THE ARCHITECTURAL FORUM

FEBRUARY 1943

How to Build Exterior Walls

WITH 1 MATERIAL DOING 3 JOBS!

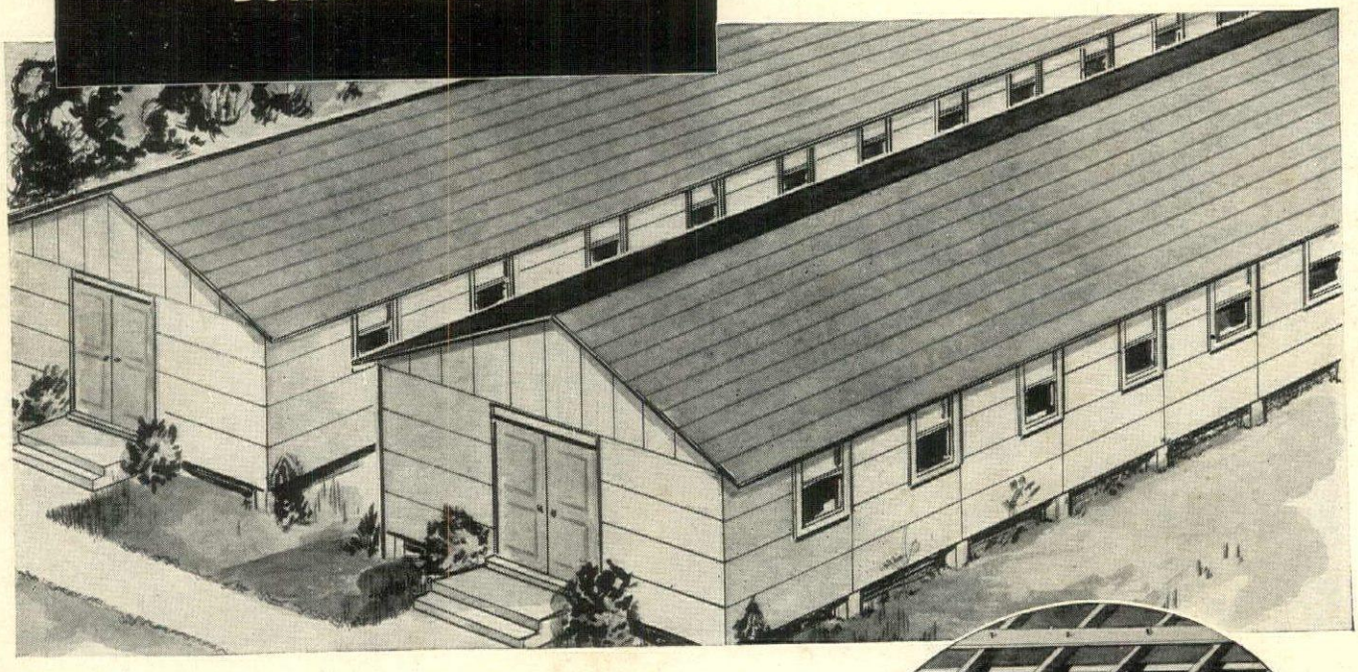
Amazing New

CELO-SIDING

1 Builds

2 Insulates

3 Provides Its Own Exterior Finish

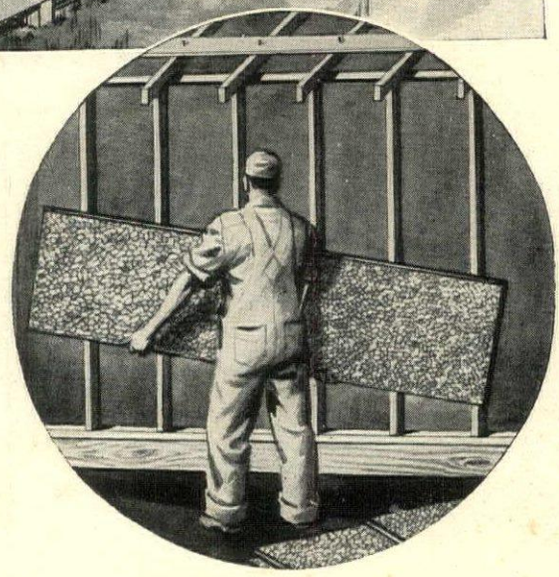


New type exterior wall units speed completion of Rugged, Weathertight Dormitories and Barracks

MOST current building is being done against tight time limits, especially in the case of dormitories and barracks. That's why architects who have worked with Celo-Siding appreciate the time-saving features of this new multi-function material. And it's equally practical for farm buildings, cabins, small factories, and similar structures!

Celo-Siding builds, insulates, and provides its own exterior finish—all in one operation. Each unit is composed of cane fibre board, coated on all sides with an asphalt compound, with an extra coating on the weather surface, into which are pressed crushed mineral granules in brown, buff, or green.

Units are 7/8" thick, and 2'x8' or 4'x8' in size. 2'x8' has T & G joints on long edges. 4'x8' has square edges all around. Each suitable for horizontal or vertical application. All joints are sealed with caulking compound. Mail the coupon for complete information.



CELOTEX

REG. U. S. PAT. OFF.

ROOFING • INSULATING BOARD

ROCK WOOL • GYPSUM WALLBOARD • LATH

PLASTER • ACOUSTICAL PRODUCTS

THE CELOTEX CORPORATION • CHICAGO

THE CELOTEX CORPORATION, AF 2-43
CHICAGO, ILLINOIS

Please send complete information and samples on new Celotex Celo-Siding.

Name .....

Address .....

City .....

County ..... *State* .....

ARCHITECTURAL FORUM

FEBRUARY 1943

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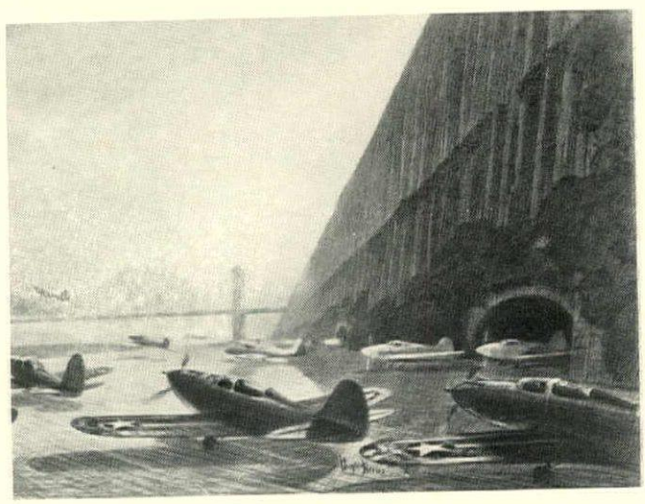
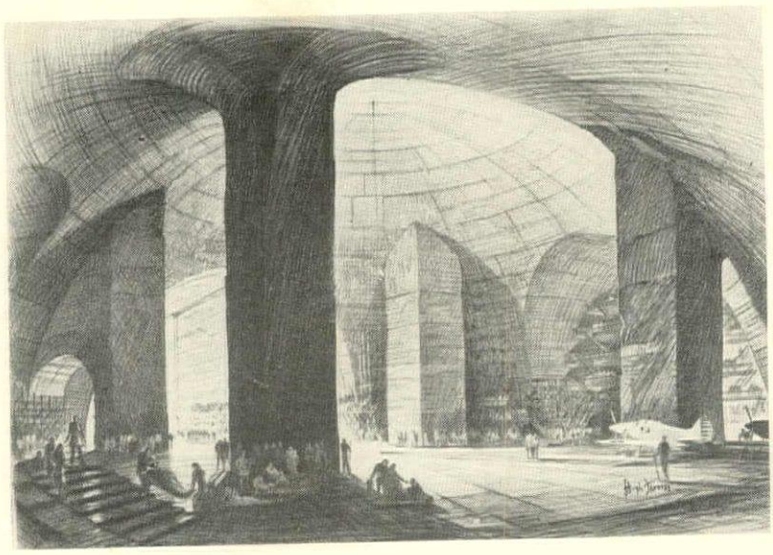
VOLUME 78—NUMBER TWO

CAVES FOR NEW YORK

One of the oddest contradictions in our super-mechanized, global war is that the cave has been raised to a position of usefulness and general esteem it has not enjoyed since man's worst enemy was the mastodon. Powerful planes and four-ton block busters have done terrific damage since the war began, but the places equipped with good old-fashioned caves—Malta, Chunking, Gibraltar—have carried on very well in the face of both raids and threats. This fact produced the idea shown here, a scheme to blast enormous shelters in the Palisades, the great cliffs which face Manhattan across the Hudson River. Conceived by George J. Atwell, head of the largest foundation company in the country, the project involves construction of a rock-hewn tunnel 100 feet high, 200 feet wide and a mile and a half long. The plan provides a series of self-supporting vaults, each large enough to shelter 200,000 persons, with additional space for munition plants and fleets of fighter planes. Its cost is estimated at $37,500,000.





The illustrations by Hugh Ferriss show tunnel entrances (above) with a landing platform for fighter planes. At the left is a view of one of the vaulted rooms. A major weakness of the scheme appears in the large drawing: New York residents would have to cross the river in ferries and barges to reach the shelters, a slow, exceedingly cumbersome and possibly disastrous procedure. Co-author of the scheme is John Evans, Chief Engineer of the Port of New York Authority.

THE ARCHITECTURAL FORUM

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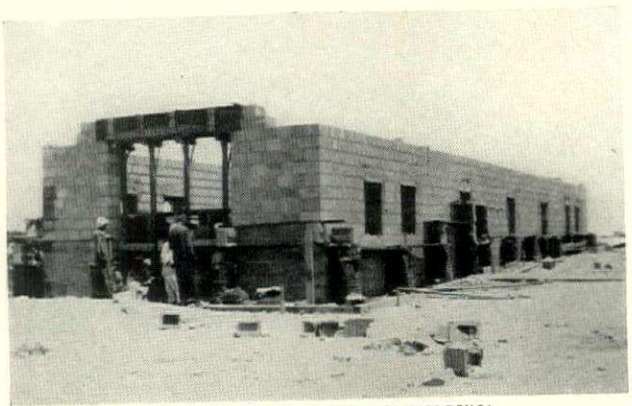
VOLUME 78
Number 2

AFRICAN TRANSPORT

EMBURY'S ODYSSEY

Among the U. S. military construction projects going on all over the globe, few can compete for size or difficulty with work in the area around Eritrea. Here in an immense region which takes in 10,000,000 square miles of land and sea, including parts of Africa, Egypt, Palestine, Arabia and Iran, there are now air and naval bases, tremendous repair and assembly shops, hospitals, roads and barracks. A few months ago, New York architect Aymar Embury, now chief engineer for the contracting and engineering firm of Johnson, Drake & Piper, flew into the heart of this area to check on the progress of work. Thirty-five days later he returned, having covered 30,000 miles, with a lot of fuzzy snapshots, tall tales, and a firm resolve never to take such a trip again. Eritrea, said Explorer Embury, is an incredibly mountainous country the size of New England, with 35,000 underfed inhabitants. Its most precious commodity is water. One can get from the seacoast (temperature 120°, humidity 92°) to the capital (8,000 feet altitude) in four hours of hard driving; the same trip takes eight minutes by plane. Work is done by natives of half a dozen countries and by Italians, many of whom are prisoners. Buildings include structures of prefabricated steel (conveniently left intact by the Italians), a whole CCC camp found in a U. S. warehouse and shipped out, and buildings of brick and cement block from plants erected by the contractor. The job, covering many large projects in many countries, was completed in about a year with the worst possible conditions of climate and labor. Best story: the captured Italian general, who took a job as electrical draftsman for $1.10 per day. The general, an amiable individual who apparently liked the Fascist regime as little as his captors, was distressed to find work hampered by a lack of power, and he took a crew into the back country and unearthed thousands of horsepower of first-rate Italian generating equipment, hidden in an old mine before the Army capitulated. "This find" says Mr. Embury, "helped the job even more than those wonderful ten-ton Fiat trucks we came across a little earlier."

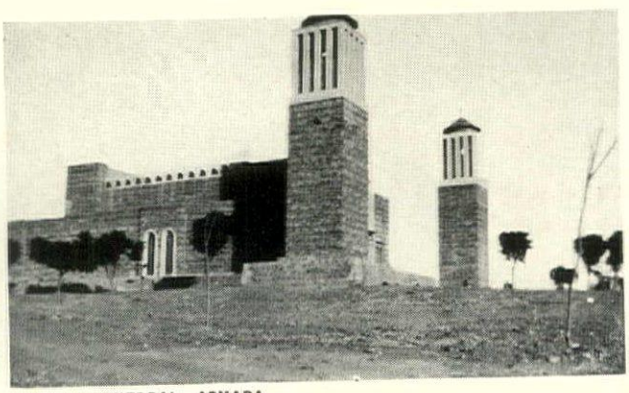
ARCHITECT ROWLAND, AYMAR EMBURY, ENGINEER OFFICER JACOBS



CEMENT BLOCK, AFRICAN STYLE (NOTE SCAFFOLDING)

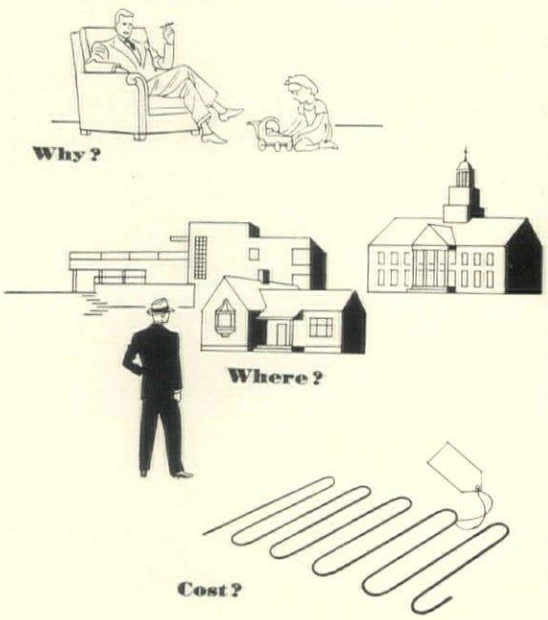
AFRICAN BARRACKS, CCC STYLE

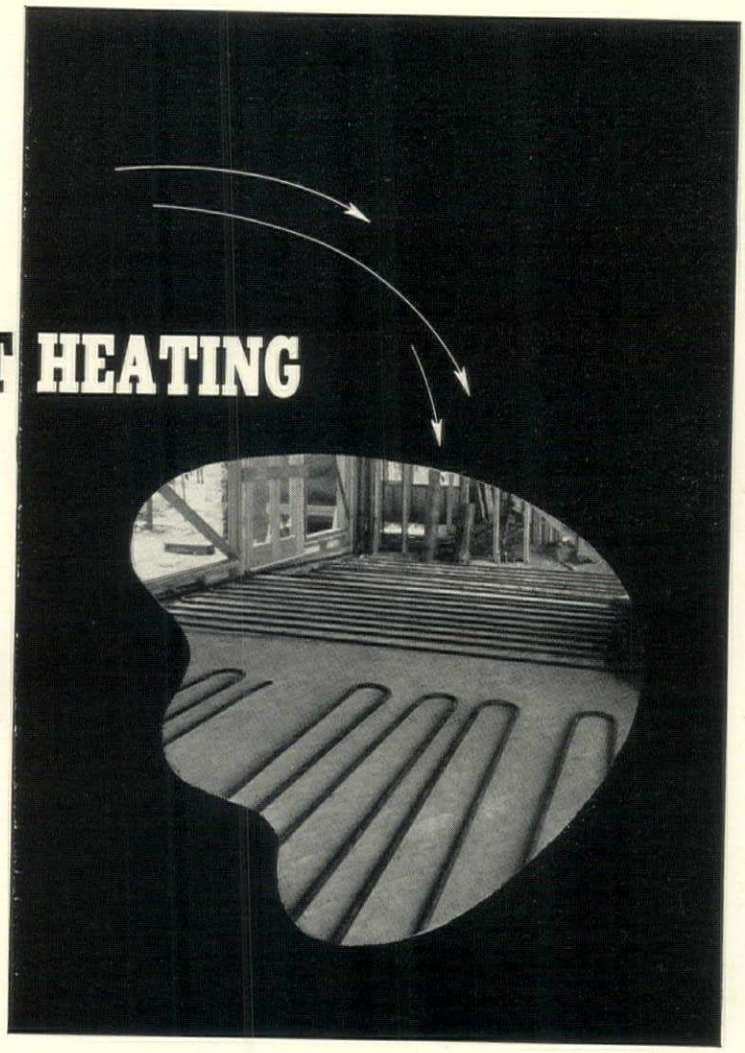
ITALIAN MACHINE SHOPS AND PREFABRICATED BUILDING



COPTIC CATHEDRAL, ASMARA

Do you know all the answers to questions on **RADIANT HEATING**





War has boomed some types of building, but an even greater construction program is concurrently under way *in people's heads*. The homes, the plants, the schools, hospitals and churches deferred till peacetime are now taking form and shape in the minds of future owners.

Naturally a lot of thought is centering around heating in general, and Radiant Heating in particular. You have undoubtedly been questioned about it: "What are Radiant Heating's advantages?" "Where can it be used?" "Can I afford it?"

Satisfactory answers must be in human, rather than technical terms, and we have a reservoir of source material. For instance:

. . . The man who reported that Radiant Heating saved his furniture; his dogs found the Radiant-Heated floor more comfortable to sleep on.

. . . The man who "never tired" of searching for the cold-spots present in all other houses . . . but absent in his.

. . . The young couple who luxuriated in the opportunity, provided by Radiant Heating, of doffing shoes as well as wraps at their front door.

. . . The gloating householder whose friends had fuel bills of $20 and $22, while his (in a comparable house, Radiant Heated) was only $13.13.

. . . The man whose wife "found to her amazement she had to turn the thermostat down day after day . . . we now find a 60 degree setting most favorable."

. . . The employer who reported (1) fewer creaking joints among old employees, and (2) lowered clothes-pressing bills, as two of many dividends from Radiant Heating.

These are not cited as typical, but merely to suggest the range and variety, which permit almost every ordinary query to be answered in terms of some user's actual experience.

Because Byers Wrought Iron combines—to an unusually high degree—the qualities of corrosion resistance, thermal properties, and ease of fabrication essential for Radiant Heating coil material, we have been closely identified with this new development for years. Our bulletin "Byers Wrought Iron for Radiant Heating Installations" will give you full information, and also equip you to answer the queries of interested prospects. May we send you a copy?

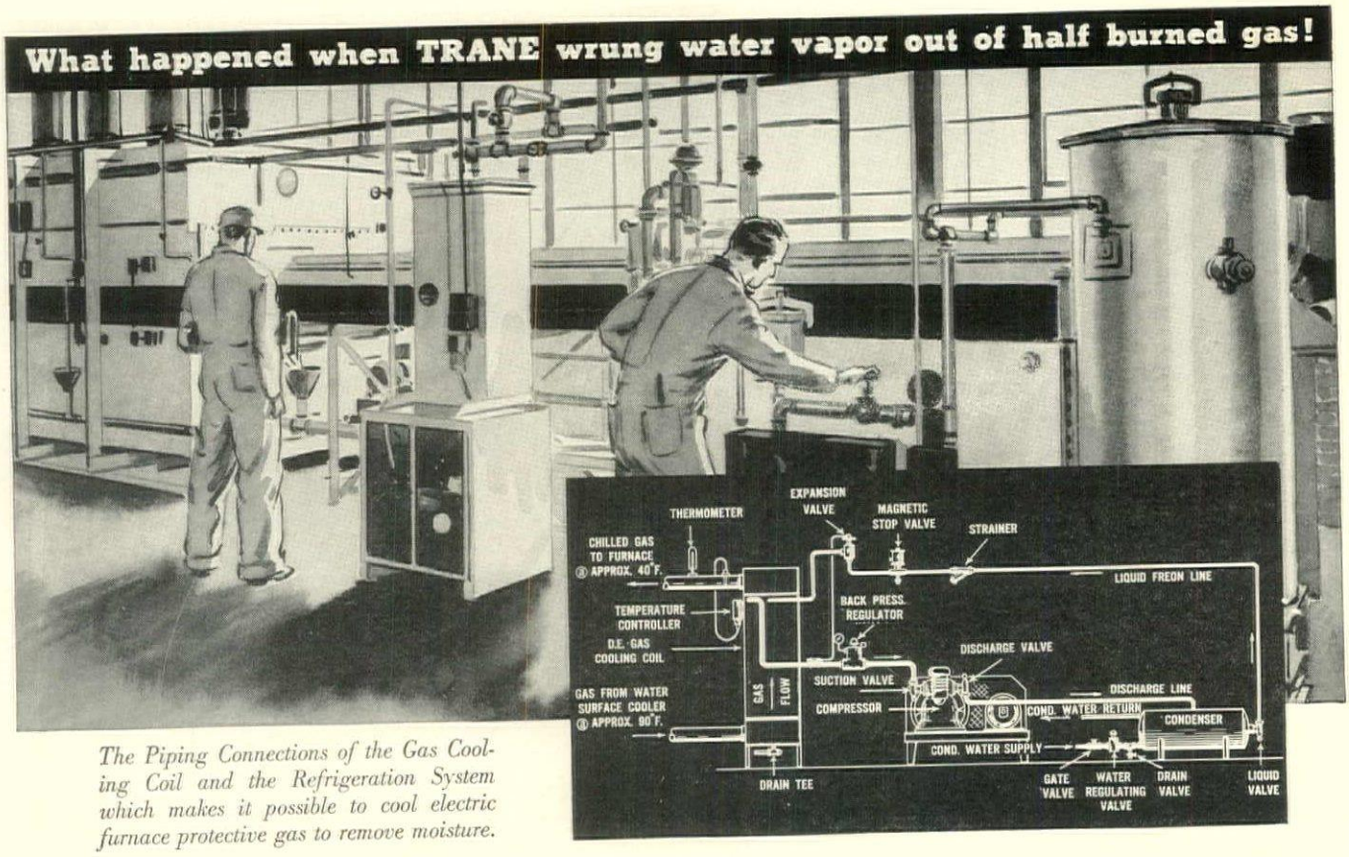
A. M. Byers Company. Established 1864. Offices in Pittsburgh, Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston, Seattle, San Francisco.

BYERS WROUGHT IRON

FOR EXTRA SERVICE
IN CORROSIVE APPLICATIONS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

What happened when TRANE wrung water vapor out of half burned gas!



The Piping Connections of the Gas Cooling Coil and the Refrigeration System which makes it possible to cool electric furnace protective gas to remove moisture.

