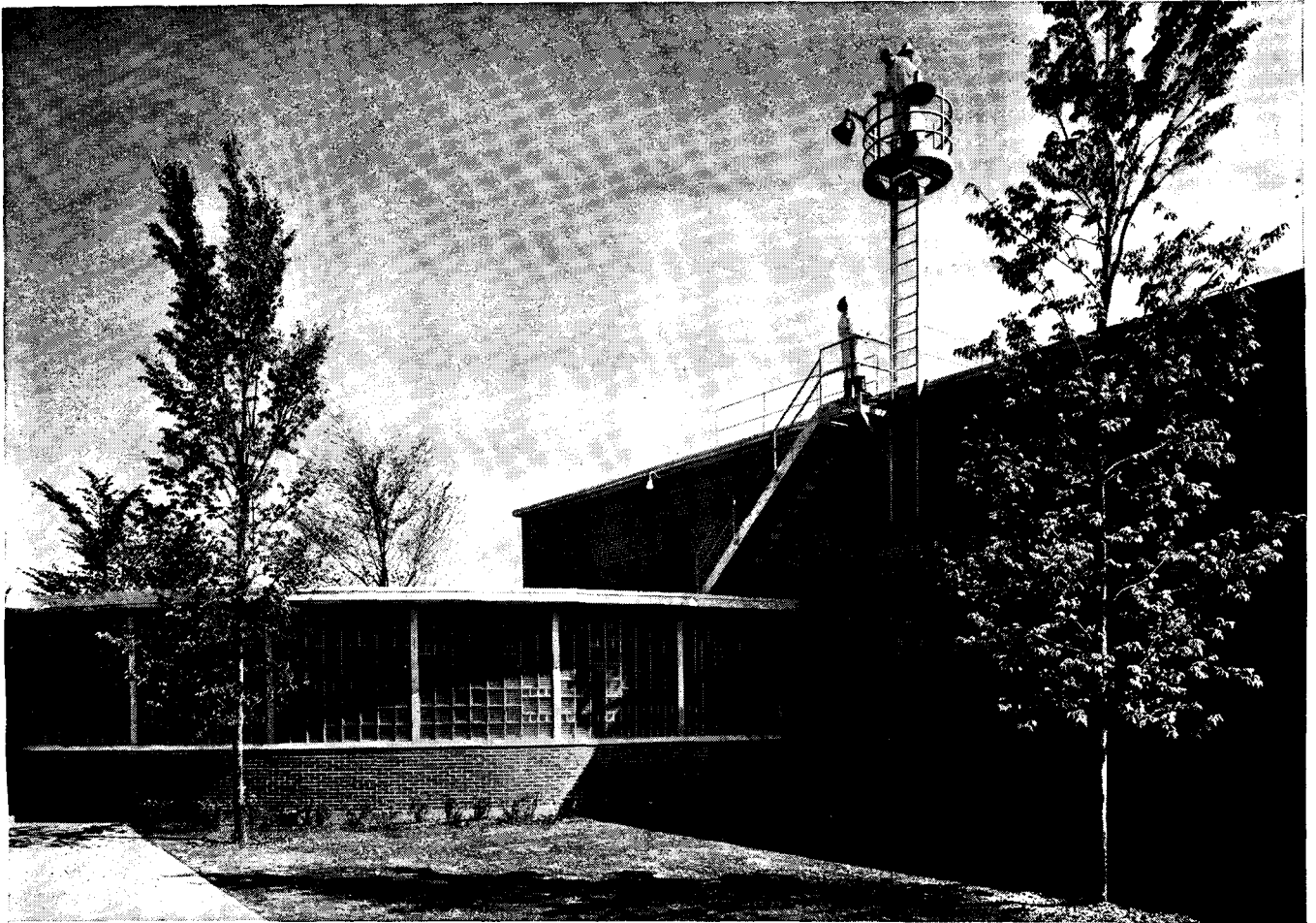
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*T. M. Reg. U. S. Pat. Off.