Protective atmosphere solves war production problem that saves precious metals and machine tools

THE ELECTRIC Furnace Company, Salem, Ohio, an important manufacturer of heat treating equipment, had to create a protective atmosphere in the sintering furnace it produced. In powdered metallurgy, the method that saves machine tools and materials in the manufacture of bushings and single articles for vital war industry, powdered metal is placed in the form desired, subjected to tremendous hydraulic pressure and then treated in the sintering furnace. The protective atmosphere was required to prevent oxidation and scaling created by the air in the furnace.

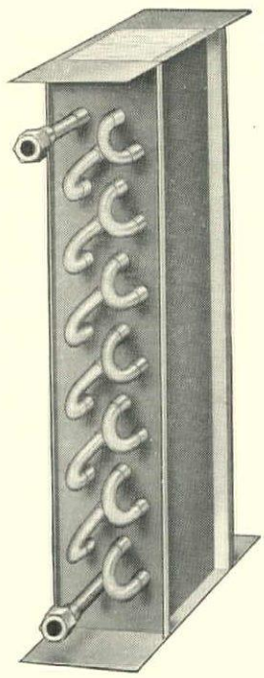
It has been found that this protective atmosphere can be produced most economically by partially burning commercial fuel gas. Unfortunately, however, this burning process produces water vapor which is also an oxidizing agent. Only a very low water vapor content is permissible for satisfactory results.

Condensation of the water vapor seemed to be the most effective way to do the job—especially since water at ordinary temperatures could be used to cool the gas. Tests, however, showed that the temperature of the gas could not be reduced sufficiently for the required degree of water vapor removal.

To solve the problem, Trane Air Engineers provided a special gas cooling coil. A direct expansion refrigerant was circulated through this coil. The temperature was reduced almost to freezing.

Thus Trane provided the means for a truly protective atmosphere completely free of all harmful oxidizing effects.

As in this and hundreds of other cases, the facilities of the Trane design engineering department are at the disposal of government and industry in the design of new and refined equipment to speed the war effort. Your nearby Trane Field Office will be glad to furnish details.



This Unit Cools Protective Atmosphere to Remove Dangerous Moisture

The Trane Gas Cooling Coil, utilizing a direct expansion refrigerant, cools partially combusted gas from 90° to 40°, thereby removing dangerous water vapor in a vital heat treatment process. This represents another of the many problems solved through the use of Trane Heat Transfer Equipment of both standard and special design.

THE TRANE COMPANY

LA CROSSE, (AIR) WISCONSIN

Also TRANE COMPANY OF CANADA LTD., TORONTO, ONTARIO

HEATING • COOLING • AIR CONDITIONING EQUIPMENT FROM 85 OFFICES

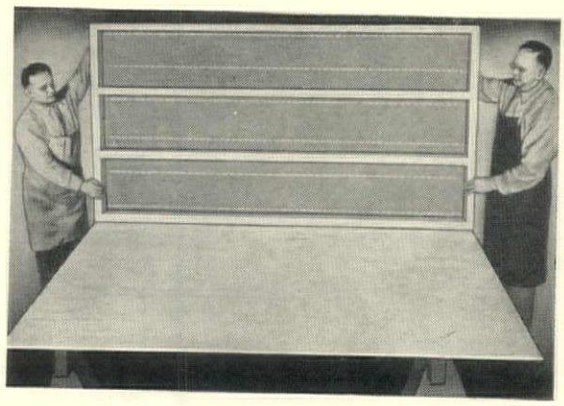
Today it's **EXTRA SPEED** *that counts!*

And here's **EXTRA SPEED** *for wartime builders:*

KIMSUL* Insulation saves valuable installation time!

★ Developed especially to speed the insulation of war housing projects, a new giant-size KIMSUL* Insulation blanket makes dramatic savings in time required for installing.

Now made in widths of 4 feet and wider in some specifications — and as long as 250 feet — the new KIMSUL covers an entire prefabricated wall or floor unit in a single operation. Huge KIMSUL blanket is stapled direct to framing members . . . gives neat, snug-fitting insulation job shown in photo at right. Sheathing, flooring or interior finish is attached right over KIMSUL . . . compression holds KIMSUL blanket firmly in place . . . KIMSUL won't sag, sift or settle.



Job studies indicate that as much as 1,000 sq. ft. of construction can be insulated with new giant-size KIMSUL in as little as 1¾ hours! And once installed, KIMSUL saves fuel as effectively as it saves man hours . . . conductivity is .27 Btu/hr./sq. ft./deg. F./in. (Peebles). Write for full information now!

*KIMSUL (trade-mark) means Kimberly-Clark Insulation.

KIMSUL SAVES EVERY WAY!

Different from all other insulations, KIMSUL comes in rolls *compressed* to 1/5th its installed length. As compared with non-compressed insulations, KIMSUL requires only 1/5th as much transportation space . . . only 1/5th as much storage space . . . only 1/5th as much handling.

KIMBERLY-CLARK CORPORATION
Established 1872
Building Insulation Division
Neenah, Wisconsin

AF-243

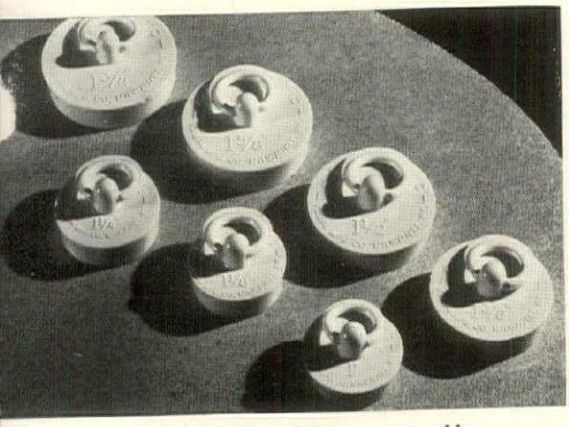
☐ Send a representative.
☐ Send FREE booklet.

*Name*_____

*Address*_____

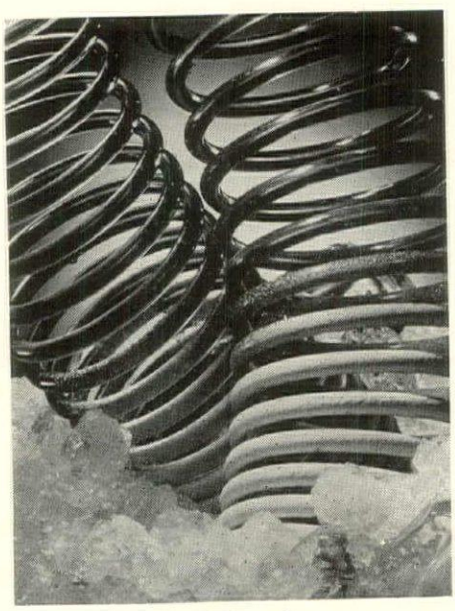
*City*_____ *State*_____

Building Reporter



1. Plastic sink-stoppers save rubber

2. Dehumidifier uses noncritical materials



3. Transparent plastic beer pipe

DRAIN STOPPERS are molded of plastic instead of rubber (left 1).

Name: Lumarith Drain Stoppers.

Purpose: To conserve rubber.

Features: Stoppers are clean, attractive, and so light in weight that shipping costs are materially reduced. Available in all sizes from 1 to 1¾ in. dia.

Manufacturer: Kampa Mfg. Co., 12132 West Capital Dr., Milwaukee, Wis.

AIR-DRYING UNIT made of nonessential materials (left 2).

Name: Household Dri-Air Unit.

Purpose: Absorption of excessive moisture from air in enclosed spaces.

Features: Compact unit is constructed of treated wood with a walnut finish. It supports double bags of long-wearing mesh material which hold 10 lbs. of Dri-Air chemical powder. The design of the unit provides maximum surface exposure for the holders so that the powder rapidly absorbs excess moisture. Powder is clean, odorless, highly-concentrated, nonpoisonous. As moisture is absorbed from the air, it dissolves the powder which drips into the tray at the bottom of the unit, permitting the addition of more powder at the top of the baskets. Ten lbs. of powder absorb from 10 to 30 lbs. of moisture, depending upon air temperature. One unit is suggested for each 1,000 to 1,200 cu. ft. of space. Also available is a Commercial Tripod Dri-Air Unit designed for warehouse, factory and store use. This unit has a wood tripod under which 10 lbs. of powder can be suspended in a large mesh bag —drippings are collected in user's own bucket or pan. Prices: Household Dri-Air Unit, $4.70; Commercial Tripod Dri-Air Unit, $3.75; 10 lbs. of powder, 85¢; replacement bag, about 30¢.

Manufacturer: Tamms Silica Co., 228 North La Salle St., Chicago, Ill.

PLASTIC PIPE found suitable for use in commercial ice-cooling systems and for direct draw systems with automatic refrigeration (left 3).

Name: Pennco.

Purpose: To replace high-priority block-tin pipe in brewing industry.

Features: Made of extruded Tenite (a cellulose acetate butyrate), this transparent pipe allows the beer to be observed throughout its flow from barrel to faucet, so that any obstruction that might occur in the line may be located. Can be used in conjunction with all present standard beer connections and fittings and can be kept clean and sanitary by cleaning devices now in use. According to the distributor, beer conducted through this pipe loses none of the color, flavor and head that is brewed into it. Stocked in long-length coils and 12-ft. straight lengths. Diameters range from 3/16 in. o.d. to 1½ in. o.d. (Previous review of this material, FORUM, April, 1942, p. 46).

Distributor: North Penn Co., 72 Fifth Ave., New York, N. Y.

PLASTIC PIPE of resin-treated laminated paper.

Name: Fedralite.

Purpose: To replace steel casing where requirements are not so severe as to call for the ultimate in physical properties—now being used for oil prospecting, suggested for downspouts.

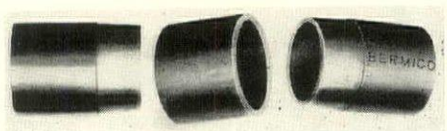
Features: The minimum "burst-point" of the tubing has been established as 200 p.s.i. Tubing failing at 400 p.s.i. has been produced by special methods. Currently being supplied for shot-hole casing in 10-ft. lengths with an outside diameter of 3 in. and with a wall thickness of ⅛ in., tubing of greater diameter can be produced by similar methods where the prospective volume is sufficient to justify the expense of molds. Available without priorities, strong, water-resistant, low in cost, light in weight, safe to handle, easy to retrieve for re-use.

Manufacturer: Gillette Fibre Co., 248 Boylston St., Boston, Mass.

FIBER CONDUIT made from noncritical materials.

Name: Bermico.

Purpose: For use as an inside drain pipe to carry off rain water; for installation of electrical cables; as a protective jacket to prolong the life of metal pipe exposed to corrosive action of liquids or gases; as a wartime alternate for specialized applications.



Features: Wood cellulose fibers are scientifically built up and heat-treated to form rugged tubes with a solid homogeneous wall structure. These tubes are then impregnated by a special process to produce a chemically inert, lightweight pipe with high mechanical strength and water resistance.

Manufacturer: Brown Co., 500 Fifth Ave., New York, N. Y.

(Continued on page 108)

Both are finding security in Copper and Brass

They're 10,000 miles apart, this young couple, but each, in his or her own way, is counting on copper and brass for security . . . she, on the copper plumbing and sheet metal work that will still be in good repair long after he returns . . . he, on brass ammunition, being supplied to him in sufficient quantities to insure victory over his axis adversary.

On the home front, much credit is due you for your pre-war specifying of copper and brass, for today these metals are relieving many American people from the annoyance and worry of rusting, irreplaceable equipment. And in the peacetime future, homeowners will count on your including copper and brass in specifications intended to provide lasting security and freedom from maintenance bills resulting from less durable materials.

ANACONDA
from mine to consumer

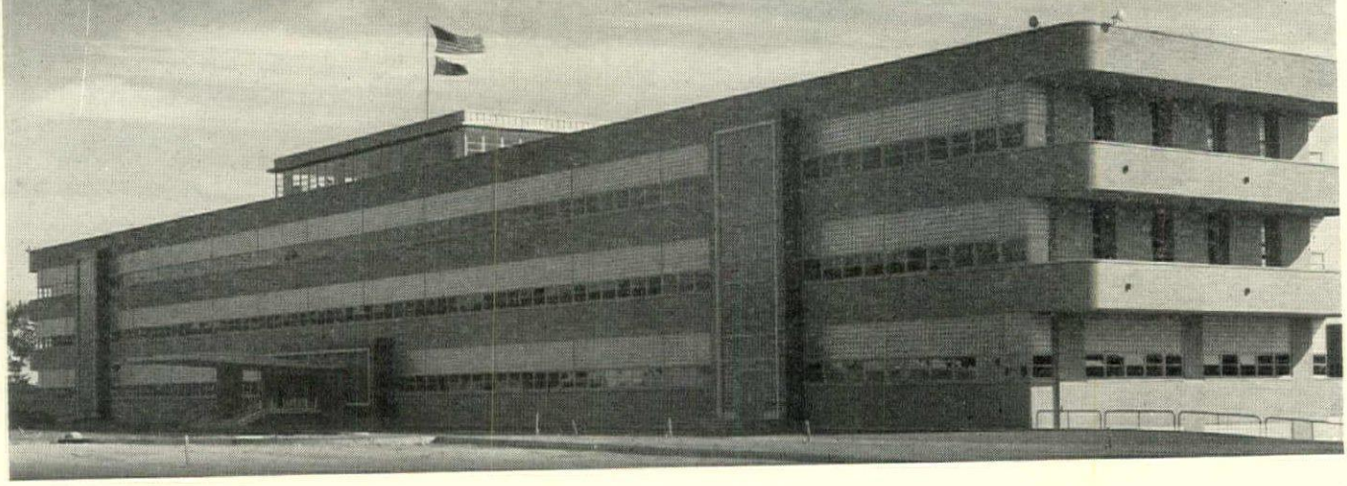
4319

Anaconda Copper & Brass

THE AMERICAN BRASS COMPANY—General Offices: Waterbury, Connecticut
Subsidiary of Anaconda Copper Mining Company • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

WAR PLANT BUILT WITH INSULUX GLASS BLOCK

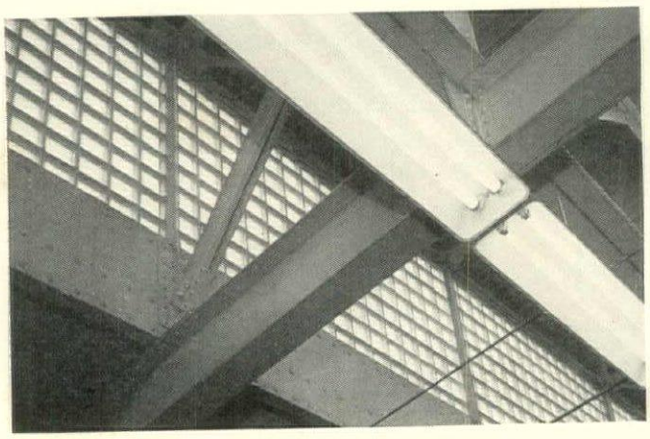
This plant—name, size and location restricted—was called by an architectural magazine "the last word in industrial building design and construction." In the administration building, shown below, and in production areas, INSULUX Glass Block were used extensively and effectively. We are proud to have supplied the glass block for this important war plant. INSULUX Products Division, Owens-Illinois Glass Company, Toledo.



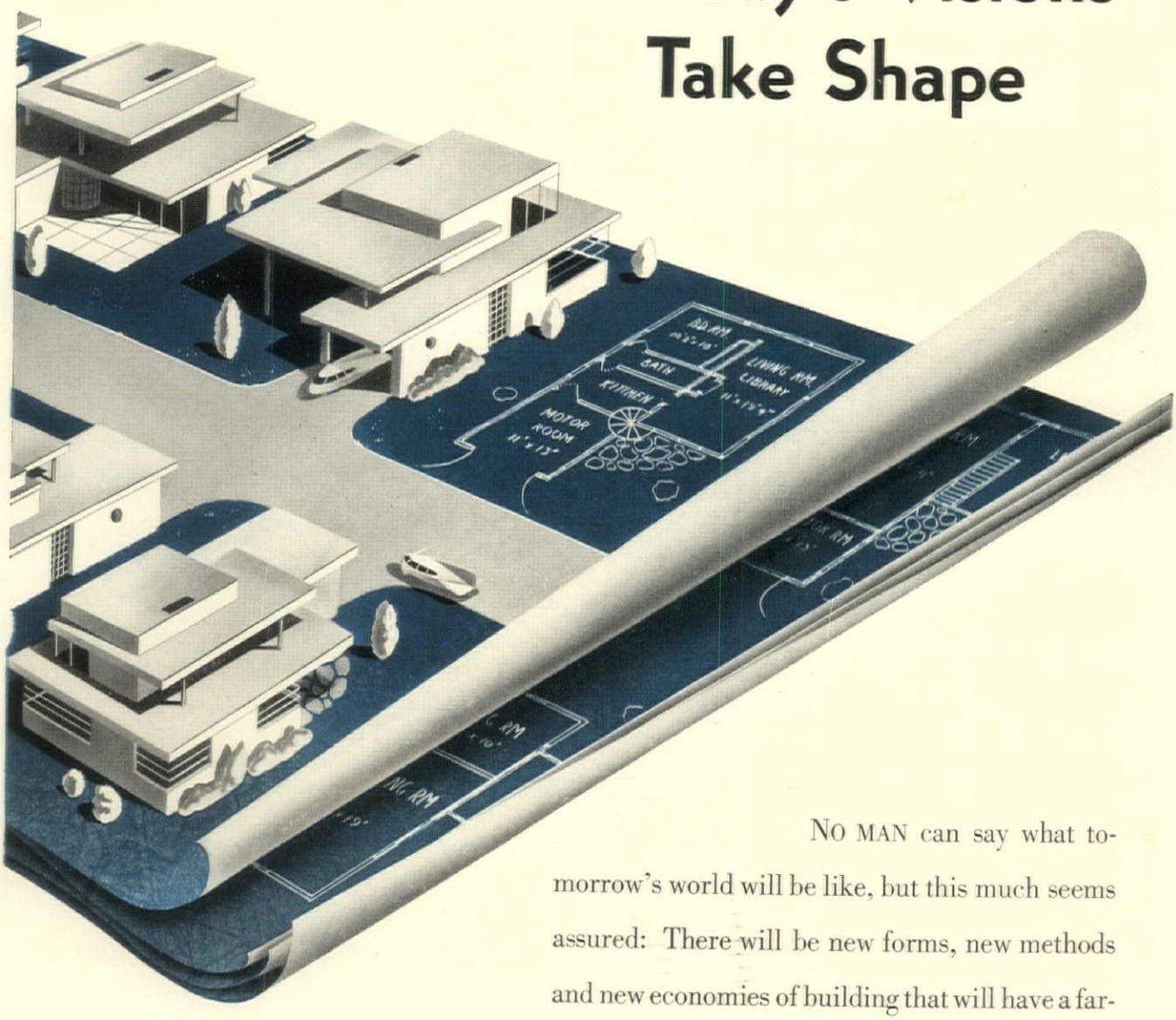
NEMBHARD N. CULIN, Designer
STONE & WEBSTER, INC., Engineers & Constructors

This INSULUX Glass Block monitor is typical of the system used for daylighting the manufacturing area, part of which is air-conditioned. Number of block used is restricted—but we can say that this is the largest glass block job ever built.

INSULUX prismatic block, used above clear-glass windows, provide evenly distributed lighting in this air-conditioned office, yet provide excellent insulation.



When Today's Visions Take Shape



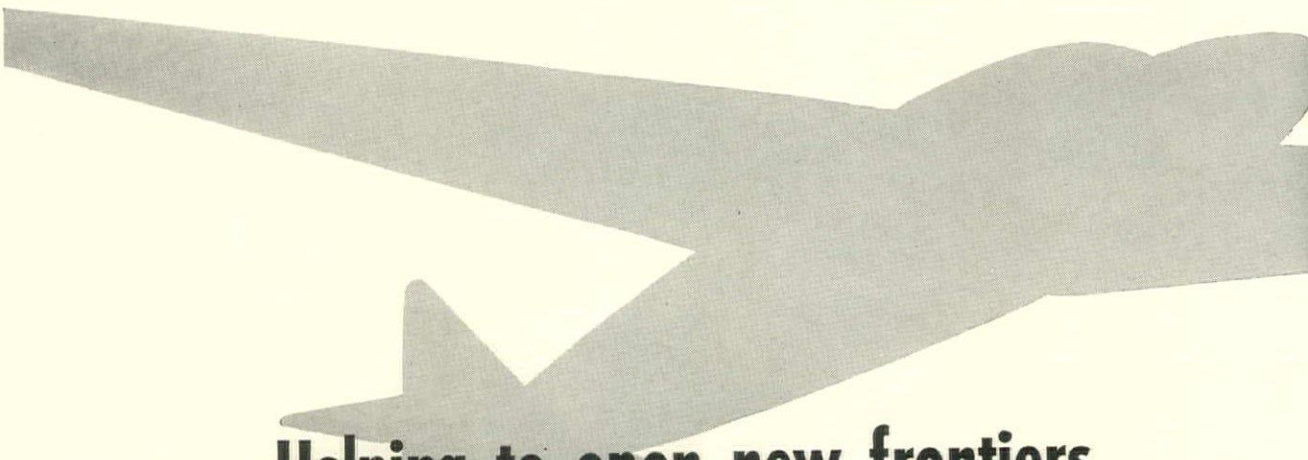
NO MAN can say what tomorrow's world will be like, but this much seems assured: There will be new forms, new methods and new economies of building that will have a far-reaching effect on the way of life in this country.

Today, Stran-Steel is doing things with steel that enlarge its scope and create new fields of usefulness. Traditional limitations of design have been overthrown, old practices revised, and a vast fund of engineering knowledge acquired as a reservoir for peacetime problems. Stran-Steel is a progressive organization, well qualified to serve the men whose visions will shape the future.

STRAN STEEL

DIVISION OF GREAT LAKES STEEL CORPORATION
1130 PENOBSCOT BUILDING, DETROIT, MICHIGAN

UNIT OF NATIONAL STEEL CORPORATION



Helping to open new frontiers

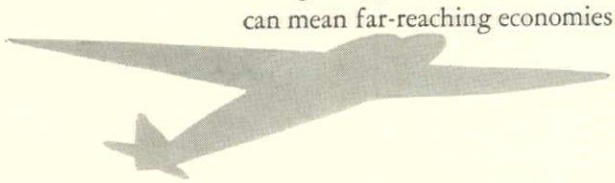
Many people believe that with safe, low-cost aircraft available in years ahead, home need no longer be located within a few miles of office or factory. No longer need busy men and women restrict themselves to only a single house, or confine their lives to one section of the country and one climate. For the airplane annihilates time as well as distance, makes both summer and winter homes entirely practical for millions of Americans.