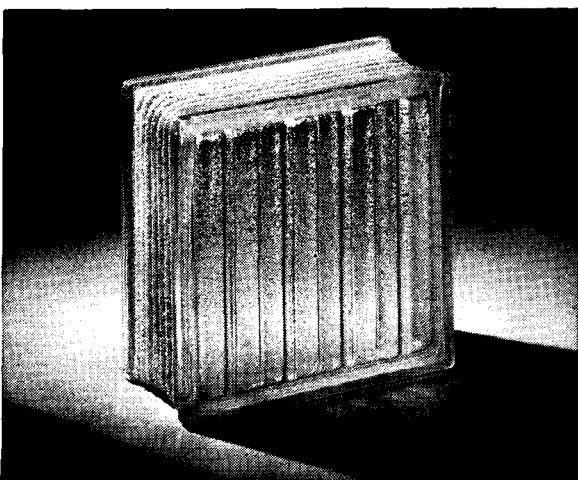
D. J. MURRAY MANUFACTURING CO., WAUSAU, WISCONSIN



A curved wall of Insulux Glass Block transmits diffused daylight in abundance to the product development model shop in Benjamin Electric Mfg. Company's splendid new laboratory at Des Plaines, Illinois. The free-hand abstract pattern of 12" and 6" square

Insulux Blocks was developed by Philip Will, Jr. to relieve monotony of the treatment. Building design by Perkins, Wheeler & Will, Chicago architects and engineers, who are well known as school building specialists.

Pattern for new thoughts on light



Insulux Glass Block is a functional building material, designed to do many things that other materials cannot do. Investigate!

Because of its functional and light-transmitting qualities, Insulux Glass Block was chosen for extensive use in this new laboratory which is dedicated to "the advancement of the science and art of illumination."

In any building, Insulux gives freedom in the direction and control of light—stimulates fresh ideas of artistic value. Insulux panels also reduce maintenance expense because they cannot rust, rot or corrode and painting is not required.

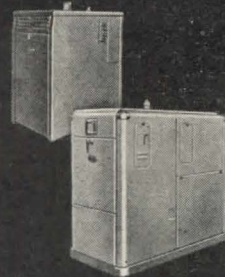
Transmission of outside noise is reduced. Dust and dirt are blocked out and frequently, the high insulating value of Insulux will reduce the cost of heating and air conditioning operations.

Architects interested in the unique advantages of this modern building material will find technical data, specifications and installation details in the "Glass" section of Sweet's Architectural Catalog, or write Dept. C-10, Owens-Illinois Glass Company, Insulux Products Division, Toledo 1, Ohio.

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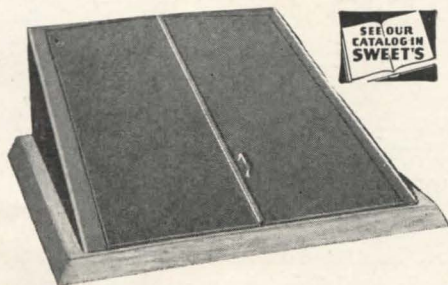
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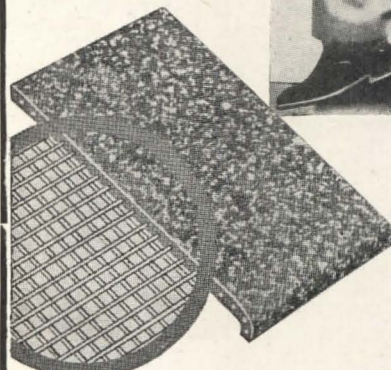
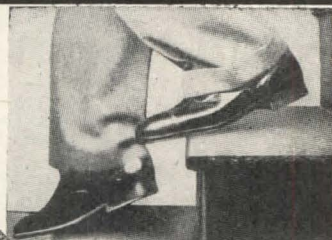
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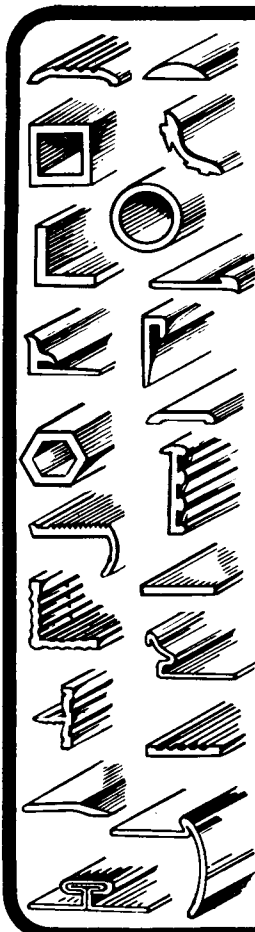


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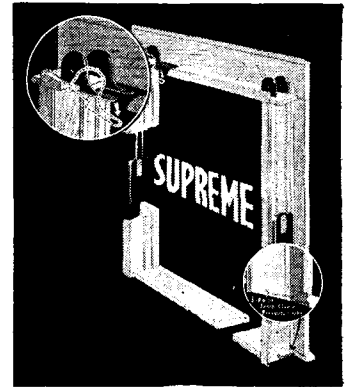
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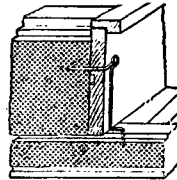
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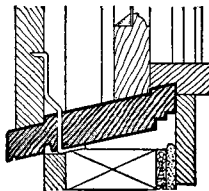
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MULL CENTER CLAMP

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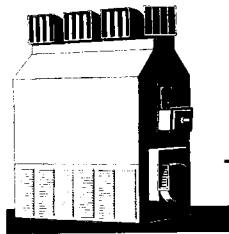
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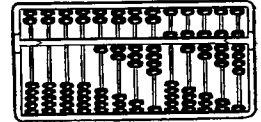
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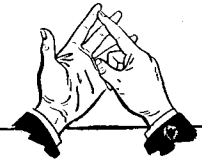
HORN MANUFACTURING COMPANY

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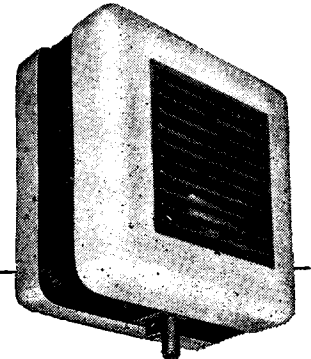
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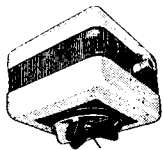


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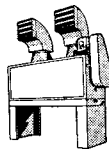
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Venturafin Horizontal
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Centrifugal Type
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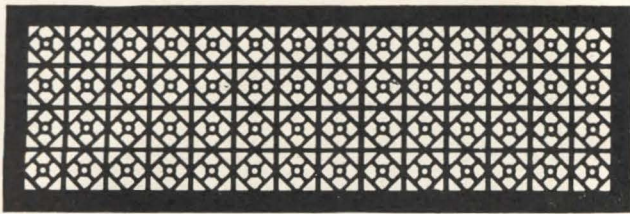