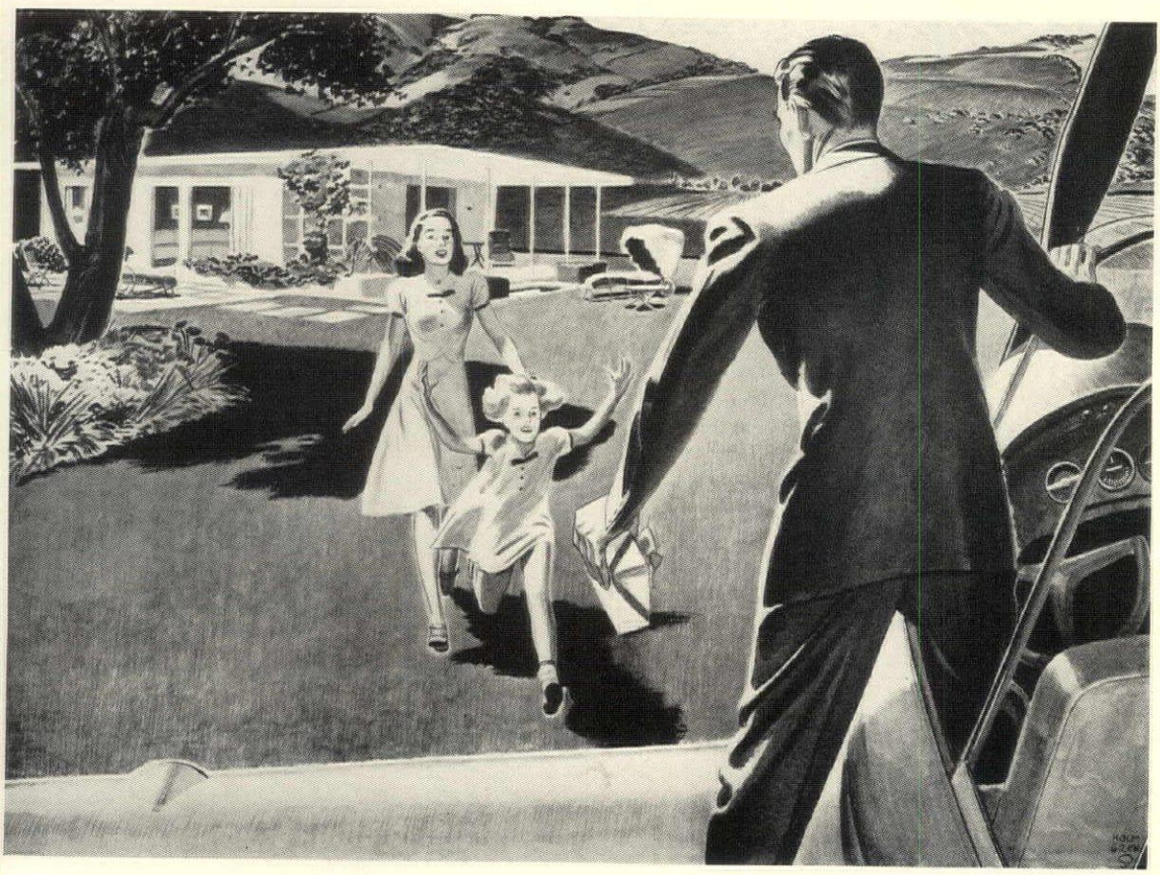
In the belief that public awareness of such prospects can widen the opportunities of the building industry, Revere presents the conception of Carl Boester, Director of Housing Research at Purdue University. By helping in this way to initiate public thinking about richer, more varied modes of living, Revere is confident that such advertising can benefit not only the architect, but the builder, dealer, realtor, manufacturer, and financier as well.

In presenting various conceptions of tomorrow's homes by leading architects and designers, Revere seeks only to stimulate public interest in better housing, confident in the knowledge that the greater use of copper and brass makes any house better to live in, better to own, better to rent or sell.

After the war, Revere roofing, flashing, pipe, tube and architectural shapes made of improved forms of copper and its alloys will help materialize these new frontiers.

And to serve you better, Revere has developed facilities for manufacturing the light metals, and is also pioneering with entirely new alloys that can mean far-reaching economies for you and the public alike.





Home . . . for a nation on wings

When an army of air-minded youth comes home from war, the aircraft industry will be ready with new designs of private planes for the millions who want wings. Time and distance will shrink to almost nothing. We will no longer be tied to congested communities where we work, but can live in dream places such as pine-wooded mountains, by rippling streams, on lakeside or seashore.

Far away from the smoke of cities, beyond water mains and power lines, homes will be needed that can provide every comfort and convenience without dependence on municipal pipes and wires. From the Department of Housing of the Purdue Research Foundation, Purdue University, have come amazing new conceptions for lower-cost homes, and entirely new principles that can double our living comfort and free us from most of the cares we know in running a home.

Here, for instance, is a house that gets its water supply from the air, its electricity from the wind for lighting, cooking, heating, cooling, its telephone service from visible radiophone, its protection against intruders from automatic electronic devices. It needs no paved road to the door, for you would shop, visit, travel to work and back in your safe and speedy "Cloudcar."

In joy of living, economy, comfort, beauty, repose, such houses could surpass any we have ever imagined. Modern research and mass production can easily make them available to a nation that already is growing wings.

CARL F. BOESTER

In this daring conception, Mr. Boester presents a picture surpassing any that former generations could have dreamed of. But great things are taking shape in the minds of engineers and in the research laboratories . . . remarkable wartime inventions and techniques that can bring us better homes for happier living after they have served their prime purpose in war.

Revere does not build houses or expect to in the future, but we at Revere know that, in tomorrow's homes, copper and copper alloys will play a greater part than before. Today copper furnishes protection against weather and termites, insures rust-free water, helps reduce heating cost. In time ahead it can bring us many further comforts and conveniences, can make our homes better to own, or rent, or sell.

All of us now are working for Uncle Sam. No copper is available except for war. But in Revere's laboratories, research is developing new types of metals and new uses that can open the door to better living for millions more in years to come.

★ ★ ★

In this limited space, Mr. Boester was able to give only the outlines of his conception. Revere has prepared a booklet containing more information. This, and former booklets on low-cost homes by other leading designers, will gladly be sent to you, free. Write to Revere.

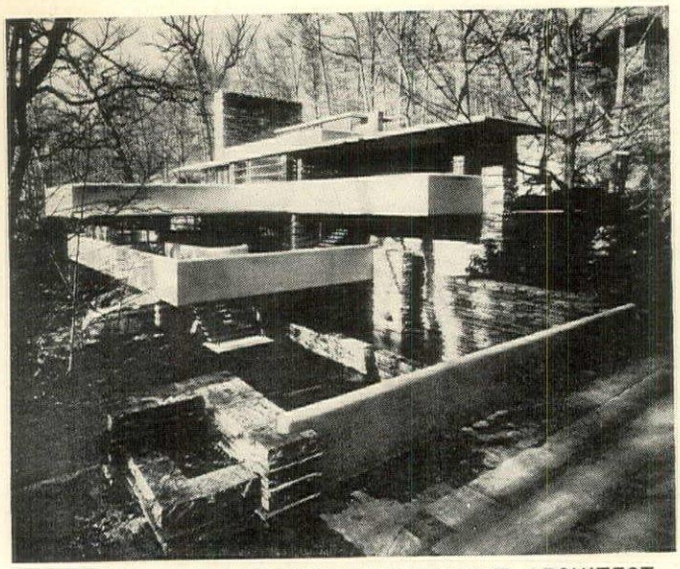
REVERE

COPPER AND BRASS INCORPORATED

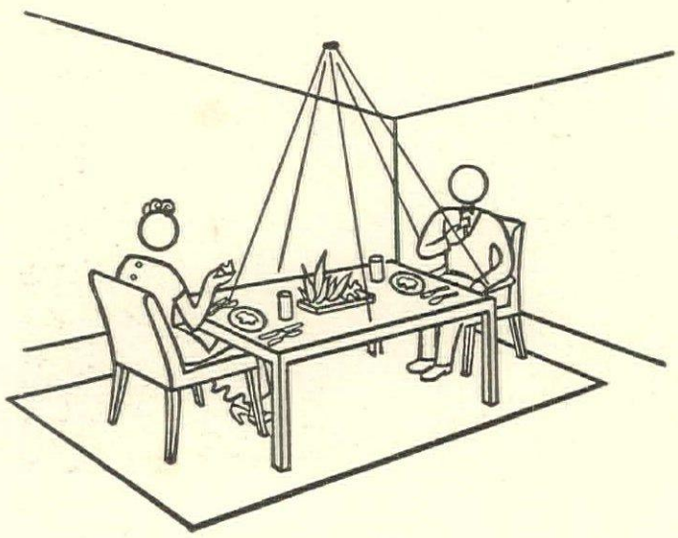
Founded by Paul Revere in 1801

Executive Offices: 230 Park Avenue, New York

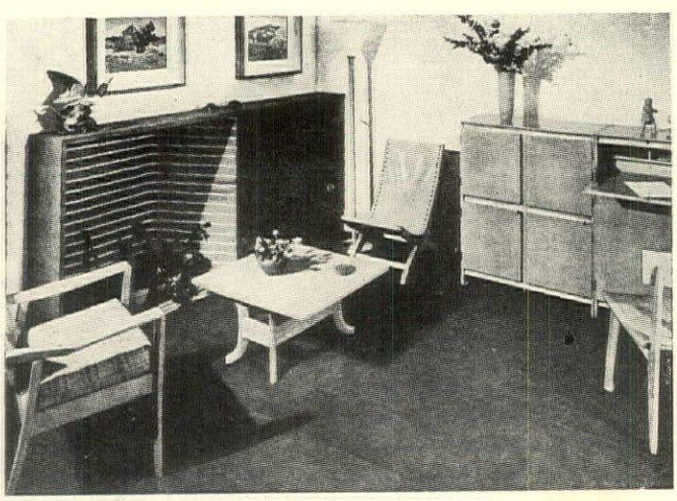
BOOKS



KAUFMANN HOUSE, FRANK LLOYD WRIGHT, ARCHITECT



SPOTLIGHTING FOR DINING TABLE



LIVING ROOM GROUP, BY RUSSEL WRIGHT

WHAT IS MODERN ARCHITECTURE? The Museum of Modern Art, New York. 36 pp., illustrated with plans and photographs. 7½ x 10. Paper covers. 75 cents.

This attractive booklet is the outgrowth of an exhibition of modern architecture prepared by the Museum of Modern Art, and it has been selected as the first of a series of elementary pamphlets on contemporary art. The ancient dictum of Vitruvius: "Architecture should meet three requirements—utility, strength and beauty" is taken as the theme of the book, with illustrations selected to show that modern buildings can meet these requirements in a completely satisfactory manner. Other characteristics of this type of design, such as absence of ornament, decorative use of new structural forms, use of abstract shapes and emphasis on asymmetry, are presented briefly and persuasively. The booklet also describes the change in the architect's approach from stylistic imitation to rigorous analysis of the problem. The second part contains typical examples of outstanding modern buildings. There is a house by Wright (illustrated), a school by Neutra, structures by TVA and the Farm Security Administration; also included are a few famous foreign buildings, such as the Bauhaus and the Swiss Dormitory in Paris by LeCorbusier. The booklet's clarity and excellent layout make it a very good introduction to the subject.

ALL ABOUT MODERN DECORATING, by Mary Davis Gillies. Harper & Brothers. 225 pp., illustrated with photographs and drawings. 8 x 11. $3.

There are already a number of books on modern home decorating, but this is the first popular guide of genuine value to the layman. Mary Davis Gillies, well known for her other writing on interior decoration, combines a thorough knowledge of her business with a sympathetic understanding of the problems (especially financial) of the family interested in making an attractive and livable home for itself. This book also shows evidence of excellent taste and an ability to write briefly and intelligibly. A major stumbling block in the way of the would-be modern home decorator is the lack of well-designed pieces at moderate prices. According to the author, "surveys indicate that borax modern accounts for more sales than all other forms of modern furniture put together." "Borax," from the design point of view, simply means junk. A great advantage of this book is that Mrs. Gillies has gone to the trouble to find out what well-designed furniture is available at a reasonable cost, to present some of it in illustrations, and to describe its general characteristics in the text. There is very useful information on construction, on solid woods versus veneers, on finishes, on care of furniture, etc. Throughout the book there is equally helpful information on every other phase of home decoration. Wherever this information can be given graphically, the author has used Madelaine Thatcher's excellent line drawings (see illustration). These drawings show not only furniture types, but principles of arrangement, simple methods of modernizing old rooms, the use of blinds and curtains, etc.

The book deals continually with personal problems of decoration, as a means of emphasizing the author's thesis that decoration is less a matter of style than the expression of people's tastes and ways of living. The result of this approach is excellent, for the reader is encouraged to adopt

(Continued on page 106)

three BIG ones *for the Navy*

Three of 500 giant laminated wood beams weighing 5000 lbs. each, built to Navy Specifications by Attwell Construction Co., Glue Fabricators, Seattle, Wash. Glued with CASCO Powdered Casein Glue.

WITH steel scarce and solid timbers in these dimensions unobtainable, CASCO and stock-size lumber do the job in a hurry.

Casein glue was used because working temperatures were low, around 40°F.—an example of production flexibility made possible through proper selection of the glue.

That's where we come in—supplying the right glue for the job *and for the production conditions*—whether it's casein, urea or phenol-resin glue.

Don't let the size of the job or near-freezing temperature stop you. Ask us how to go about it.

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Technical Service Dept. 350 Madison Ave., New York, N. Y. Manufacturers of **CASCO Powdered Casein Glues, CASCAMITE Urea-formaldehyde Resin Glues, CASCOPHEN Phenol-formaldehyde Resin Glues**—for plywood, laminated wood, joint or bag gluing

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A. I. A. Folder "Glued, Laminated Wood Beams, Arches, Roof Trusses"

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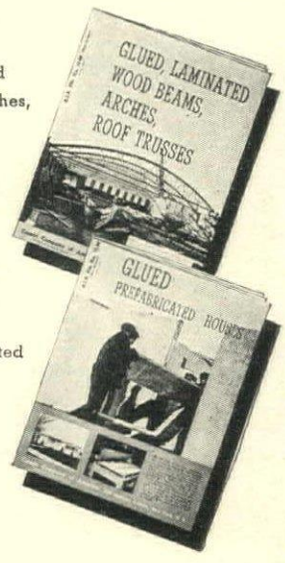


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DOOR CLOSERS

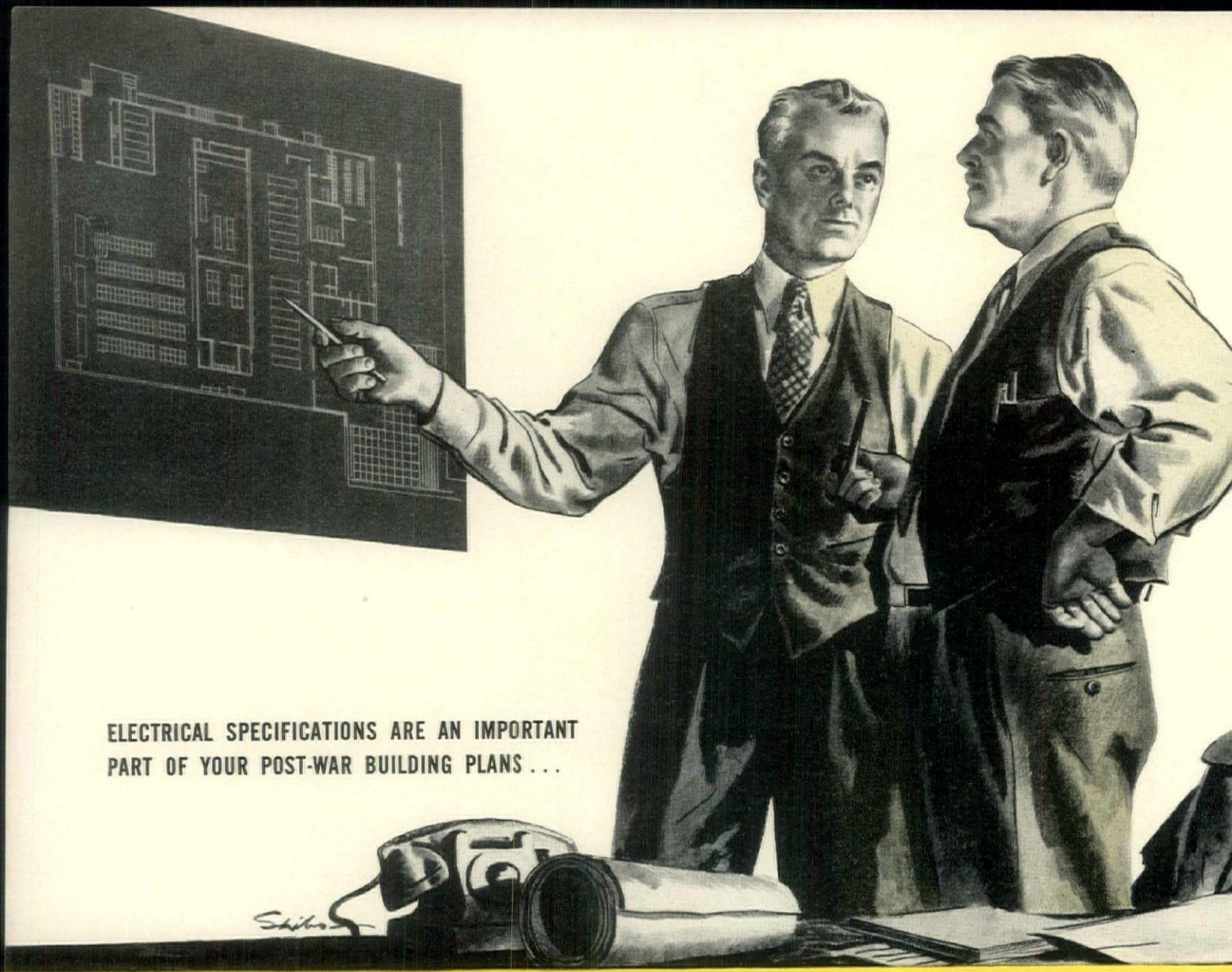
M-H *Miracles* WITH ELECTRONICS

ELECTRONICS bids fair to revolutionize our every day living after the war. When Minneapolis-Honeywell placed its fifty year experience and manufacturing resources at the call of our government, the results of several years of research in electronics were immediately applied to controls and devices for war . . . Extending this peacetime experience to the techniques of war will bear fruit, when Peace comes, in startling new developments in the electronic control of automatic heating and manufacturing processes. Minneapolis-Honeywell Regulator Co., 2740 Fourth Ave. S., Minneapolis, Minn. In Canada: Toronto, Ontario. In Europe: London, England, and Stockholm, Sweden.

Listen: "JOHN FREEDOM" ★ Blue Network Coast to Coast every Wednesday, 9:00 to 9:30 P. M., E. W. T.; or see your local newspaper ★ "The Most Dramatic Show on the Air"

Instruments by **BROWN** *and Controls by*

MINNEAPOLIS-HONEYWELL



ELECTRICAL SPECIFICATIONS ARE AN IMPORTANT PART OF YOUR POST-WAR BUILDING PLANS . . .

Now is the time to call in a Square D Field Engineer

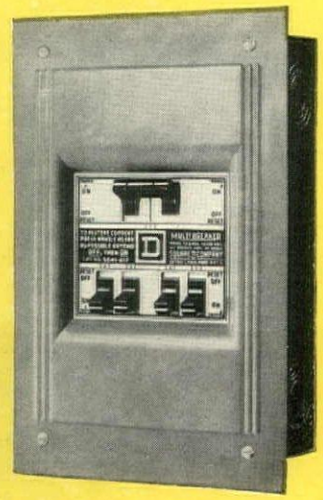
Right now, when your plans for after-victory building are in the very early stages of development, is the time to make sure that the right electrical specifications are included. There are several factors involved in arriving at the answer. Adequate wiring, of course, is basic. Beyond that are the factors of flexibility, convenience and protection. With industrial conversion, multiple housing and prefabrication very much in the picture, the cost factor is going to be important, too.

You'll find the Square D Field Engineer, through constant contact with industrials, builders and electrical contractors, a source of sound counsel in providing for the right electrical specifications for tomorrow.

There are Field Engineers ready for your call through Square D branch offices in 52 principal United States and Canadian cities.

★ ★ ★

for tomorrow's homes—SQUARE D MULTI-BREAKER



Currently, every Multi-breaker we produce is assigned to wartime service. But the same features which make it so valuable to the war effort, earn it a place in the homes which will be built in the future.

The Multi-breaker eliminates fuses completely. When a short circuit or dangerous overload occurs, the circuit is cut off automatically. A simple movement of the shock-proof lever restores current. There are no delays—nothing to replace. Yet the Multi-breaker costs little, if any, more than fusible equipment —often actually less.

SQUARE D COMPANY

DETROIT - MILWAUKEE - LOS ANGELES

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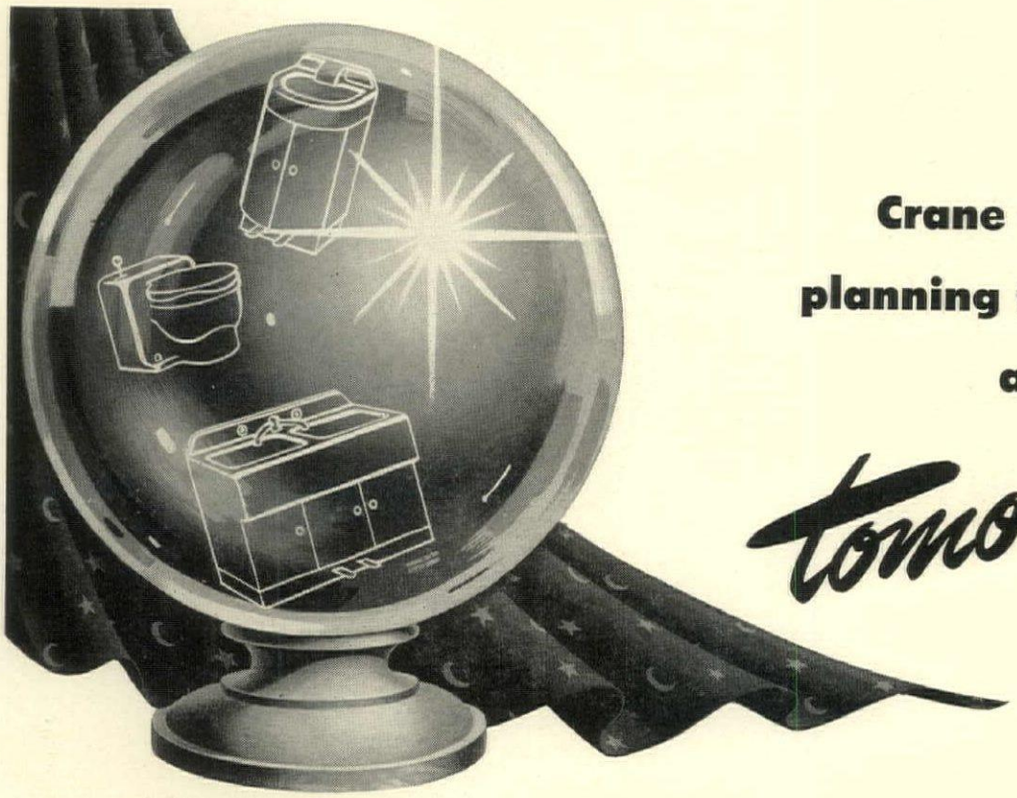


Crane designers are planning the bathroom and kitchen of *tomorrow*

WHAT will the bathroom and kitchen of tomorrow be like? Already on the drawing boards of Crane designers are new ideas—startlingly different ideas that promise new beauty—new comfort and new economy for tomorrow's homes.