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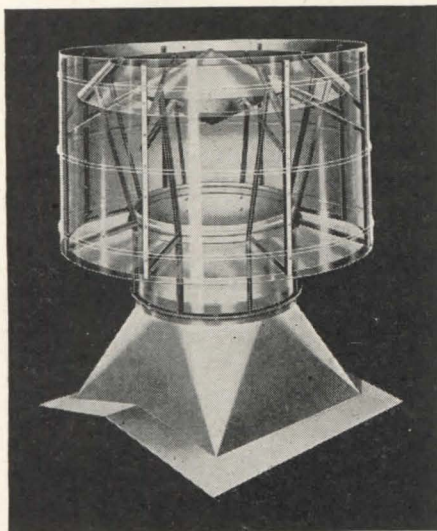
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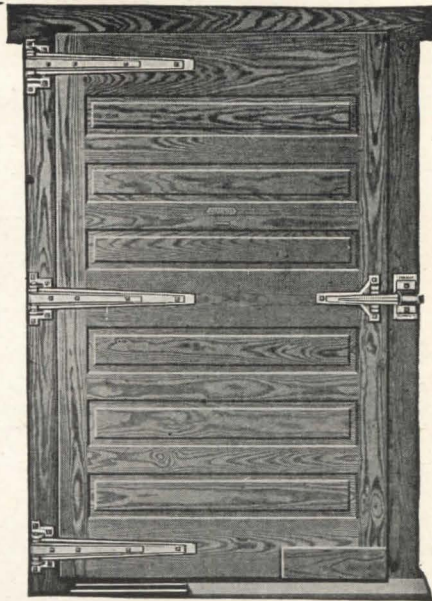
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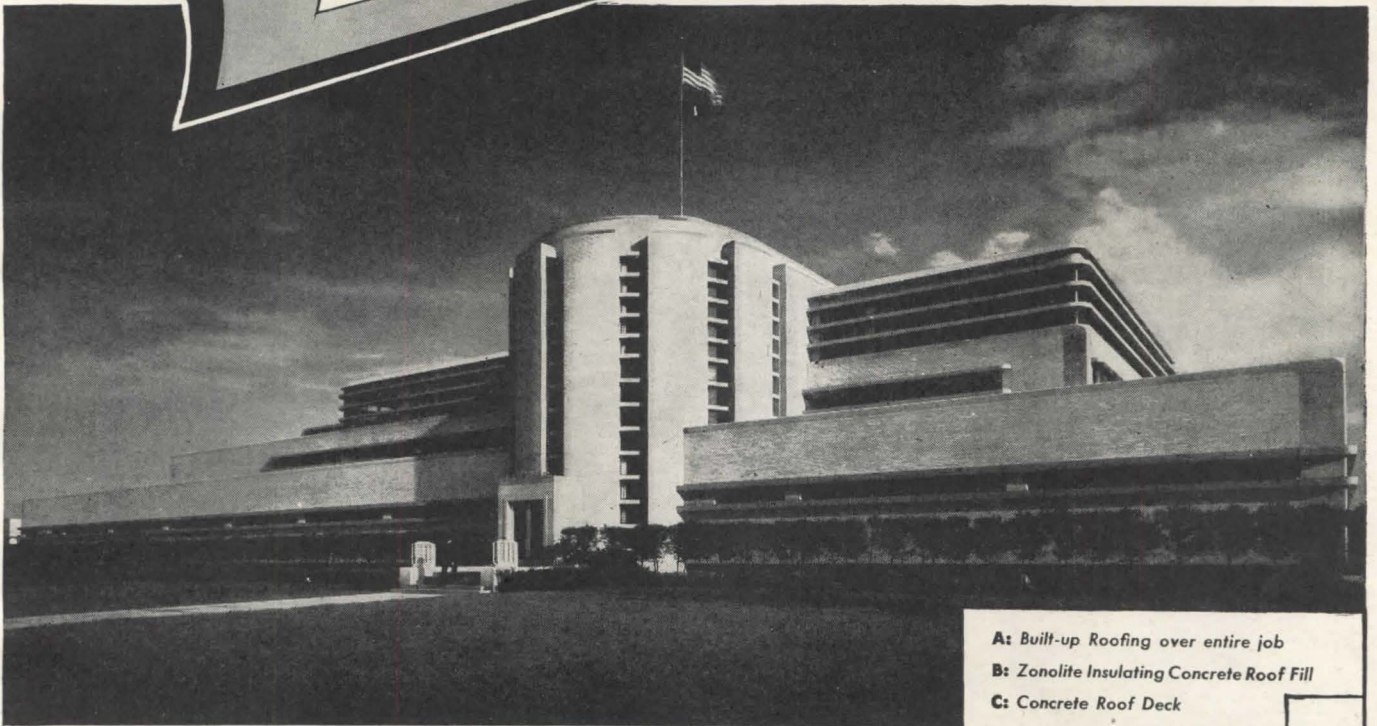


A photograph of a simulated stained glass window in fluorescent lacquer on wall board, activated by Black Light. At right, the same window in white light.

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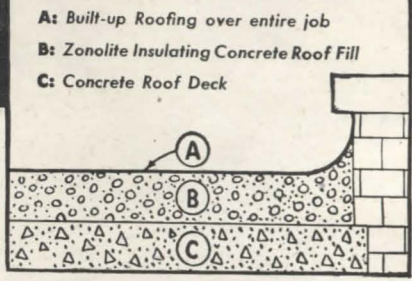
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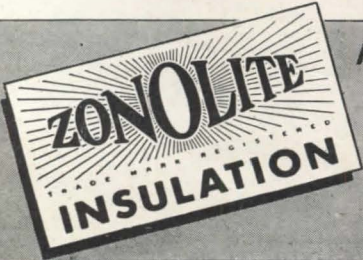


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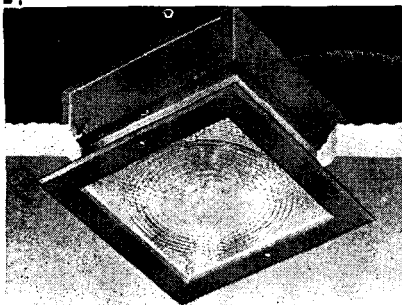
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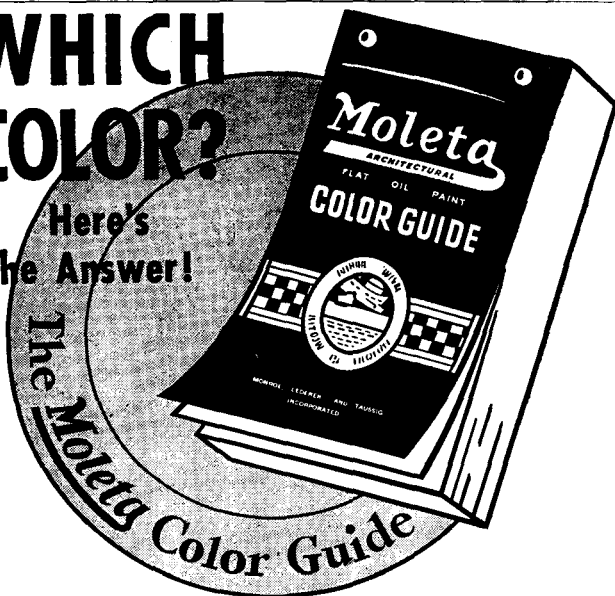
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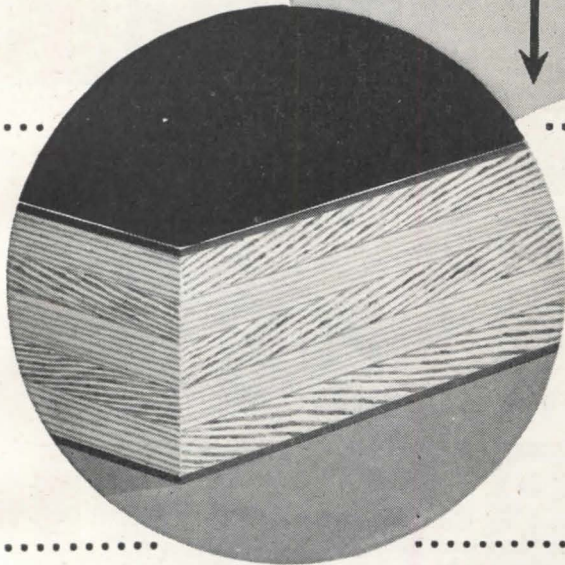
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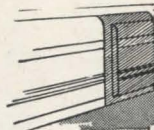
*Reg. U.S. Pat. Office