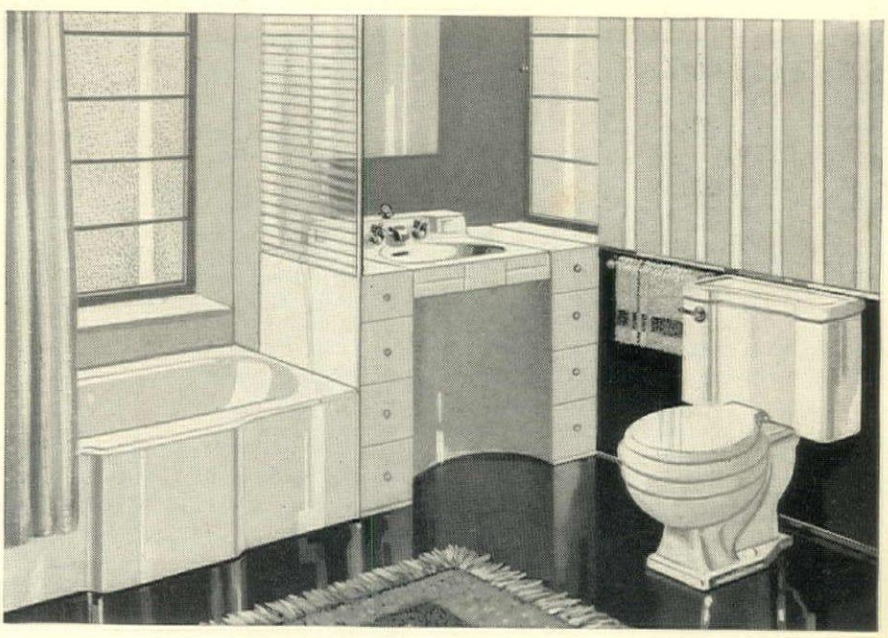
Even now plans are being made to submit these ideas to architects, builders and home owners. The Crane line of the future will be designed to reflect the wishes of those who are planning homes and those who will own the new homes of postwar America.

And when V-Day comes and prospective home owners say "Go Ahead," the Crane line promises the architect a new conception of beauty and efficiency in the bathroom and kitchen.

The Drexel bathroom group shown at right may contain the fixtures many of tomorrow's home owners prefer, and, if it does, it will be included in the Crane line.

But the introduction of new materials—the development of the new ideas on which Crane designers are now at work—may mean a bathroom and kitchen of the future radically different from the bathroom and kitchen of the past.

Whatever fixtures are included in Crane's postwar line, they will embody the years of experience—the technical skill of Crane designers and engineers—the same regard for beauty and style, as well as sanitation, that have always characterized Crane quality equipment.



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LETTERS

MOTION PICTURE RELIEF FUND

Forum:

. . . The entire layout (Nov., p. 37) was magnificently conceived and projected, and I feel sure did complete justice to the wonderful job accomplished by our Architect, Mr. William Pereira, who gave so unselfishly of his talent and time to make the undertaking the success it has turned out to be. . . .

RALPH MORGAN

Beverly Hills, Calif.

A good cause, a good client, a good architect and a superb result.—Ed.

OUT OF THEIR SEATS

Forum:

The major thesis of the Article on Integration (ARCH. FORUM, Oct. '42) is logical and timely. Building has suffered by failure to parallel modern industrial production methods. Industry has resolved the processes of manufacture into a multitude of specialty steps. This Building has also done. But effective Industry has been working toward smooth coordination of these steps. This Building has failed to do. Many planners, including some which the article scorns as the "cloistered" variety, have realized this more than most of the "practical" operators including builders, financiers and labor leaders who have a money stake in Building.

The marketing of prefabricated houses is the easiest means of putting Building on a modern industrial basis. However, the speed with which prefabrication will replace traditional methods of construction is doubtful. Certainly the factor of *liquidation* mentioned will be a slow one to set in operation for existing durable types of structure. That will retard the scope of prefabrication as will the continued demand for durable homes of the conservative type. Liquidation by redevelopment through condemnation may be augmented by some application of the present auto and radio trade-in process.

For buildings of limited prefabrication it seems as though the large-scale developer will tend to squeeze out the small builder. Mass buying not only of materials but also of talents should make possible well designed and inexpensive buildings. The undertaking of financing by construction firms in the manner of the motor car companies will give these great development corporations further advantage.

For even a measure of survival of Little Business in Building there must be greatly increased efficiency by small operators. Design and construction must attempt to compete with that of the big operator. This demands a teamlike and continuing association of constructor, architect, engineer—not the casual, sporadic and often antagonistic relationship customary in the past. Government war projects have helped develop this idea of professional teams. Moreover, planners and designers should participate in the actual building. To keep their activities on a professional basis the financing of building in which they participate should be reorganized to prevent them from any speculation or profit sharing other than professional compensation for services.

The term "integrated" Building Industry is understandable but just what would be meant by an "integrated Building Profession" is hard to realize. Automotive and aviation industries are well organized, but we know of no automobile profession or airplane profession. The fields are so big that there are many professions, not just specialties of professions, involved.

The war has blasted established conditions in Building as elsewhere. It has exploded groups from seats in which they had long been snugly, if not always too comfortably, settled. THE FORUM can perform a real service by developing means of keeping the same groups from settling back into the same positions after the war. It is to be hoped that THE FORUM will go beyond pointing out war-changed situations and even beyond the indication of the need of an integrated Building Industry. It should show how this integration might be achieved and, since integration cannot be suddenly achieved, it should show the stages of this achievement.

ALBERT CHARLES SCHWEIZER

Washington, D. C.

Ex- N. Y. U. Professor of Architecture Schweizer, like the good pedagogue he is, has anticipated FORUM editors who intend to explore further the technique of Building Industry integration in forthcoming issues. If industry integration moves faster than THE FORUM, more power to it.—Ed.

POSTWAR PLANS

Forum:

. . . We in Cape Town have been finding your recent numbers of THE FORUM, dealing with Defense Housing, of absorbing interest, particularly the manner in which this housing is being dovetailed into the permanent housing pattern in an attempt to meet your postwar housing problems. This housing is, however, part of a larger problem of preparing larger-scale town and regional planning schemes, and it would be of great interest if you could give some news of specific town and regional planning developments in the U. S. A. There have of course been references to various planning research boards and the articles on the Postwar Pattern—for the moment shelved—were very fine.

I should be most grateful if either in THE FORUM or privately you could give a short report on the town-planning activities and researches being carried out by Government departments and professional bodies. Statutory regional planning schemes must, I believe, follow this war, but your recent reference to the scrapping of the New York Regional plans shows the stiff opposition which will be met. I have not seen a reference to an American equivalent of the British Town Planning Institute which is a professional body with entry by examination. Does such an Institute exist?

D. R. HARPER

Mowbray, Cape Town, South Africa.

Numerous state and civic bodies are discussing postwar projects (FORUM, Nov., p. 72). Lack of progress beyond ideas is due to lack of funds. New York State and City, and a few others, are shining exceptions. . . . The American Institute of Planners is the BTPI's equivalent. Headquarters: Chicago, Ill., objective: to study and advance the science and art of city, town, county, state and national planning. Membership (now 177) is limited to the profession.—Ed.

Forum:

. . . Referring to your article in the November FORUM on Postwar Planning, here in Massachusetts we have two groups working on postwar construction: first, a State group to propose State projects, and second, a postwar readjustment committee which is studying the problems of what industries are best adapted to Massachusetts, and to what skills our workers are best suited.

In other words I believe, and I assume you do, that the future of our country depends ultimately upon private industry, adapted to the various regions of the country, sustaining the future of our system of living. Until the retooling process can be accomplished, and while there are necessary public works to be carried out, the Government must assume a portion of the employment problem. . .

LEVERETT SALTONSTALL, GOVERNOR

Boston, Mass.

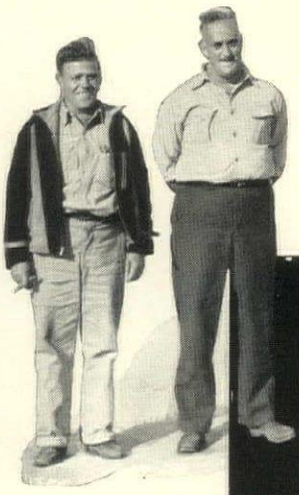
Forum:

. . . At the time when I first answered your query the chances of accomplishing anything constructive for Postwar Planning were rather remote, but amazing developments have resulted during the past year from efforts put forth by several representatives of the National Resources Planning Board. These agile and qualified

(Continued on page 98)

Coast to coast, they're saying . . .

"Dry-built, full wall construction with Strong-Bilt Panels speeded the job . . . cut costs"



Left to right: Thomas Tufaro, superintendent; H. B. Alston, vice president, Bush Construction Company, New York.

CASE HISTORY No. 20: 500 demountable houses erected in Connecticut by Bush Construction Company of New York. Interior walls of Strong-Bilt Panels precut to full wall size at the factory and shipped to the site for application to conventional stud construction. Precut ceiling sizes applied to prefabricated ceiling sections by jig assembly.

Upson Engineers, experienced in new mass production speed and economy methods will gladly explain adaptations to your plans and system. Phone, wire or write, The Upson Company, Lockport, N. Y.

Upson Quality Products Are Easily Identified By The Famous Blue-Center

BUSH CONSTRUCTION CO., Inc.
(DIVISION OF CLINTON G. BUSH COMPANY)
EXECUTIVE OFFICES
370 LEXINGTON AVENUE
NEW YORK CITY

GENERAL CONTRACTORS & ENGINEERS

MURRAY HILL 3 {0730 0731 0732 0733

December 3, 1942

The Upson Company,
Lockport, N.Y.

In re: Project Conn. 6018
500 Prefab. houses
Conn.

Att: Mr. H. R. Shedd,
Vice-Presicent.

Dear Mr. Shedd:

We wanted to let you know how pleased we are with the Upson Syntho-Coated Strong Bilt Panels.

We used these in 500 houses on this project and the cut-to-size panel presents considerable advantage.

For your information, our type of construction made it possible for us to apply your pre-cut panel at our jig operation insofar as our ceilings are concerned. The application of the side walls in the field was handled with good dispatch and extremely low labor cost. Personally, I was very pleased with the pre-coated Upson panel, and should the opportunity present itself, I assure you we will be more than glad to give your product favorable consideration.

Your complete drawings and field service were of inestimable value to us and affected greatly the speeding up of our operation.

Kindest personal regards.

Very truly yours,
BUSH CONSTRUCTION CO. INC.
Hal B. Alston,
Vice-President.

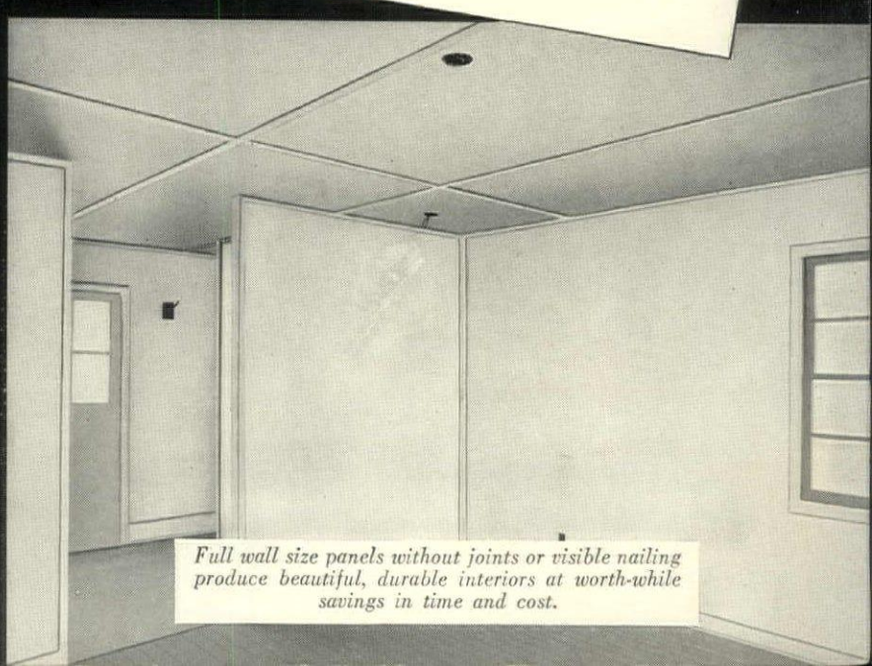
HBA/LP

No cutting, taping or filling of joints. No nails to countersink. Special Upson Fasteners grip panel securely from rear.

THE *Crackproof* BEAUTY SURFACE FOR WALLS AND CEILINGS

UPSON PRODUCTS

UPSON
STRONG-BILT
PANELS



Full wall size panels without joints or visible nailing produce beautiful, durable interiors at worth-while savings in time and cost.

LIVING PICTURES . . . .

. . . . . with ANDERSEN

COMPLETE WOOD WINDOW UNITS

The beauty of the outdoors brought to the comfort of the indoors . . . wall areas that live . . . that change with the seasons . . . windows in eye-catching groups that lend distinction to design and personality to appearance—it all means more fenestration for the 194X Home.

And as window areas increase, so it becomes increasingly important to fill those areas with window units that have been designed as a lifetime functional part of the entire structure. For years Andersen has produced and promoted Lifetime Window Units of sound modern design and wide adaptability to all types of architecture.

In 194X Andersen will still be solving problems in modern fenestration with Andersen Lifetime Wood Window Units. Sold through regular millwork channels. See Sweet's Catalog, or write to address below for complete details.

In the picture . . . an interesting installation of Andersen Horizontal Gliding Windows in a home of moderate cost.

Andersen Corporation

BAYPORT, MINNESOTA

ONLY THE RICH CAN . . .


. . for the 194X HOME
AFFORD POOR WINDOWS

Chicago's Municipal Park Building was completed in 1939. More than a mile of air-ducts were installed where repairs or replacements would have been costly. Therefore ARMCO *Ingot Iron, famous for its long, trouble-free service, was specified.*

They looked ahead in 1939

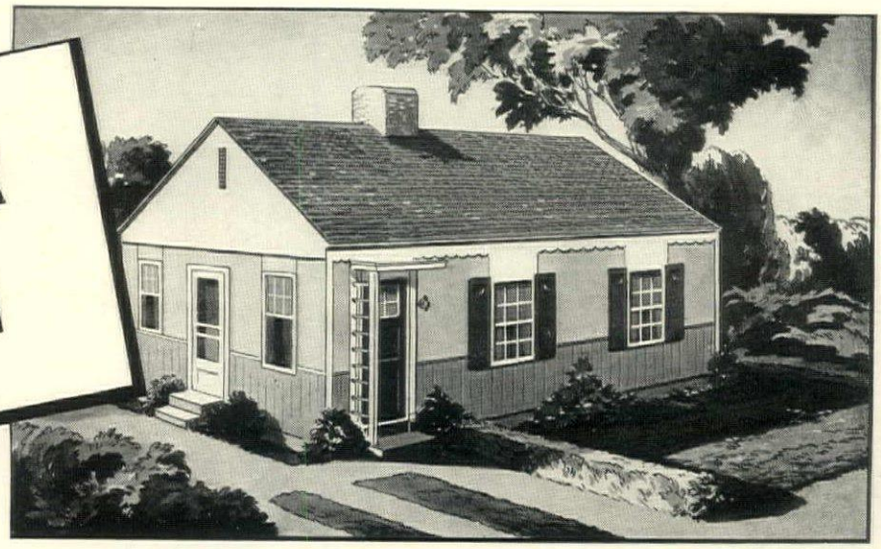
• Replacements for most ductwork systems are impossible to obtain. So the foresight of architects and engineers who have specified ARMCO Ingot Iron in the past is appreciated by their clients. This durable metal has the longest record of actual service of any low-cost iron or steel sheet. Ductwork installations made in 1914 are in good condition today.

• ARMCO Sheet Metals have gone to war, yet out of this "flaming crucible" will come many improvements and new developments you will want to know about. When it's all over, remember that ARMCO will be a good source for up-to-date information on sheet metals for all kinds of building applications. The American Rolling Mill Company, 241 Curtis St., Middletown, Ohio.

THE AMERICAN ROLLING MILL COMPANY

SPECIAL PURPOSE ★ ARMCO ★ SHEET METALS

POST-WAR HOUSING



THE $1800 HOUSE

No longer a dream, but a practical possibility is a completely-equipped, architect-designed, two-bedroom home that will sell—at peacetime price levels—for $1800.

This will *not* be a standardized box that rolls off the assembly line of some central prefabricating plant—to be shipped a thousand miles away to the site. The $1800 house will be produced *locally* to meet the needs of the *local* market . . . most of the economies that permit so low a price stem from *decentralization* of prefabricating technique. Decentralized prefabrication retains all the advantages of plant production methods, but at the same time reduces transportation costs.

Decentralization is a basic principle of engineered housing. Engineered housing enables the architect to design better homes that cost less to buy and less to operate. With engineered housing, the architect's creative knowledge of the needs and tastes of his own community is translated into machine-perfect shelter.

Engineered housing

For seven years (and at a research outlay of several hundred thousands of dollars), Homasote Company has been studying the application of sound engineering principles to the problem of building a home. Homasote's purpose: to help the architect who specifies Homasote Building and Insulating Board (as well as the builder who uses it and the dealer who distributes it) sell more and better houses.

Result of this exhaustive research is the Homasote Precision-Built Method of Construction—a system which:

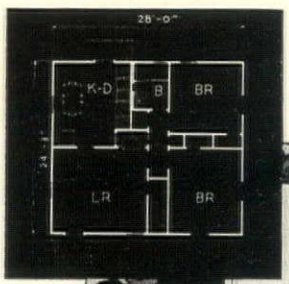
(1) enables the architect to incorporate all the engineering economies of prefabrication into the homes he designs.

(2) is based on the use of Homasote Board and other *standard* quality materials readily available in the local area.

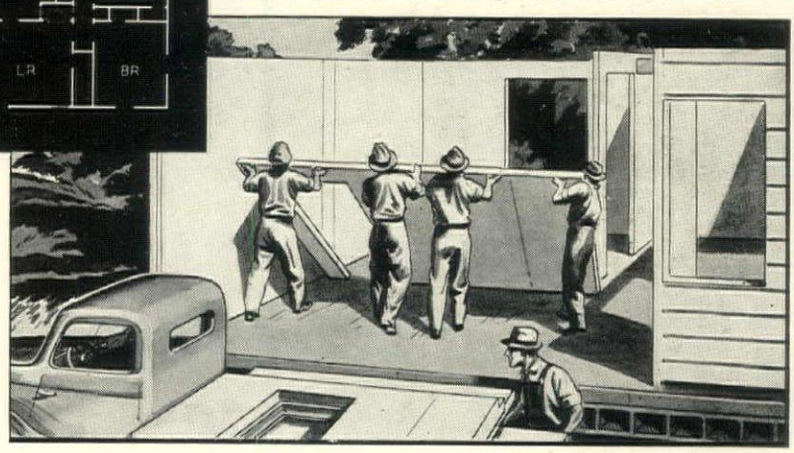
(3) protects the architect's reputation by insuring his designs against identification with jerry-building.

(4) saves the architect's detailing time—thereby increasing his productivity—by providing complete charts and reference tables.

(5) permits *complete* design freedom (any architect's design can be adapted to Homasote Precision-Built Construction with no change in a single overall dimension greater than two inches.)



PICTURED AT TOP. Low-cost Homasote Home constructed on the Precision-Built Jr. Method . . . LEFT. Basic floor plan of low-cost, two-bedroom home . . . BELOW. Crew assembling walls and partitions at the site.

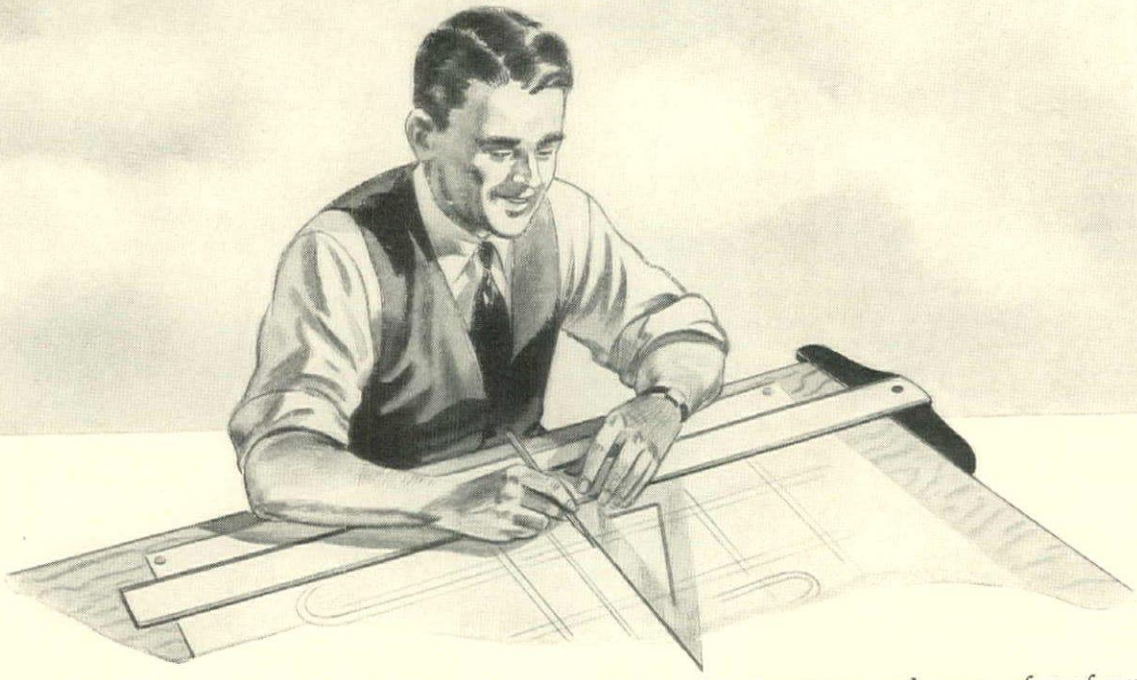


The soundness of Homasote Precision-Built Construction has been proved in $6,000,000 worth of private homes erected in every part of the country and $24,000,000 worth of government housing—all architect-designed. After the present emergency, Homasote Precision-Built Construction will open up new markets for architects: low-cost housing for the millions of Americans who have never been able to afford homes of their own before; large realty developments; better homes in all price classes.

For more details, write HOMASOTE COMPANY, Trenton, New Jersey

HOMASOTE *Precision-Built* **HOMES**

There'll be a larger place for steel in buildings of the future!



Take the brakes off your imagination. Dream of buildings in a more attractive, a more comfortable, a more efficient world of tomorrow.

When you've finished dreaming—*then come back to earth.* It's time to select the materials from which you will build your structures.

You'll find a multitude from which to choose—and you'll specify and use many of them, each to do the job for which it is best fitted.

Among them is STEEL—offering a combination of qualities found in no other material. Steel *always* has been dependable—will be even more so in the future.

Steel is strong, tough, and safe . . . high in strength to weight ratio among building materials . . . fireproof and verminproof . . . extremely versatile . . . inherently long in life . . . easily workable . . . and low in cost, considering its advantages and years of performance.

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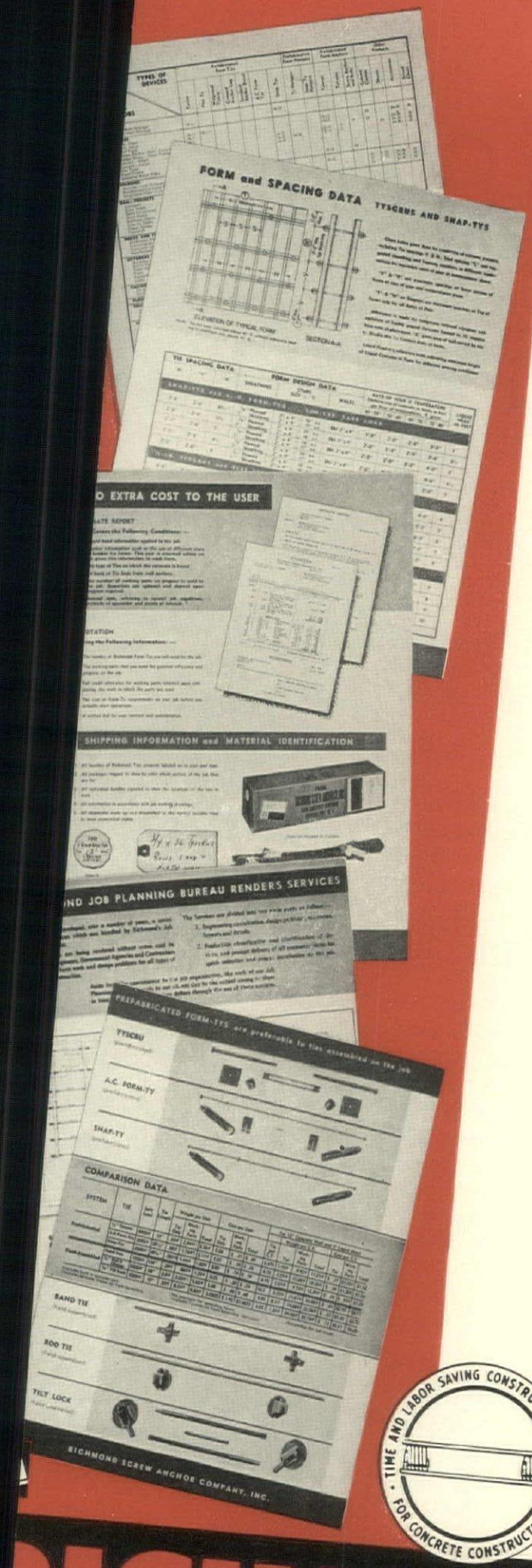

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1. PROBLEMS. Better postwar *window* designs (a) for hospital buildings, and (b) for small houses.

2. CASH AWARDS

	Hospital Window	Small House Window
First Prize.....	$ 500.00	$ 500.00
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Four Mentions, $50.00 ea.	200.00	200.00
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3. PROFESSIONAL ADVISER. C. William Palmer, A. I. A., President, Michigan Society of Architects.

4. JUDGES. The judges (registered architects) for the Jury of Awards, selected from localities near Detroit, to conserve transportation facilities, are:

Edward G. Conrad, Cleveland
Robert B. Frantz, Frantz & Spence, Saginaw
Branson V. Gamber, Derrick & Gamber, Detroit
John N. Richards, Mills, Rhines, Bellman & Nordhoff, Toledo
Amedeo Leone, Smith, Hinchman & Grylls, Detroit
Alfred Shaw, Shaw, Naess & Murphy, Chicago
R. W. Weed, Eastern Sales Manager, Detroit Steel Products Company, will be the seventh judge, representing the sponsor.

5. SANCTION BY THE A. I. A. The Committee on Competitions of the American Institute of Architects has approved this program.

6. COMPETITION DATES. Competitions will start at 8 A. M., Monday, February 1st, 1943, and close at 5 P. M., Friday, March 26th, 1943.

SEND FOR DETAILS TODAY

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Professional Adviser, Fenestra Architectural Competitions,
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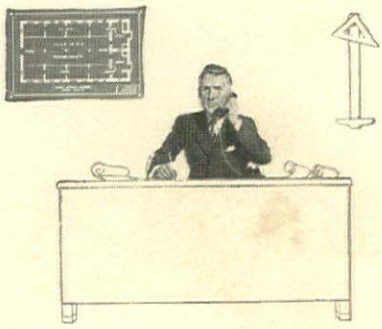
The Paintriotic Architect...



1 "Yes Jim, it's quite a job . . . keeping all these wooden buildings from going to pieces. Nobody knows when they can be replaced, so it's up to us architects to help see that they're protected from the weather. And believe me, fellow, that calls for really *good* paint . . ."

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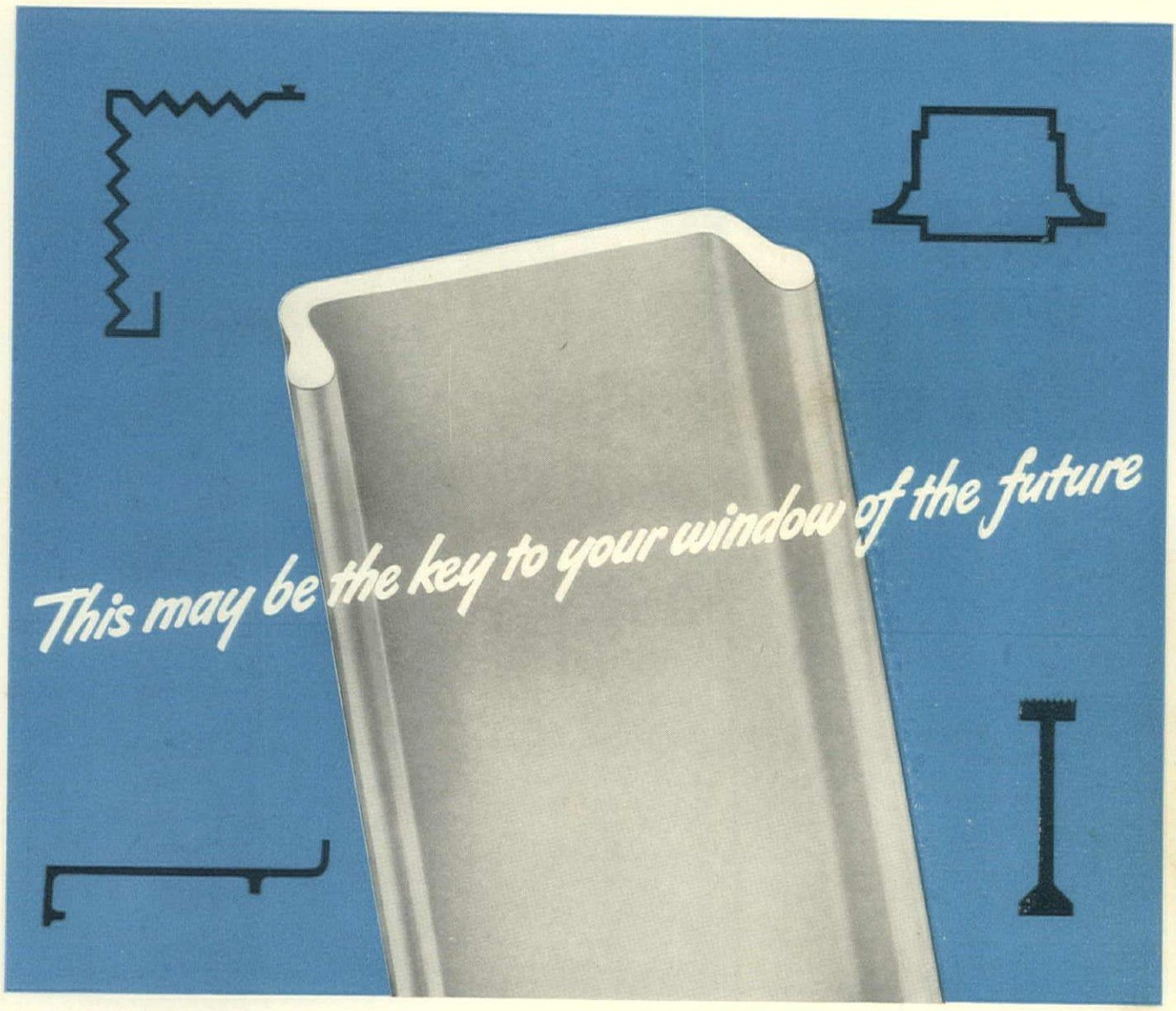

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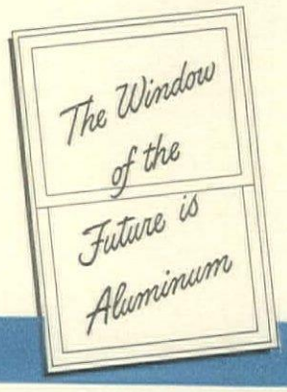

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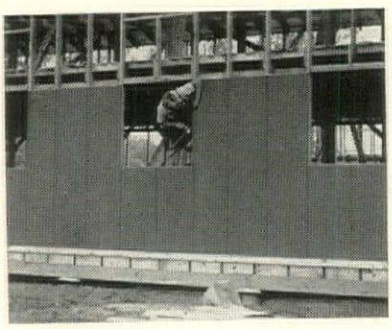

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THE MONTH IN BUILDING . . NEWS

Housing appropriations face new congress (this page) . . . President's budget slashes FHA, FHLBA's allotments (this page) . . . Snags in Homes Use Service as Frank Bane resigns (this page) . . . Shipbuilder Kaiser turns home building Mohamet (page 34) . . . Titles I, VI due to be renewed (page 34) . . . Rolph Nugent's installment buying plan for postwar delivery (page 35) . . . Beiter, Taft present postwar plans to Congress (page 35) . . . Businessmen set up CED (page 35) . . . Colean speech depresses Mortgage Bankers (pages 94-5).

THRIFTY NEW YEAR

As the 78th Congress opened in a critical and challenging mood, several matters were uppermost in the minds of Building men. First, of course, was the now-accepted fact that this year's building dollars were certain to crash down from the record-breaking total of 1942. But even if the cut reached 40 per cent the 7 odd billions remaining were far from hay. Second was the fate of the Lanham appropriation now practically exhausted. What remains is completely earmarked—due to the long delay in passing the amendment to the bill last fall. At that time there was a large backlog of projects waiting to be financed when finally the money came through.

Third question was: "How much more will Blandford request?" Best conjectures —somewhere between $300-500 millions. Administrator Blandford, it is said, will not appear before the Congressional Committee until he has thoroughly sifted all possible challenges, and until his charts, graphs and facts are complete—probably by mid-February.

Delay is inevitable, due to the complicated maze through which the request must pass. First, an extension of the program has to be introduced and passed on by the Public Buildings and Grounds Committee. Then the Appropriations Committee has to make the funds available. The outright appropriation is usually tacked on to one of the War Appropriations bills and, like any other bill, has to run its course through Congress. If it sees fit, the Appropriations Committee or either body of Congress may cut (or increase) the amount specified.

Beyond monetary problems is the pressing need for materials. WPB says it will provide materials to complete 294 thousand private and public dwellings now under construction, plus enough to start 340,000 additional dwellings. Token of its good faith but no guarantee of future behavior is that the Requirements Committee has granted NHA enough steel to complete its full program for the first quarter of 1943.

Building in the Budget: Recommended by President Roosevelt in his January 11 Budget message were slashes for FHA and the Federal Home Loan Bank Administration—FHA would be allotted $10,285,560 (last year it received $14,621,499) and FHLBA would get $12,322,250 as compared with last year's $15,275,000. These sums are for administrative expenses only —payment of salaries and other operating activities.

FHA cut is due to the assumption that the Agency will not do as much business this year, and that Title I is due to expire (the budget cannot anticipate renewal action on the Title, see p. 34). FHLBA was cut with the excuse that HOLC eats up most of the operating funds, is gradually liquidating and will not require as much money.

NHA (for salaries and other operating expenses) will receive $529,953. Classifying NHA's functions as 1) formulation of "a truly national housing policy" and the coordination of constituent agencies and 2) programming of war housing construction, the Budget specifies money for only the first of these categories. Future Lanham Act appropriations will provide allotments for the second.

Kahler resignation: Item in the month's news was the resignation of William V. Kahler after 2½ years as director of WPB's Construction Bureau. Ostensible reason: a desire to return to his old job with the Illinois Bell Telephone Company. Unofficial reaction is that most of his Bureau's powers have been inherited by the Facilities Bureau.

Bane resignation: More significant was the resignation of Frank Bane as director of the Homes Use Service. Temporarily in Bane's spot is Philip Klutznick, regional NHA director for Chicago. But no amount of personnel juggling could disguise the structural faults of HUS.

►Most basic was that the lawyers decided to strain a few points and use Lanham Act money. Their motives were worthy—they did not want to take all the time necessary to wangle a separate appropriation from Congress. But to comply with the Lanham Act requirements they had to go through the rigamarole of having the Government lease the entire house to be converted and figure out a fictitious gross

(Continued on page 34)

rent and net rent, the difference between the two representing in theory the cost of conversion work. (The legal boys had declared Lanham Act funds could not be spent directly to improve private property.) As a result of all this, the lease form became immensely complicated.

►Second was the failure to offer real estate men an inducement to scout around for conversion projects.

►Third was the failure to provide for temporary and partial conversions.

HUS was looking on the wrong side of the tracks for houses, was confining itself to rooming-house districts where the houses were too poor for conversion. In sections of the city with the most available space property owners were not interested because they did not wish to have their homes converted permanently to rooming houses. Also, zoning officials were reluctant to allow a permanent letting down of bars in the better sections. Temporary conversion would have eliminated these difficulties, helped to conserve materials.

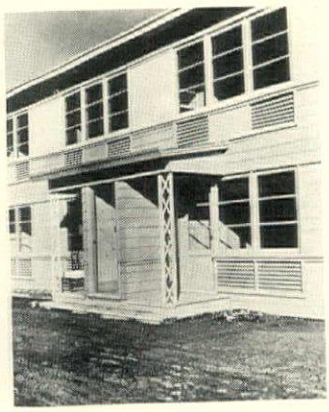
►Fourth was the failure to work up effective publicity campaigns appealing to patriotic property owners to make their houses available.

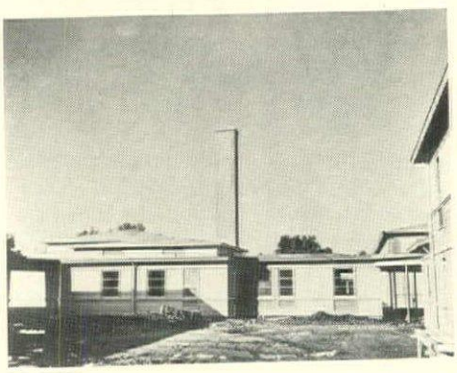
The new approach: Under a new set of orders, HUS will be HOLC's responsibility. HOLC will have charge of all conversion, will utilize its years of experience in sprucing up houses it had to take back, will screen all applications. Real estate agents will now be paid a finders fee for turning up likely projects, will receive another fee if the project goes through.

Provision is now being made for temporary conversion, although progress is slow. Blandford's experts have not yet worked out an unequivocal guarantee that the property will be restored to its original shape. Also, there is now a plan for "partial" conversions: this concerns space over stores and other places where the Government can use only part of the property.

"KAISERVILLE": POP: 40,000

Everyone knows that Henry J. Kaiser is the country's number one shipbuilder. Very few are aware that he is, at the moment, the country's number one builder of war houses. His importation of thousands of workers which he needed for his greatly expanded shipyards was widely publicized; less well known is that Mohamet Kaiser built a city to house them, learned on the spot the importance of community facilities. This huge housing project, built in record time (the 647-acre site was cleared September 15, 1942, is expected to be finished March 1, 1943) is the biggest temporary housing project ever attempted in the United States. Recently named Vanport, the popular name, Kaiserville, will probably stick to the project which will soon be Oregon's second largest city (the first: Portland, 307,572).





NHA

First photo shows a partially constructed five-building unit. Road in foreground is part of the project's nine miles of surfaced roads. Second picture shows a typical two-story family unit. Houses are painted two shades of green, the upper portion lighter. The third shows a typical service building, containing central heating equipment, laundry, bathtubs, etc. Last picture illustrates a furnished apartment, with furniture provided by the company for every residential unit. Individual "homey" touches are the tenant's. Wolff and Phillips, architects.

►Vanport will offer 718 buildings for housing (9,814 war apartments, 100 row houses), an additional 182 service buildings. Community facilities include: 3 commercial centers, 6 maintenance and storage stations, 3 fire stations, 5 recreational halls, 5 schools, 1 hospital, 1 theater, 17 recreational fields, 107 playgrounds, 90 acres of parking lots.

Each group of 3-4 residential buildings has one service building, containing assembly room, laundry facilities, tub baths, ping-pong rooms.

►Most unique feature is that all residential buildings are furnished. Staples: electric ranges, dinette set, beds, chairs, lamps, blankets, a davenport, an ice box.

►Cost: $25,102,000. Prime contractor: The Kaiser Company. Architects: Wolff and Phillips (Portland). Number of building workers on the project: 3,900 (200 women). The Kaiser Company's profit on the job: $2. Rents: To family men only, $7 a week a single room, $10 double, $13 for three.

Fervently summed up Kaiser's engineer, Jerry Kelly: "It'll be the biggest damned thing you've ever seen."

HOUSING PROMOTION

Mourned THE FORUM (Dec., p. 34) at the announcement of the newly established Controlled Materials Plan: "Since war housing has not been classified as a claimant agency . . . it has been dumped into the Office of Civilian Supply along with everything else similarly ill-defined."

Early in January gloom broke a little as WPB announced the establishment of six new "claimant agencies," invited them to nominate members to represent them on the Requirements Committee. To the head of the new class went the National Housing Agency. The others: Office of Rubber Director, ODT, Petroleum Administrator for War, Food Administrator, WPB Facilities Bureau.

MORIBUND TITLES

Early this year, probably by February's end, FHA will reach its insurance ceiling under Title VI (the section under which war housing is handled), soon will face the necessity of getting its authority extended (the present law expires July 1). Also due to expire on that day is old Title I—the section which covers repair and maintenance loans.

FHA's Title VI, now handling more than 80 per cent of the nation's mortgage business, has been operating under a $800 million insurance ceiling. Clearly the private builders' life blood, the approaching exhaustion of these funds makes a transfusion (new Congressional legislation) imperative.

Probability is that one measure will be presented to Congress embodying both Titles: 1) removing the July 1 deadline and setting a later date, increasing the volume of business that may be insured

by a sufficient amount—$500 million is being mentioned and 2) extending the and setting a later date, increasing the lifespan of Title I, which is high in popularity these days when the importance of home maintenance is evident. Other, and more potent reason for its popularity is that it is almost self-sustaining now that insurance premiums are charged for its insured loans.

Congress is expected to treat FHA requests kindly. The law-makers' figure-splitting tendencies will not affect FHA, since this Agency does not ask for appropriations; all it requires is the right to commit the Government to making good insurance losses over and above the reserve funds (which are made up of premium payments).

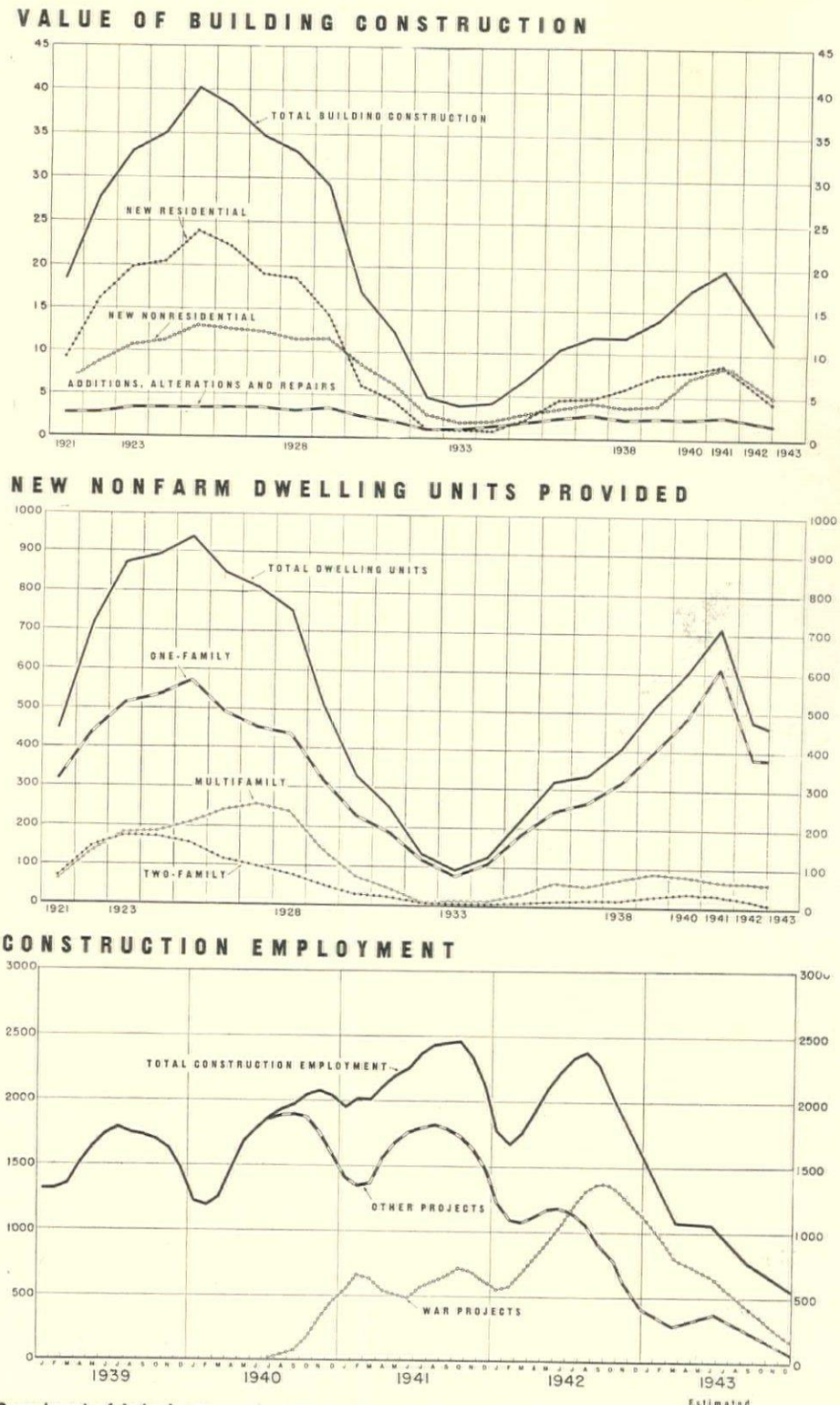
None of these pending appropriations are causing much excitement among builders, who currently are more concerned over restrictive standards which virtually make private building impossible.