Burnham Boiler Corporation

IRVINGTON, N. Y., Dept. AR106

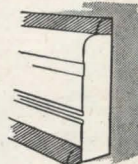
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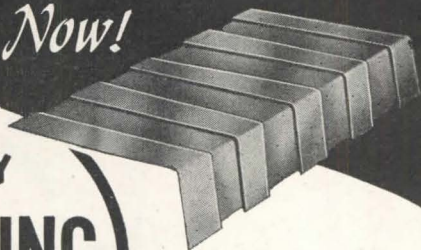
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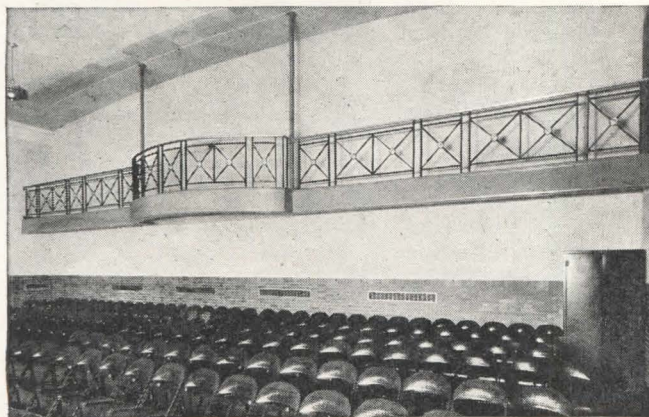
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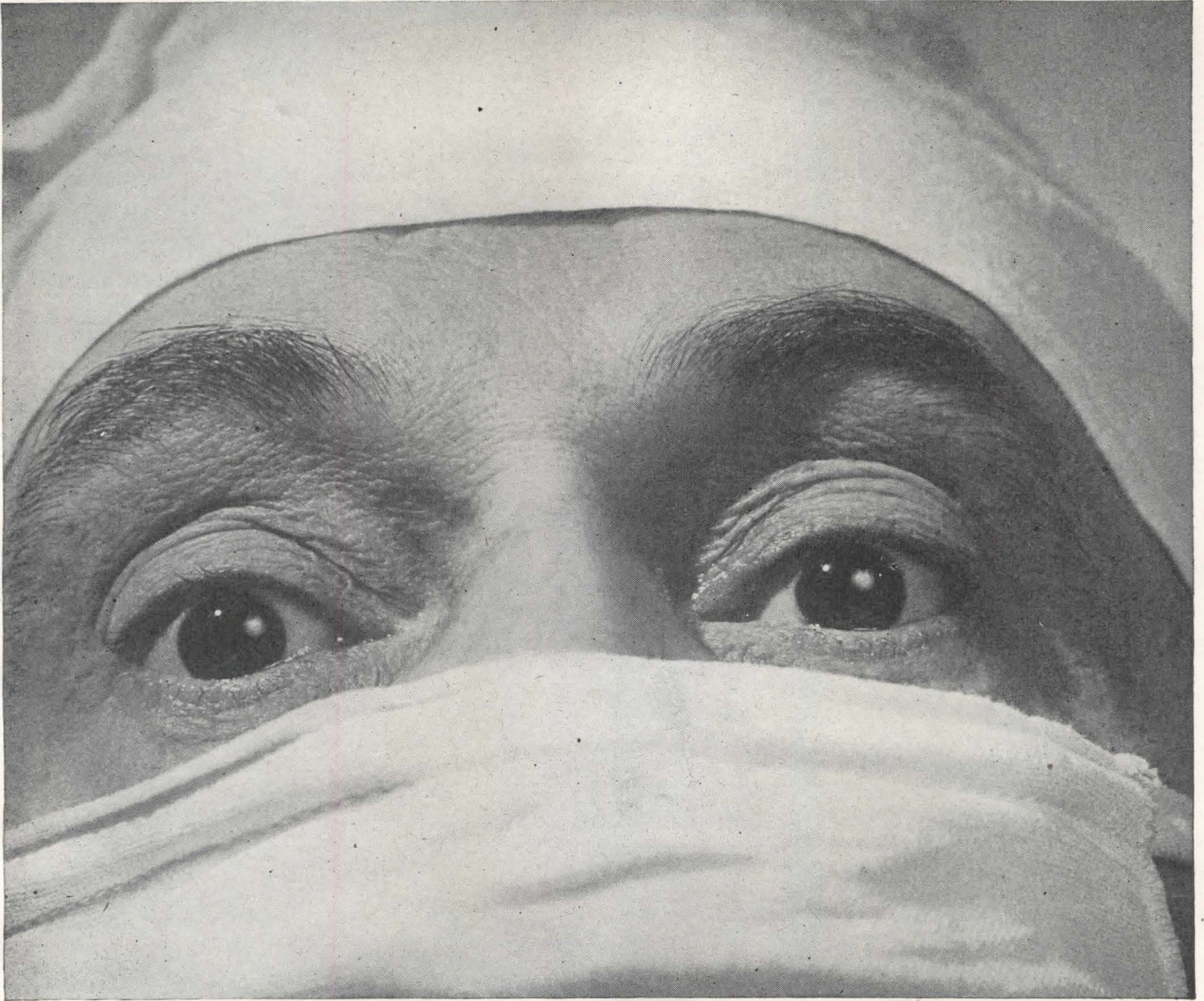