ON THE INSTALLMENT PLAN

Early last month OPA's Director of Credit Policy, Rolph Nugent *(see cut, p. 36)*, submitted a highly ingenious memorandum on "Installment Selling for Postwar Delivery," showing how goods could be sold on installment contracts calling for delivery "after the duration," and how such sales would aid in the fight against inflation. To go to the Federal Reserve Board and to the Treasury for comments, the plan is more symptomatic than final.

"It seems doubtful that many persons would be willing to buy, for deferred delivery, goods that can be bought for current delivery. Hence an essential requirement in the selection of goods to be sold under the plan is their unavailability at present. . .Because it is impossible to predict accurately the level of production costs after the war, no attempt would be made to establish at the time of the installment sales the prices at which goods would be delivered. The purchaser would acquire a certificate which would be accepted in payment of the postwar purchase price of a specified article. . .To prevent speculators from acquiring claims to large quantities of goods for purposes of resale, the number of certificates that may be purchased by any one person would be limited. . .Consumers would be offered two incentives for purchasing postwar-delivery certificates: a prior claim to the goods subject to sale, and a discount from the established postwar price.

"Priority numbers would be determined by the month in which the purchaser entered his installment contract, with adjustments for delinquency in making payments. . . The price discount would be accomplished by giving the postwar delivery certificate a 'merchandise' value greater than its purchase price. It is proposed that this be fixed at 10%. . .



Department of Labor's Bureau of Labor Statistics chart series released last month contains three charts of interest to Building. Top chart illustrates the value of building construction as indicated by building permits in 257 identical cities. Second chart shows nonfarm dwelling units provided in the United States, the third, construction employment, as well as estimated employment, for '43. In first two graphs 1942 figures have been completed by THE FORUM from figures provided by B. L. S.

"Certificate sales would be made by established dealer organizations—by automobile sales agencies, by refrigerator and piano dealers and by heating equipment contractors. The purchaser would sign a postwar-delivery contract and make a modest down-payment, varying with the denomination of the certificate, which the dealer would keep as his initial sales commission. The dealer would then send the contract to a sales finance agency that had been authorized by a Federal Reserve Bank to supervise collections and do the bookkeeping."

On Houses, Nugent is vague: "Houses are by far the most important type of consumers' durable goods and the potentialities of their sale for postwar delivery, both from the standpoint of current deflationary

(Continued on page 36)

effects and from the standpoint of peacetime reconstruction are enormous. The difficulties of applying the plan, however, are also great.

"The problem that would arise out of the application of priorities would constitute the primary handicap. Production of houses is localized, and it would be highly unlikely that certificate sales would be distributed in accordance with construction facilities in each community. Consequently, if priority controls were exercised on a nation-wide basis, there would be a shortage of supply in relation to certificate demand in some places and an excess of supply, with resulting unemployment in the building trades, in other communities. Moreover, even if priority numbers were called in relation to the demand-supply situation in each locality—a policy which would be exceedingly difficult to administer—control would be virtually impossible because of the large number of small builders and the difficulty of establishing standard prices for nonstandard goods.

OWI
ROLPH NUGENT: plumps installment buying now

"If prefabricated houses should be offered by a few manufacturers, these problems would be avoided. Postwar delivery sales of such houses would fit nicely into the plan proposed here. For homes that are to be built locally, however, it would appear to be necessary to eliminate the priority feature. While priorities to postwar production appear to be essential at the outset to stimulate widespread public participation in the plan, it may be possible, once consumers have been educated to such purchases, to eliminate the offer of priorities in order to cover goods which do not lend themselves readily to priority control."

SHAPE OF THINGS TO COME

If this session of Congress will make a show of being cool to expenditures, it may have a warm interest in postwar plans. Two bills designed to take up the slack between the approaching near-end of construction and the anticipated postwar boom are Representative Alfred F. Beiter's (*see cut*) "First and Second Postwar Planning Acts," now revised and soon to be reintroduced.

The first calls for an appropriation of $25 million to Federal agencies for the preparation of plans for public works, improvements in the postwar period, another $75 million to state or local agencies for the same purpose. The second bill would authorize the Secretary of the Treasury to issue a special series of War Saving Bonds "at attractive interest rates for sale to State and local agencies to encourage them to accumulate financial reserves for financing postwar public works programs."

As drafted, the bills leave to administrators the question of whether architectural and engineering services are to be dumped into the ample laps of bureaucrats, or whether private practitioners, now almost lapless, will get a break.

Resolution from Taft: The Senate's doors had hardly opened when Senator Robert A. Taft (Rep., Ohio, *see cut*) had introduced a resolution which would direct the Committee on Education and Labor to appoint a special subcommittee to look into war housing with the aid of a $25,000 appropriation. Objectives: to ascertain from NHA and constituent agencies the status of all public and private housing programs. To develop a program for disposition of emergency housing at the end of the war. To develop a program for stimulating home ownership and slum clearance after the war.

As pleased as a condemned prisoner with a reprieve is NHA at the Senator's resolution—strangely sure that Taft's motives are not punitive. The NHA is an emergency war organization, due to be demobilized six months after the war. It is the fond hope of some of the NHA folks that before this fatal date arrives Congress can be induced to give the Agency permanent status.

AP
ALFRED F. BEITER: he would prepare now . . .

The Senator, a free-speaking legislator, is a new voice in the housing wilderness. He feels that there has been too much sporadic growth as far as housing is concerned. He believes that each time someone had a new idea a program would be created, piled on top of existing programs with scant regard to consistency. He says

AP
SENATOR ROBT. TAFT: he has some $64 questions . . .

he wants to find out whether the highly touted "reorganization" of housing agencies really secured some degree of integration. He wants to see home ownership promoted for the postwar world; he wonders why private housing hasn't received some of the Government money lavished on public housing—perhaps to help deserving families buy their own homes.

POSTWAR PIED PIPERS

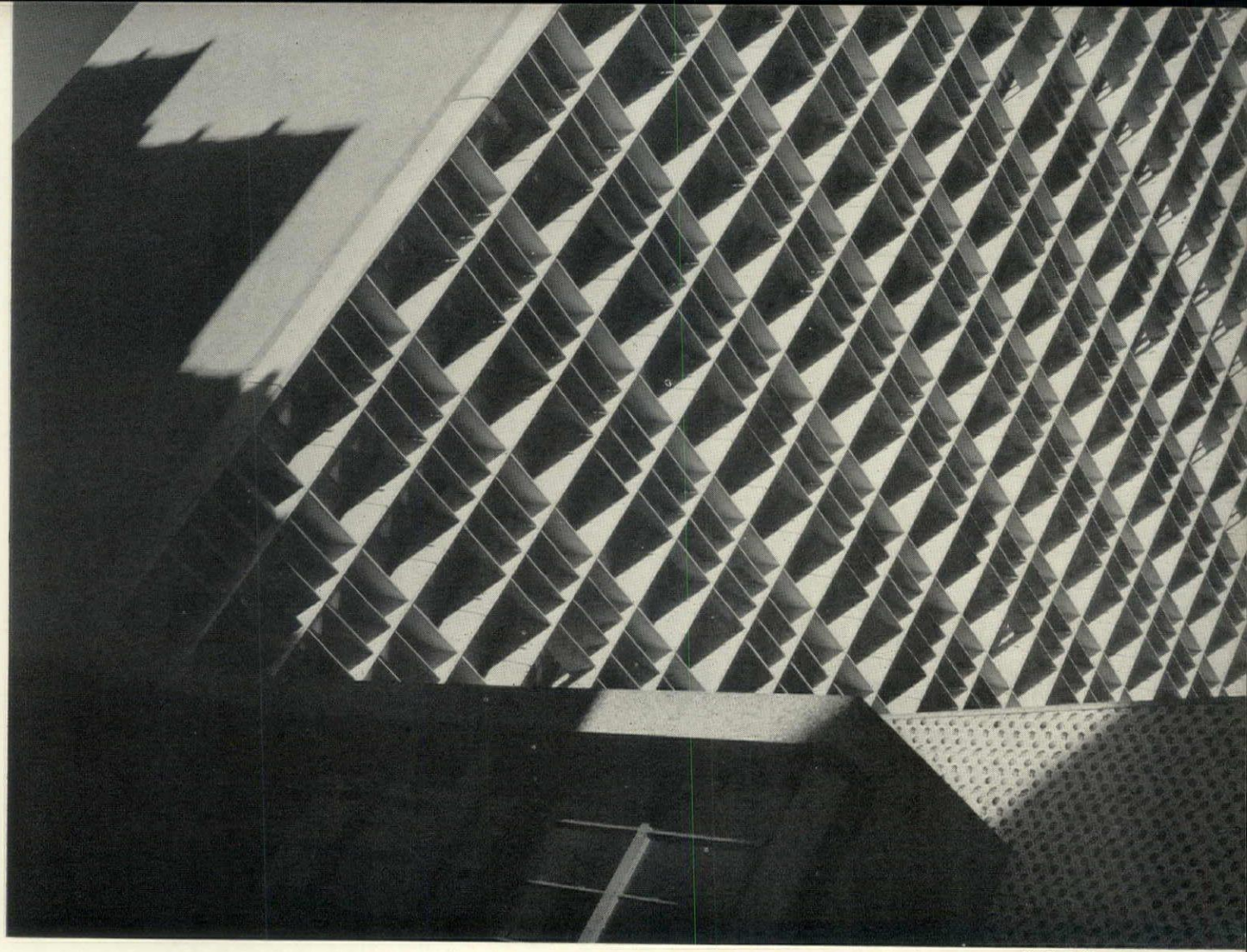
Until very recently postwar planning has been a precocious, anemic, Government baby. But late in the old year some of the United States' most liberal businessmen delivered a baby of their own, christened it the Committee for Economic Development and took the first steps toward schooling it to meet Business' problems of postwar readjustment.

The job before them: To prepare Business for the brave jump from war to peacetime economy. Through research, to answer such questions as: How can high levels of employment be maintained in the postbellum world? What will follow after the war expedients—rationing, plant-conversion, extraordinary taxation, etc.?

Who will do it: A representative panel of long-headed businessmen, theory-sound educators and statistic-sure economists including: Paul G. Hoffman (Studebaker—CED's president, *see cut, p. 90)*; Theodore O. Yntema (University of Chicago economist—head researcher); David C. Prince (General Electric—head Industrial Advisor); Thomas Lamont (J. P. Morgan); Beardsley Ruml (R. H. Macy).

How: With information garnered from business, academic and Government sources, researchers will prepare their reports on all aspects of business problems, which will be sifted by the Advisory panel, approved, made available to anyone interested. Thus far, reports have had only limited circulation. But clearly, when these and later reports are published, the effect of such well authenticated documents will be far-reaching. Said President Hoff-

(Continued on page 90)

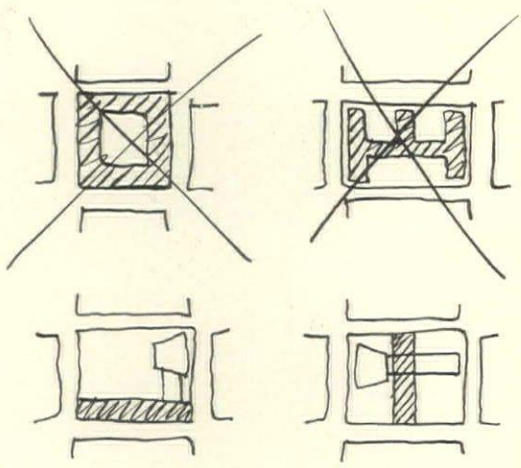


G. E. Kidder Smith

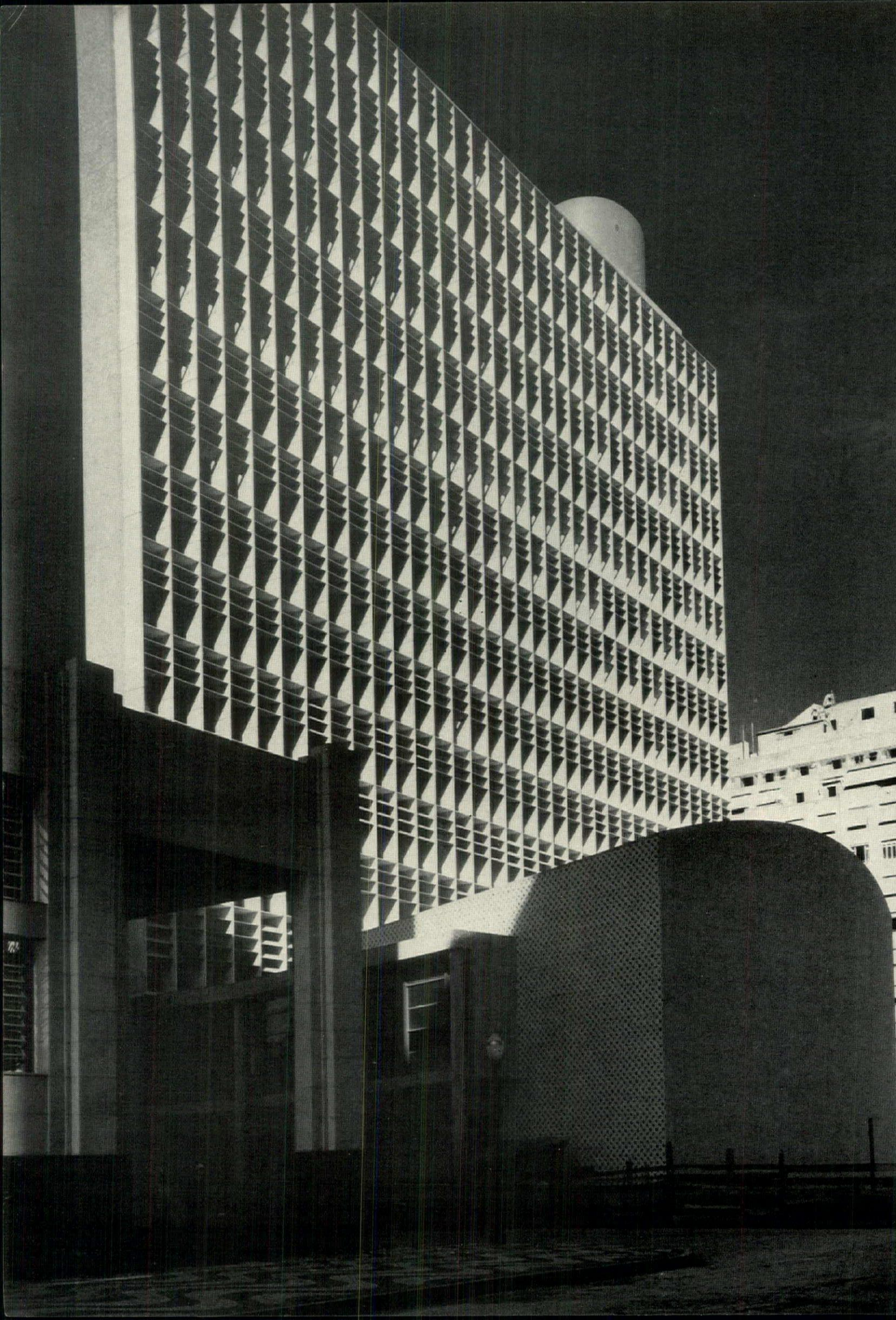
OFFICE BUILDING FOR MINISTRY OF EDUCATION AND HEALTH

RIO DE JANEIRO, BRAZIL

Architects: Lucio Costa, Oscar Niemeyer, Alfredo Reidy, Carlos Leão, Jorge Moreira

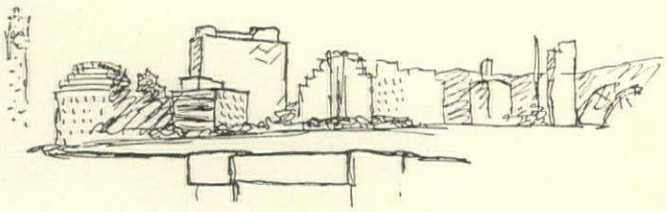


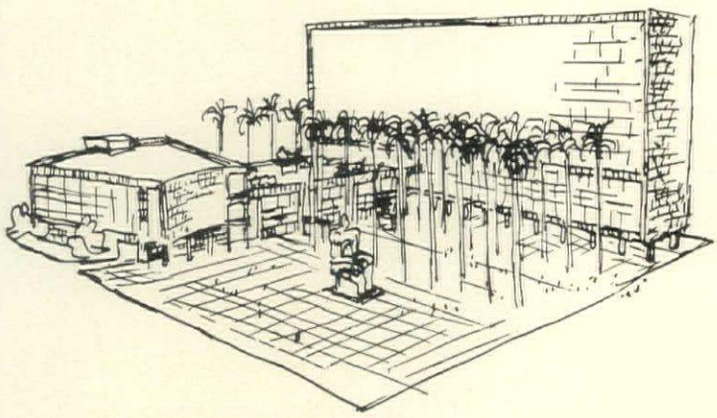
The Ministry of Education and Health, now approaching completion, is probably the most exciting example of modern architecture in the Western Hemisphere. Designed by a group of young Brazilian architects, it demonstrates more forcibly than any of its predecessors that contemporary architecture contains within itself the seeds of a beauty and richness that is different from, but in no way inferior to the building of past ages. It shows, too, that the modern architect, even when commissioned to do a single building, is acutely conscious of the new requirements of city planning. This last point is illustrated by the sketches at the left. The first two, showing conventional plan types for Government buildings, occupy the entire lot and depend on light courts. LeCorbusier, who was in Rio at the time, made the sketch at the lower left: a tall block with a low wing, occupying only a small portion of the plot. The final scheme takes this idea, only changing the location of the two main elements.

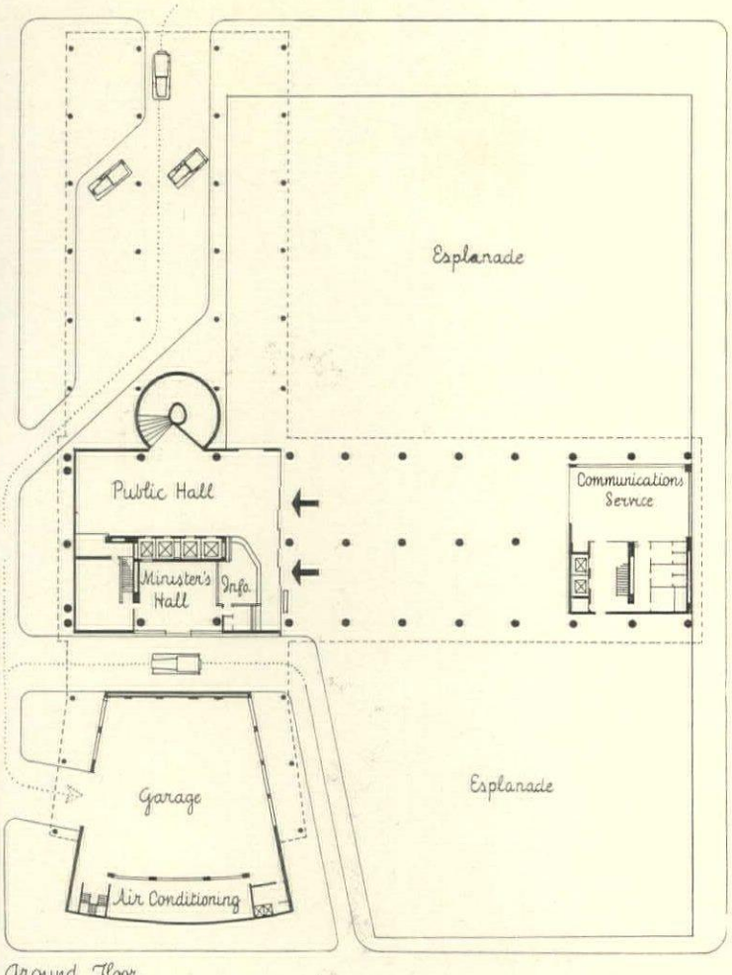


←G. E. Kidder Smith

OFFICE BUILDING FOR MINISTRY OF EDUCATION AND HEALTH







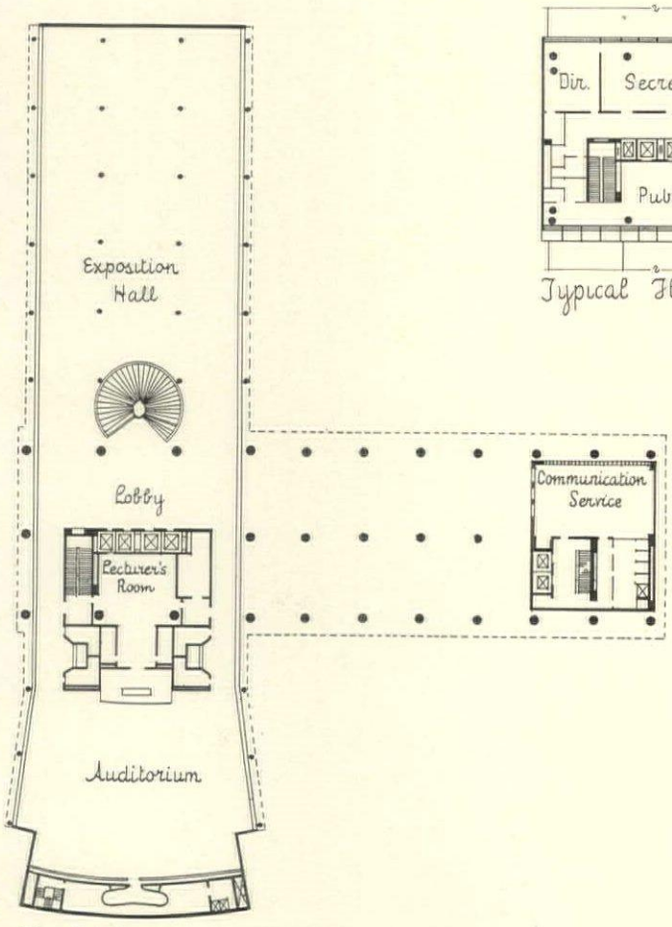
Ground Floor

The concept of the building on stilts is one that was advanced many years ago by LeCorbusier, and its advantages in the congested center of a large city should need no explanation. Here, with free space on both sides of the building and underneath a portion of it, pedestrians can move around in comfort while the offices above can enjoy light and air without robbing neighboring structures. Another feature borrowed from the great Swiss architect is the use of sunshades, designed as an integral part of the structure, which he first proposed in connection with a project for Algiers. These sunshades, manually controlled, give the north face of the building its extraordinary richness and individual character. The extent of LeCorbusier's contribution to this building may be gauged from a comparison of the photographs with his two sketches at the upper left.