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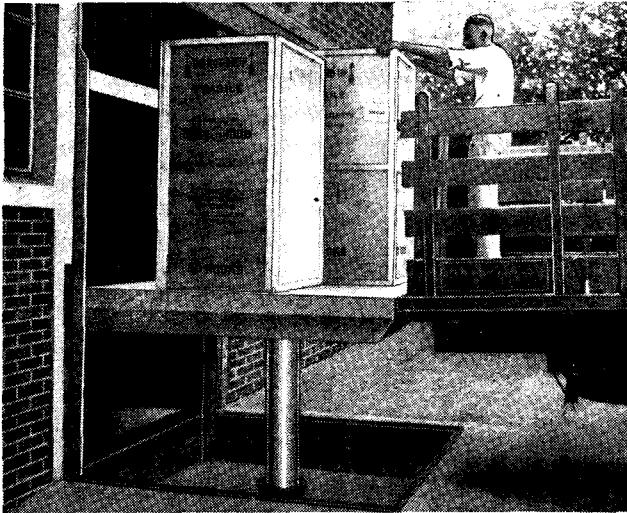
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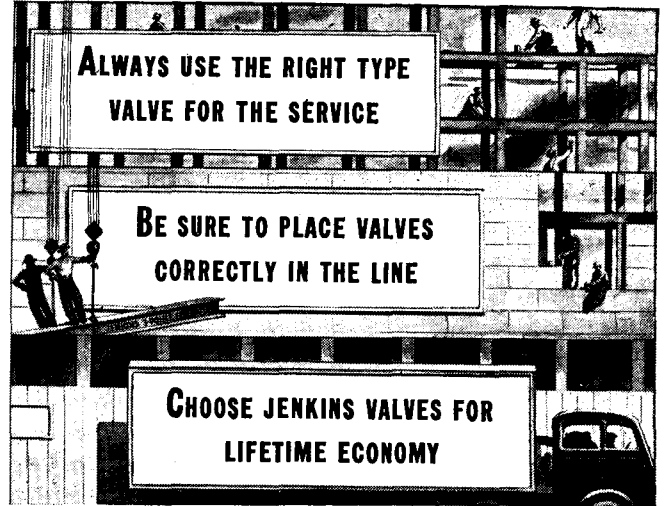
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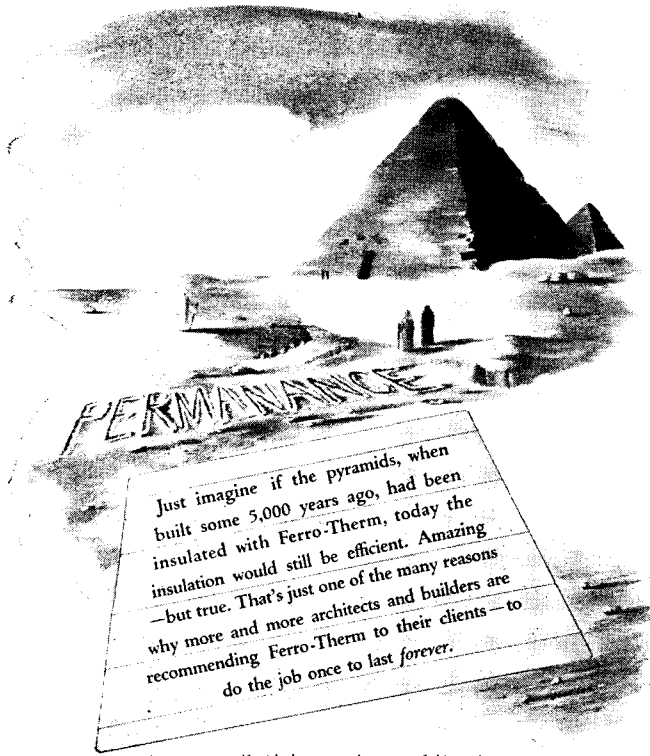
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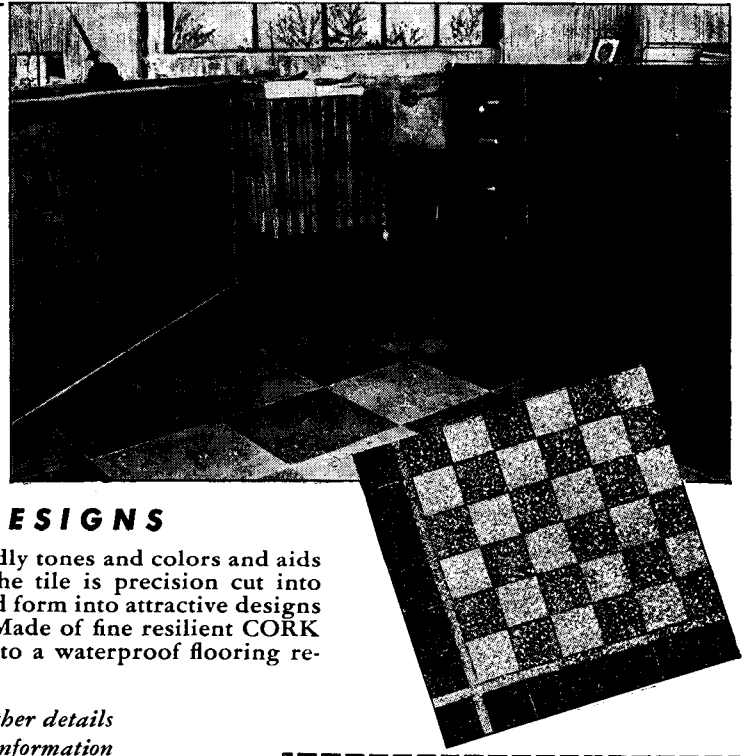
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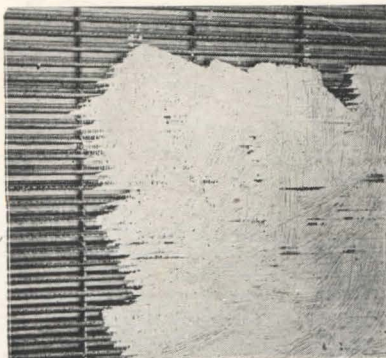
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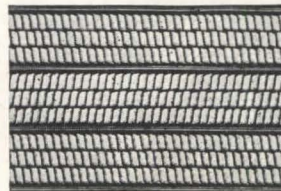
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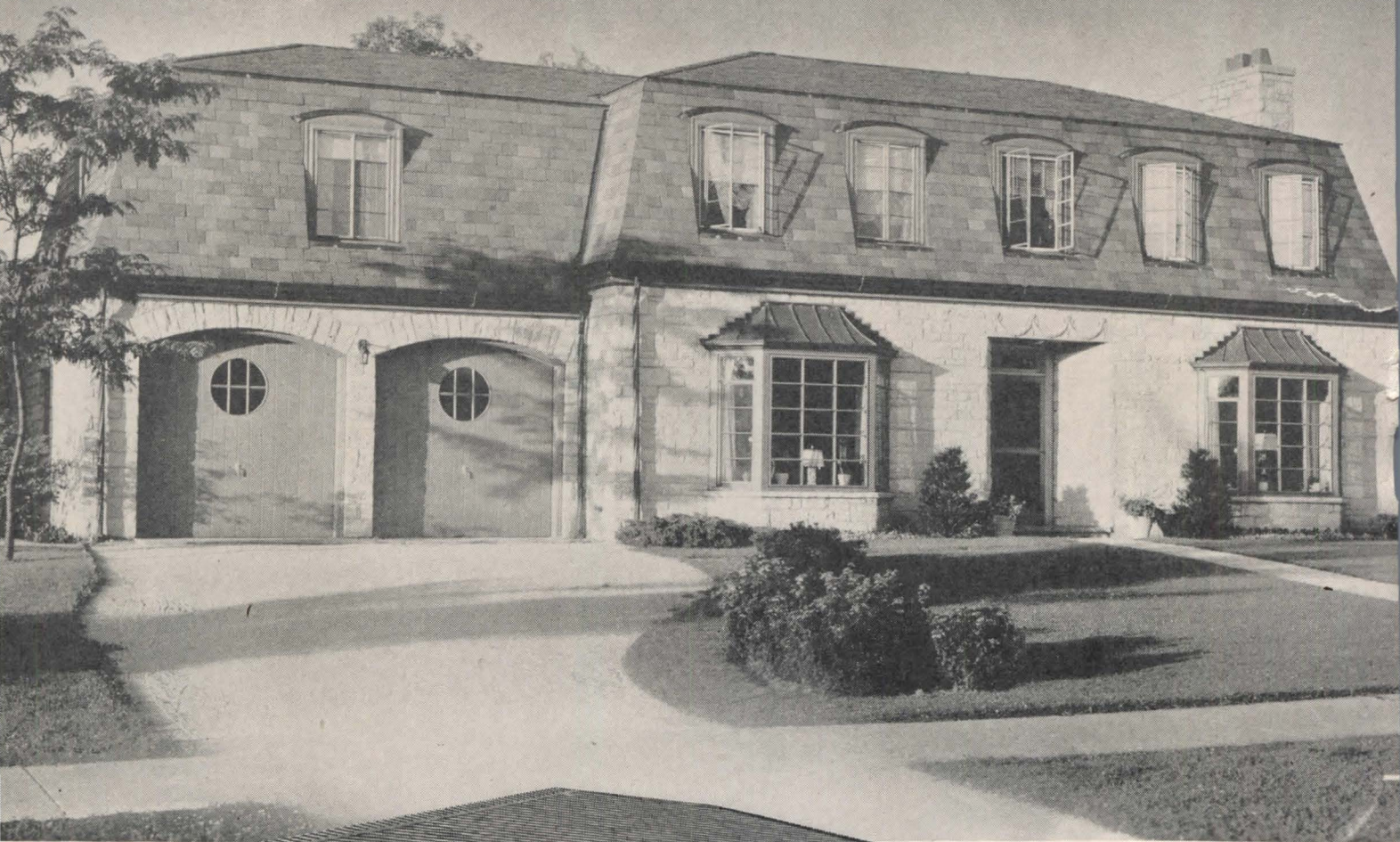
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