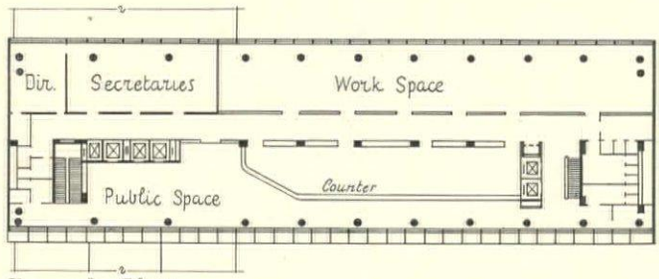
The plan at the left shows in a more precise fashion the manner in which the building relates to its site. At street level there are only a garage and circulation elements, divided according to their use by the public, the staff and the Minister of Education, who has his own private entrance and elevator. Taken as a whole, the solid building area appears to occupy less than 25 per cent of the land available. In Brazil, the Ministry has not been without its critics, for the official attitude towards architecture does not appear to differ materially from that of Washington. The two funnel-like projections at the top have called forth many derisive comments on these supposedly nautical features. A favorite rumor in Rio is that only the architects and the Minister know where the entrances and exits are to be found. Viewed with the perspective given by a distance of several thousand miles, it seems probable that the final judgment of the building will be more favorable. The photographs shown here are part of a large number made by G. E. Kidder Smith, who, with Philip Goodwin, assembled the material for "Brazil Builds," an exhibition sponsored by the Museum of Modern Art and the American Institute of Architects.

Kidder Smith photo

OFFICE BUILDING FOR MINISTRY OF EDUCATION AND HEALTH



First Floor

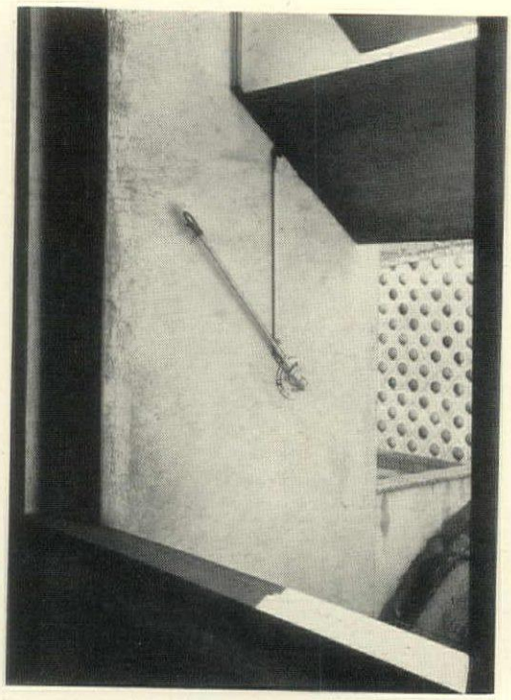


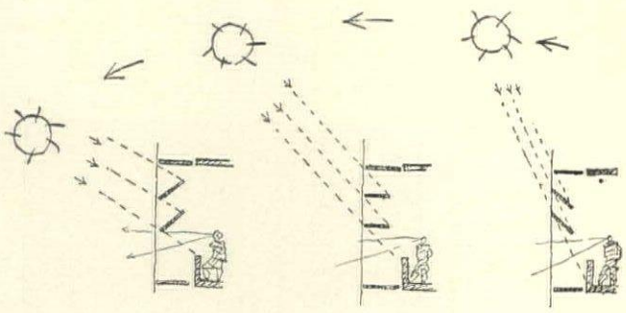
Typical Floor

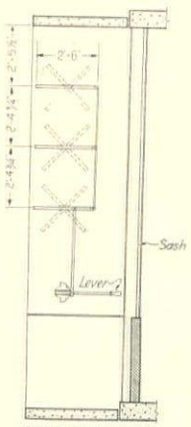
The south face of the building (the same as north in our latitudes) has no need for sunshades, and is consequently expressed as a solid facade of glass. Venetian blinds will be used to vary light intensities. The most unusual feature is the use of glass from floor to ceiling, a treatment for office space which does not explain itself readily. The photographs above show the structure: mushroom columns support the floor slab, with continuous windows along the cantilevered edges; a furred-down ceiling contains acoustical material.

The plan and section above show a typical office floor, with separate aisles for employes and the public. Fixed partitions are avoided where possible, to allow a maximum of through ventilation.

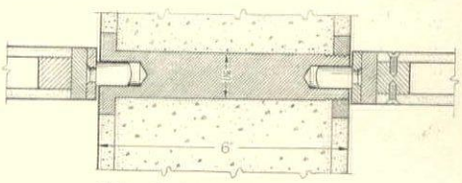
G. E. Kidder Smith



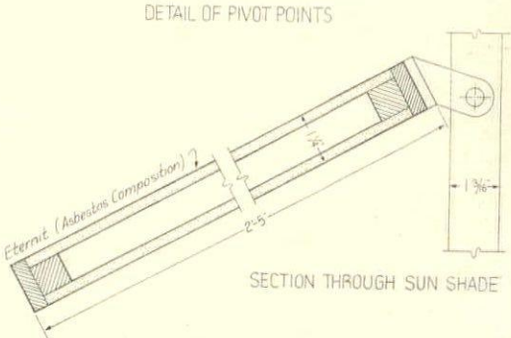




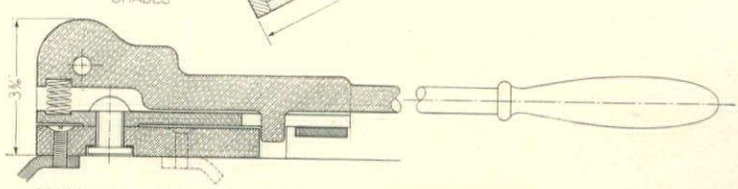
SECTION THROUGH WINDOW & SUN-SHADES



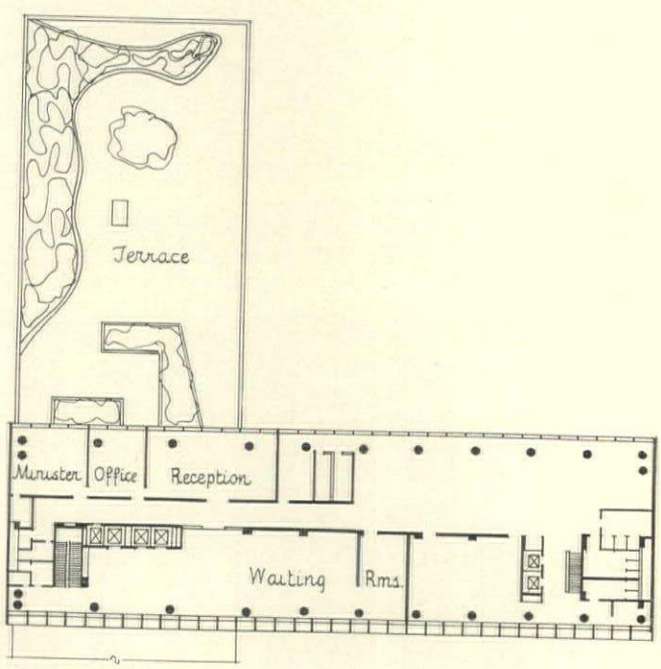
DETAIL OF PIVOT POINTS



SECTION THROUGH SUN SHADE



SECTION THROUGH LEVER MECHANISM

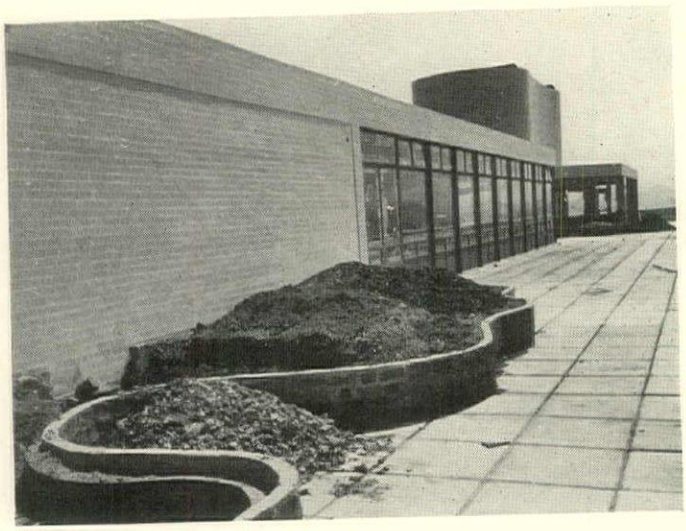


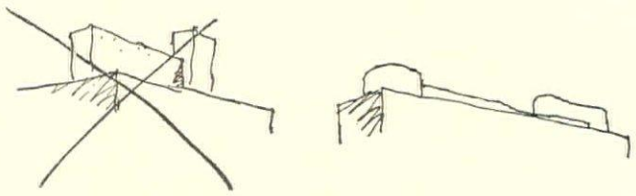
Second Floor

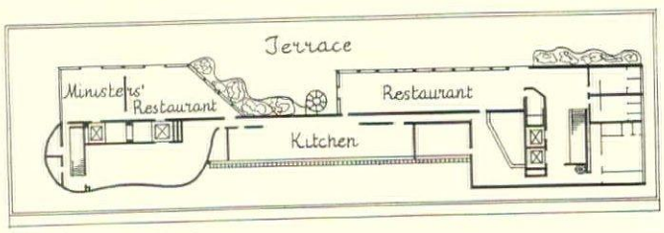
These movable sunshades, like oversized exterior Venetian blinds, are only one of a number of types which Brazilian architects have developed to protect their buildings from the sub-tropical sun. The great advantage of this type is that there is room for free passage of air behind the blinds, and there are no air pockets to transfer heat from outdoors to the rooms inside. The simple manual control also has great advantages, as the amount of light can be regulated in each office as desired. It is also possible, with this arrangement, to control the view to some extent. As will be noted from the photograph on the facing page, the adjustable louvers do not extend the full height of each window: their position was calculated to keep the sun off the windows, and there was no need to provide similar protection for the walls below the sills.

OFFICE BUILDING FOR MINISTRY OF EDUCATION AND HEALTH, RIO DE JANEIRO, BRAZIL

Architects: Lucio Costa, Oscar Niemeyer, Alfredo Reidy, Carlos Leão, Jorge Moreira



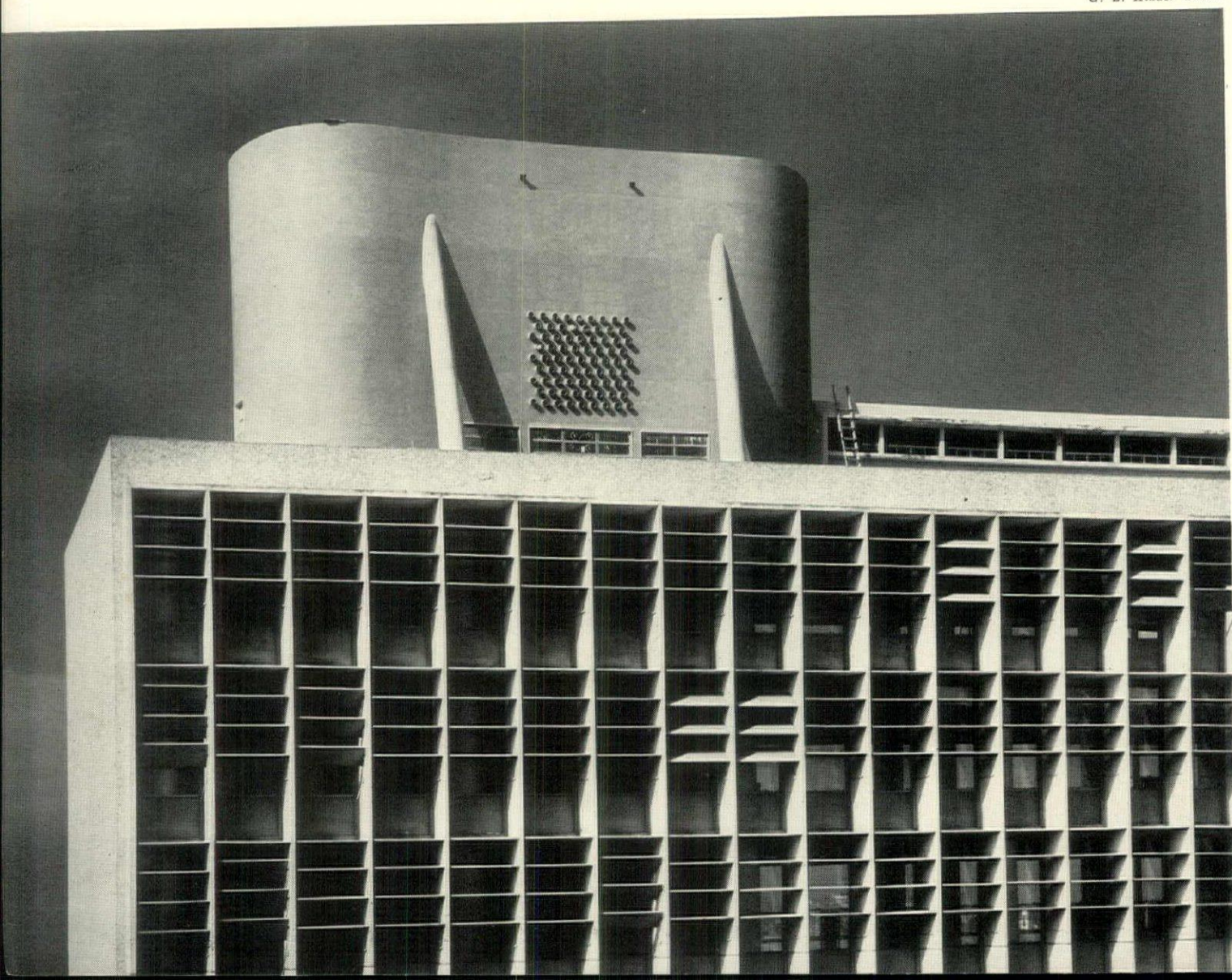




Penthouse & Roof

The entire top floor of the building is used for two restaurants and the terrace which serves them. Few buildings have had a better excuse for such a use of the roof, for it overlooks one of the most magnificent views in the world. The sketches and the photograph show clearly the "funnels" which have provoked such discussion among Rio's citizens. As the plan indicates very clearly, the forms are sculptural rather than purely "functional." There was a good design basis for the selection of freely curved forms, as they serve to emphasize, by contrast, the massive simplicity of the main block.

G. E. Kidder Smith



WHAT MAKES THE HOUSING MARKET?

In which S. Morris Livingston of the U. S. Department of Commerce examines the postwar housing potential by price groups.

Those who are dependent on construction for a livelihood, those who are interested in the latent possibilities for providing people with better housing at prices they can afford to pay, and those who are concerned with the potentialities of construction as a means of maintaining a high level of postwar prosperity have need for a better understanding of the economics of the housing market and the resulting demand or lack of demand for new residential construction.

Why was new residential construction in the decade between 1930 and 1940 considerably less than the increase in families? Why have we never had a real replacement market for housing? Why has the emphasis on small cheap housing been greater in the last ten years than it was twenty years ago? Will the economic influences which dominated the housing market in the thirties continue or will they be radically different?

We can clarify our thinking on these and similar problems if we distinguish between the market for housing and the market for new residential construction. The effective demand for housing depends very largely on (a) the number of families, and (b) their income. The demand for new construction is determined largely by changes in the effective demand for housing. In other words, it is largely the result of the increase in the number of families plus or minus the change in their income. Of these the change in income, or more specifically the change in the purchasing power of that income, is by far the more important.

Family formation depends partly on population growth at the marriageable ages. In other words it depends on the birth rate twenty to thirty years ago minus deaths plus or minus immigration or emigration. It also depends to a considerable extent on incomes. Over the last twenty years there has been an average net increase of about half a million families per year. This rate declined to about three hundred thousand in 1932 and 1933 and had risen to about 700,000 even before war marriages had become important. That the much talked of decline in population growth was not a dominant influence is evidenced by the fact that the net increase in families from 1936 to 1940 was greater than during the peak of the construction boom of the twenties.

Strictly speaking, we are concerned not with the family in the sociological sense but with the household, i.e., a family occupying an independent dwelling unit. The "doubling up" of one or more families in a single dwelling unit is not entirely a depression phenomenon since it exists to some extent even at the height of prosperity. It is, however, strongly influenced by family incomes. Presumably, if 1929 had been followed by continually rising consumer purchasing power, there would have been further undoubling instead of the doubling up which was actually observed.

Given the number of households, and therefore the number of dwelling units required, we still know comparatively little about the housing market. How much housing can each of these households afford? How much of the market is in the price class where it coud be reached by a given reduction in construction costs? Is the net increase in the number of households over a stated period concentrated in the very low income groups or is it made up largely of people who can afford to buy a new house?

The amount that families can or will pay for housing is again closely related to their income. The concensus of various analysis of consumer budgets is that the average household pays out about one-fifth of its total income, after savings and taxes, for housing. Furthermore, this relationship seems to hold almost regardless of income level.

There are important exceptions to this rule. People are slow to adjust their scale of housing to meet rapid changes in incomes. It is even conceivable that in the future the relationship could be changed within narrow limits if the consumer is able to get more or less for his housing dollar relative to his expenditures in other fields. Nevertheless this is a convenient and useful basis for analysis.

The effect of family formation and changes in family income on the housing market, and in turn on the market for new construction can be illustrated by what happened in the decade from 1930 to 1940.

RECENT MARKET CHANGES

When the census was taken in April, 1930, the 23,236,000 nonfarm households had a total rent bill of about twelve billion dollars per annum.* This includes the imputed rent of owned homes at 1 per cent of the reported market value per month. Because of the usual delay in adjusting housing expenditures to changes in income, it reflects the level of incomes some months earlier. Also in estimating the value of an owned home, the difficulty of appraising current market conditions appears to have led to a tendency to disregard these conditions in favor of the somewhat higher price actually paid for that property or the sales of comparable properties at an earlier date. We have not adjusted the census data to eliminate this bias, and therefore the rental values more nearly reflect 1929 incomes.

In April, 1940, a slightly smaller total income was divided among 27,750,000 nonfarm households so that the average income per family was substantially less. The total annual

**The analysis is limited to the nonfarm market because the data on the farm market are less complete.*

rent bill as reported to the Census was less in April, 1930, by a little more than the decline in income between 1929 and 1939. With the increase in households the average rental value was about $26 as against about $43 in 1930.

CHART I.

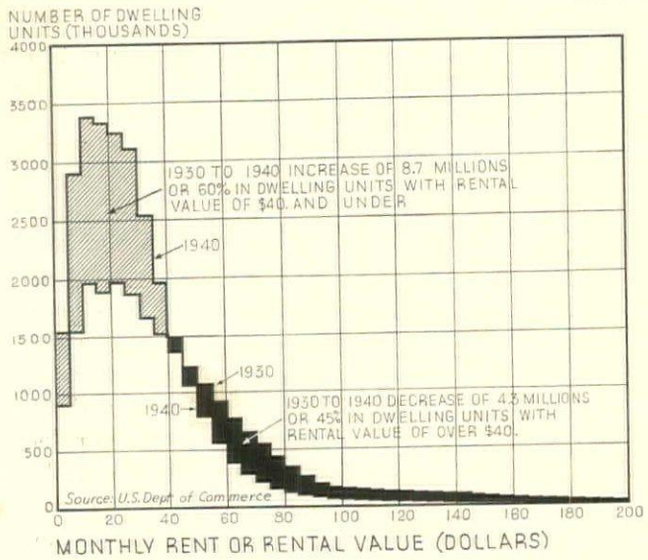


Chart I illustrates in more detail this change in the housing market. In 1930, 60 per cent of the families were living in houses with a rental value of $40 or less. By 1940 80 per cent were in this price class. In spite of a 20 per cent increase in the total number of nonfarm households there was a decrease of almost 50 per cent in those occupying a dwelling at more than $40 per month. There was a correspondingly larger increase of 60 per cent in those who could afford to pay $40 or less.

Here is a rough measure of the effective demand for housing on the two dates. It cuts across all the hypothetical discussion of the kind of houses people ought to live in or would like to have. With less income per household in 1940, the expenditures for housing declined in almost equal proportion.

The change in the shape of the curve indicates the shift in the effective demand for housing. It is not a measure of the actual deterioration of these structures over the decade. The six million dwellings with a rent or rental value of more than $40 in 1930 which had been handed down to a lower bracket by 1940* can be accounted for only partially by any reasonable depreciation and obsolescence, or by any change in construction costs. They must be explained by the excess of the 1930 supply over the 1940 demand in the higher brackets. Given this excess, competition forced prices and rents down to what people could afford to pay. Consumer income was the pattern for the curve. Competition forced the existing supply of housing into that mold.

If we had adequate data for an intermediate year, say 1934, an even greater shift to the left and an even larger proportion of the demand in the low-price field would be revealed. They would also show some "doubling up" of two families in one household. Most of the increase in households occurred in the last half of the decade.

This shift in the effective demand for housing was the dominant influence affecting new residential construction between 1930 and 1940. Throughout the decade the aggregate supply of housing exceeded the demand over most of the price range where new construction could compete with existing dwellings. This was not true for houses costing $4,000 or less, including land and utilities. Hence the pressure to construct very low cost housing.

That there was any construction at all in the price range over $4,000 must be explained largely by the lack of a homogeneous market. In spite of the aggregate over-supply of dwellings in the higher price classes, there were shortages in some places. In other localities owners or mortgage holders were reluctant to force distressed real estate on the market while the construction industry was much more anxious to cut prices in order to make a sale. Also there was the usual demand for custom-made dwellings to meet the requirements of particular families almost without regard to the competition of the second-hand market.

The 4.5 million additional households in 1940 were housed partly by this new construction, partly by absorption of some of the 1930 inventory of vacant dwellings and partly by use of shacks and trailers, conversion of existing structures to house more than one family, and other alternatives to new construction. These alternatives assumed a larger role than in the previous decade because the shift in demand made the supply of cheap housing inadequate.

The increase in effective demand was all concentrated at the lower end of the price scale. This precluded the development of a large replacement market. Since the demand for very cheap housing exceeded the supply, comparatively few dwellings were demolished. Even though many of these dwellings were socially undesirable, they served the practical economic purpose of providing shelter at prices people could afford to pay. Slum clearance projects made little progress because of the high cost of acquiring and tearing down the structures they were designed to replace.

THE POSTWAR POTENTIAL

With this background we are equipped to take a look at the future—not in a spirit of prophesy but to examine the influences at work on the housing market. For this purpose let us arbitrarily assume that the war will be over by 1945, and that the maintenance of a high level of peace-time production and consumption will provide jobs for all but a small fraction of those seeking employment.

By 1945 there will be about 31½ million nonfarm households. This allows for the marked effect of high incomes on family formation and will not be true if a decline in incomes causes postponement of marriage and doubling up of two families in one household. It may not make sufficient allowance for war marriages, but even so the increase of 3.8 million households in the five years from 1940 to 1945 compares favorably with the increase of 4.5 million in the ten years from 1930 to 1940.

The amount that these people will have to spend on housing depends on a great many influences, the effect of which cannot be gauged accurately in advance. Total nonfarm income is already more than 60 per cent above the level in 1939 which was reflected in the housing expenditures in April, 1940, and a further increase is probable in reaching this level. The abnormal types of war workers and the longer hours of work are just about offset by diversion of

**In spite of almost three million dwellings constructed during the decade, mostly in this price range, the total at the end of the period had decreased over four million.*

manpower to the armed forces. It can be calculated that, with the increase in population and a continuation of the past trend toward greater output per manhour, our normal labor force, working normal hours in 1945, should be able to equal our current output. Whether the resulting dollar volume of income in the hands of consumers will also equal the present rate will depend to a considerable extent on what happens to prices.

There is a further difficulty in that the proportion of the consumer dollars spent for housing can vary within narrow limits depending on whether the construction industry offers better value relative to other fields of expenditure.

Since we are not engaged in forecasting, we can afford to simplify our analysis by an arbitrary assumption even though we have doubts as to its validity. Given full employment and the current 1942 price level, it is reasonable to expect that expenditures on housing in 1945 will be about 80 per cent above those reported for April, 1940. The same assumption can be put in less startling terms. Nonfarm income is already about 35 per cent above April, 1930. With a continuation of the present income, it is reasonable to expect a return to the 1930 rate of expenditure per family which is almost 60 per cent above April, 1940. The increase in families makes up the balance of the 80 per cent.

Most people do not expect the current 1942 price level to hold, but for the moment we can get a clearer picture of the outlook by making this assumption.

More important than the increase in total housing expenditures is the rise in the income per family and the consequent shift of effective demand to the higher price classes. The average family in April, 1930 lived in a dwelling with a rent or rental value of about $43 per month. In April, 1940 the average rent or rental value as reported to the Census was $26. In our hypothetical year 1945 the average family could again afford to pay $43 per month.

With the same average, the distribution by price classes would be different than in 1930. Even before the war, the number of families which could afford a dwelling costing more than $15,000 was probably no greater in absolute terms, and certainly less relative to the total number of families, than at a comparable level of income a decade earlier. This was balanced by a decline in the relative number of very low-income families.

The tendency is clearly indicated in several ways even though it cannot be measured with any accuracy. With full recovery to the 1929 level of national income there were fewer people reporting incomes of over $10,000 and their purchasing power had been reduced by much higher surtax rates. Over the same interval there was an appreciable increase in the wage earner's weekly pay. The result can be seen by comparing the distribution of rental housing by price class for one group of States in 1940 and that for another group which had approximately the same median rental in 1930.

This redistribution of purchasing power is not likely to be reversed by 1945 and it has an important bearing on the shape of the curve of housing demand in 1945. Chart II is adjusted accordingly but all that is claimed for the result is that it is probably nearer the truth than if no correction had been made.

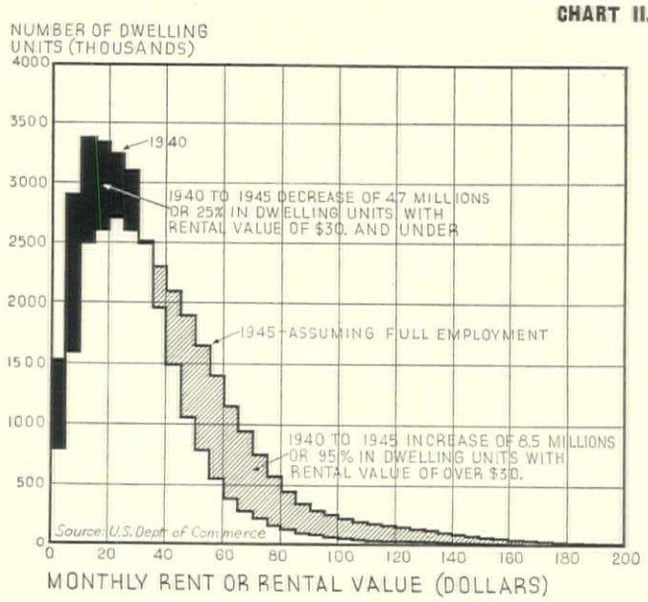
The enormous market created by the five-year increase in households plus our hypothetical shift in effective demand is measured by the areas between the two curves. The demand for nonfarm houses having a rental value of over $30 per month would be eight or nine million dwelling units greater than in 1940. On the other hand, and in spite of the increase in the total number of families, the demand for dwellings with a rental value of $30 or under would be four to five million less than the number occupied in this price range in 1940.

The first effect of this shift in demand woud be to force a mark-up of the prices of existing structures. Even in a construction boom, the number of new dwellings built in a year is so small an addition to the total supply of houses that the market is determined largely by the demand relative to the existing supply. New construction could not possibly meet such a demand fast enough to prevent people from bidding against each other for the older dwellings.

The participation of new construction in this market depends of course on the ability to offer the consumer more for his housing dollar than the second-hand dwelling. Given no greater increase in construction costs than has already occurred in the last two years, and five years of added depreciation and obsolescence of the 1940 structures, the competitive position of new construction should be no worse than it was at that time. The possibilities for designing a better house at no greater cost encourage the hope that this competitive position relative to the prewar house will be greatly improved.

The area between the two curves on Chart II indicates a potential effective demand for eight to nine million additional dwellings costing over $3,000 each. This figure needs to be discounted in several ways. While the 1940 prices of existing structures were generally in line with the prices of new dwellings, there were some houses which could be marked up to a higher price class and still compete favor-

CHART II.



ably with new construction. Furthermore there is the possibility of modernizing old structures, thereby putting them in a higher price class at considerably less expenditure of labor and materials than would be required for new construction. Also, between 1940 and 1945 we will build somewhere between two and three million dwelling units, most of which will be between four and five thousand dollars each.

The housing market, created by full employment, will require an enormous volume of new construction—sufficient for a succession of five billion dollar years such as have not been seen since 1927.

It would be quite inaccurate to call this a deferred demand. In only a very limited sense does the forced curtailment of construction during the war automatically create a postwar market. Demand for better housing always exists provided people have the necessary purchasing power. If their incomes are not increased, or if the industry cannot cut its costs to fit their purse, the demand can be deferred indefinitely. If their incomes are reduced, or if there is a sharp inflation of construction costs, we can easily revert to the stagnation of 1932.

This analysis of the effect of full employment makes no allowance for the possibility of increasing the proportion of the consumer's dollar spent for housing. While this allocation is not likely to vary over more than a narrow range, it does depend to some extent on what can be obtained for that expenditure. If the industry can produce a strikingly better house at lower cost, it is conceivable that there might be fewer shacks with high-priced cars parked in the yard. If the industry cannot meet this challenge it is possible that the proportion of housing expenditures will be reduced and the balance spent for helicopters, television sets or whatever gadgets our postwar industry produces.

THE REPLACEMENT MARKET

It is important that the very large residential building demand to be brought about by full employment would be in considerabe part a replacement market. We have never had a real replacement market for houses. Dwellings usually have been torn down only because the site became more valuable for some other purpose. Rarely has a single family house been torn down to make room for another single family house. This is clearly indicated by comparing population growth with new construction over the last two decades.

With a net increase of 5.5 million nonfarm households from 1920 to 1930, there were about seven million new dwelling units built, a million of which were added to the inventory of vacant dwellings. From 1930 to 1940 there was a net increase of 4.5 million nonfarm households but, for reasons which we have already indicated, new construction was less than three million dwelling units.

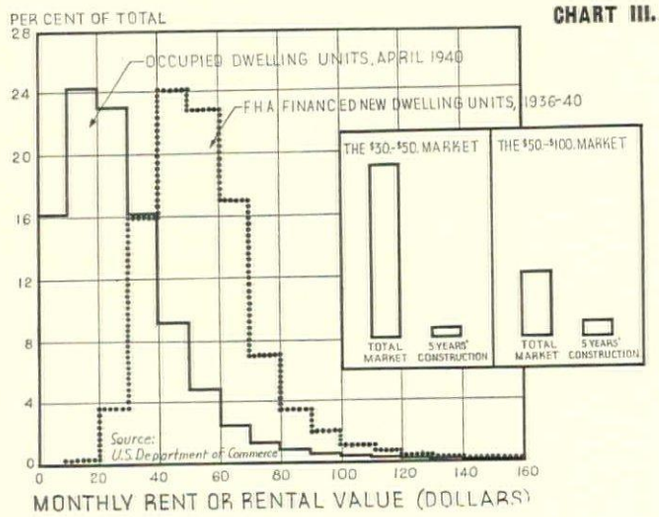
We may now be looking forward to a replacement market at least as important as the market created by the increase in the number of households. There were about four million houses with a rental value of less than $20 per month in 1940 for which there would be no market with full employment in 1945. That is, there would be no market if new dwellings could be built fast enough to satisfy the demand for better housing.

Under these conditions the rotting out of blighted areas would be greatly accelerated. The need and the opportunity for urban rebuilding would be correspondingly accentuated. This potential shift in effective demand from poorer to better housing has an important bearing on the future character and location of residential areas and therefore on the whole problem of long-range regional planning.

This replacement demand depends again on what happens to construction costs. If these costs go up as fast as consumers income, the net effect will be an inflation of prices of existing structures rather than a demand for new construction.

In the other directions the potentialities are enormous. Even with full employment, and the consequent increase in the demand for higher priced housing, only one-third of the households could afford to pay over $5,000 for a house.

CHART III.



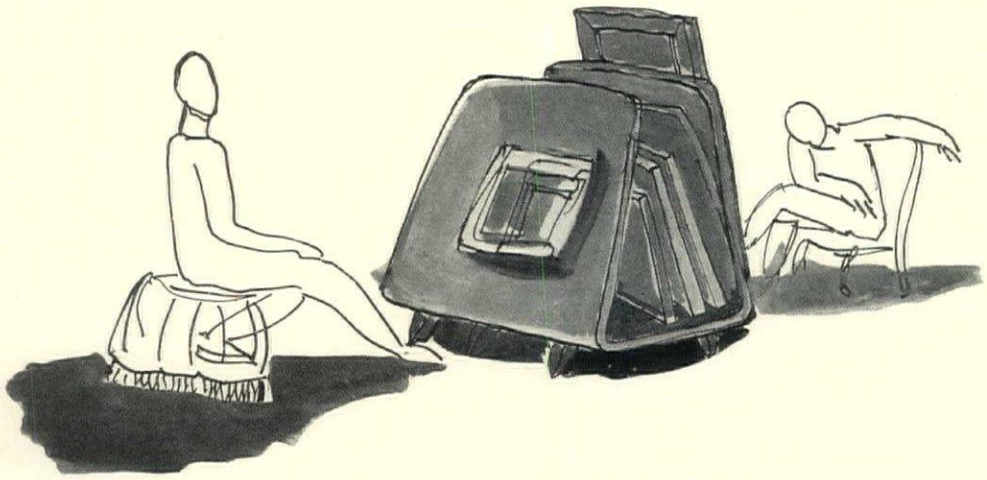
Another third would fall in the $3,000 to $5,000 price range—a mass market which we have hardly begun to exploit.

The number of houses constructed for less than $5,000 in recent years has been small relative to the total number of dwellings in this price class which might be displaced. As indicated in Chart III, and with due allowance for the fact that FHA data is not representative of all construction, over half of the dwellings constructed in the five years prior to the war cost over $5,000. About 40 per cent cost between $3,000 and $5,000, but only one family out of every eight or ten in this price class in 1940 occupied a dwelling built in the previous five years. A larger proportion was constructed for the much smaller $5,000 to $10,000 market so that one family out of every two or three in this price class in 1940 was living in a dwelling built in the previous five years.

Houses constructed for less than $5,000 have not been sufficiently better than the second-hand structures at the same price to cause any widespread displacement of such structures. Low-cost housing has been achieved in larger part by drastic reduction in the size of the dwelling and by elimination of all but the bare essentials. Such housing has served a useful purpose. Frequently it has become closer to meeting the requirements than the alternative second-hand dwelling. As with the first primitive Ford car, it may be the starting point for something better.

There is an enormous potential market if the industry can meet this challenge. The construction industry need not be afraid that it cannot contribute its full share to the job of maintaining full employment. There are tough problems to be solved, but their solution will create a very large demand for residential building and indirectly for many other types of construction.

Previous articles on postwar housing published by THE FORUM: *Postwar Pattern* (May, 1941). No. 1: *Planning* (Sept., 1941). No. 2: *Standardization* (Nov., 1941). No. 3: *Integration* (Oct., 1942). Further articles will appear at frequent intervals.



NEW DISPLAY TECHNIQUES

for "Art of this Century"

Designed by Frederick J. Kiesler

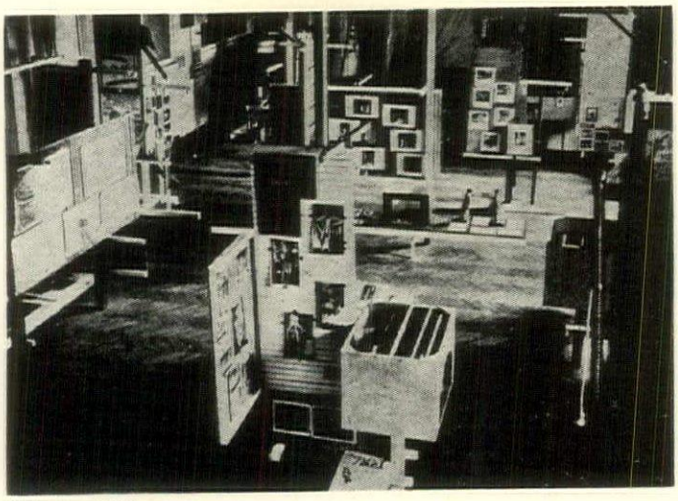
Several months ago a new art gallery was opened in New York with an unusual accompaniment of newspaper publicity. Called "Art of this Century," it contained a permanent collection of modern painting and sculpture, assembled by Miss Peggy Guggenheim. The collection, representing all of the many phases of modern art, was sufficiently complete and had enough big names to attract plenty of attention. What seemed to intrigue the papers, however, was not the collection as much as the manner in which it was displayed.

There were paintings in boxes with peepholes, paintings suspended in mid-air, paintings bewilderingly framed in mirrors. One group, on a motor-driven endless belt, appeared only when the visitor interrupted a beam to a photo-electric cell. Sculpture was displayed in a similarly unconventional manner. In the many comments, ranging from the ecstatic to the amused which appeared in the press, two facts were generally overlooked. One was that this method of "display in space" was not a sudden freak invention, but a technique developed by Kiesler almost 20 years ago; the other was the fact that modifications of this method have been appearing museum displays and department-store show windows for quite a long time.

Herrmann—Pix

To Kiesler, the framed picture on the flat wall is anathema—"a decorative cipher without life or meaning." From his earliest exhibitions he has attempted to present the artist's work as "a vital entity in a spatial whole," to destroy the implication that painting is nothing more than a decorative spot on an otherwise uninteresting wall.

Work in the galleries is arranged in four rooms, one of which, the "painting library," is shown in the sketch and photograph on this page. Here there are a series of storage-display stands for small pictures, where the visitor may sit and look at his convenience. These two illustrations, incidentally, show an interesting contrast between concept and realization: the sketch indicates a stand with an open top, constructed, obviously of laminated wood. The furniture as executed, on the other hand, has a closed top which indicates with equal directness the limitations of conventional construction in wood. Both appear equally suitable for their purpose.

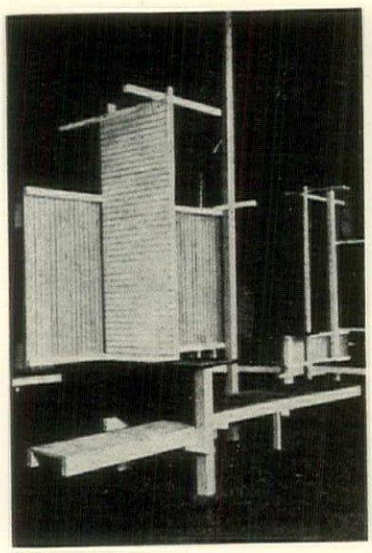


Vienna, 1924

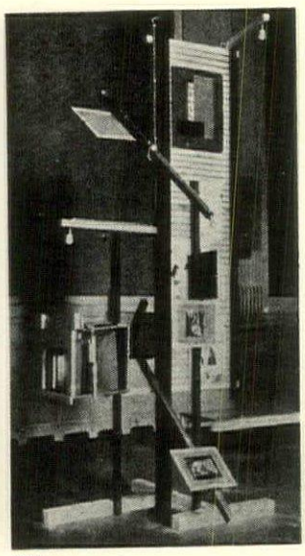
1924
(Vienna)

The first demonstration of the "spatial exhibition method" was made by Kiesler, at the Theater and Music Festival of the City of Vienna, in 1924. Here are the comments of Theo van Doesburg, Dutch architect and editor, written in October of that year: "While traveling through Germany, France, Holland and Italy, I studied the results of the newest endeavors in the field of architecture. I was completely taken by surprise when I faced the completely new form of demonstration at the 'International Theater Exposition of New Theater Technique' at Vienna. In no city in the world have I seen anything similar to it. In contrast to previous exhibitions, in which art products were hung next to one another without relation, in this method of demonstration the closest relations between the different works were established, by their arrangement in space. It is extremely important and fortunate that the Theater and Music Festival of Vienna has found a basic, practical and economical solution to this problem in the new exhibition system created by Kiesler."

The upper three photographs show the use of cantilevers, of displays at right angles to each other, of displays tilted to give a better view. These methods have been widely used, in many forms; in 1924 they had all the excitement of a new discovery.



L-Type

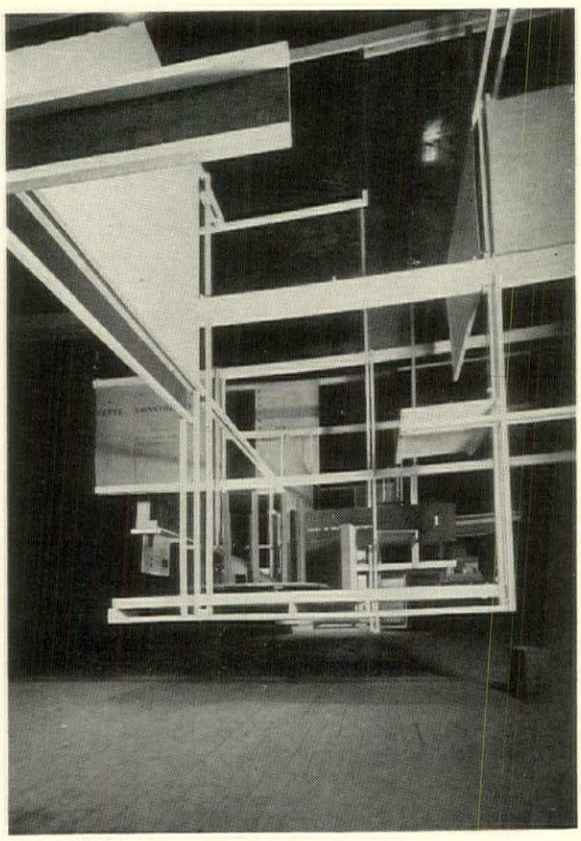


T-Type

1925
(Paris)

The second demonstration, also by Kiesler, took place at the 1925 World's Fair in Paris (bottom, left). The notes in the exhibition catalog were written by Maurice Raynal, a French writer on art: "A building system of free tensions in space; and the creation of new demands on life, and through them, demands for new living conditions—these are some of the new and practical ideas so brilliantly incorporated in his construction."

In this exhibition Kiesler developed his idea much further. The entire show was hung from the ceiling, using standard wood members bolted together. Within the rectangular framework the exhibits—models, drawings, photographs, descriptions—were organized to form related units.



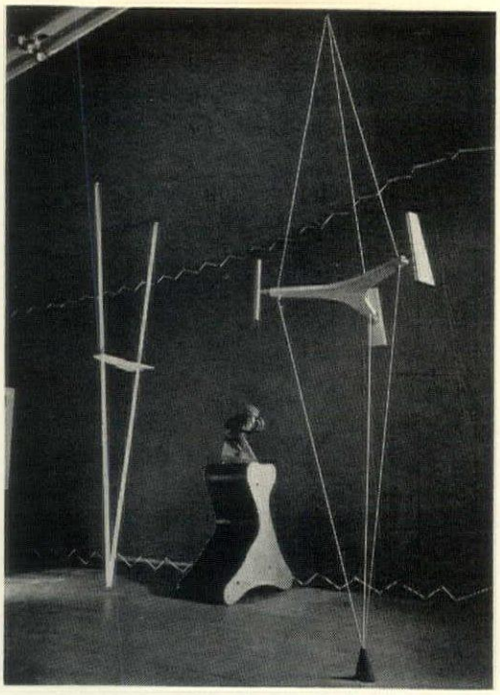
Paris, 1925

1926
(Dessau)

The following year, 1926, Kiesler was asked by the Bauhaus at Dessau to write a book on his new method. In the same year the Vienna exhibition was shown in New York.

1942
(New York)

The designs for the Guggenheim Gallery in New York represent a continuation of these earlier ideas. The walls, it will be noted, are still bare: the pictures hang in space, supported by ropes, straps or tape. For display of the three-dimensional abstractions, Kiesler sometimes uses his all-purpose chairs, sometimes stands which are supported in the same manner as the pictures. The four-square rigidity of the exhibitions of the 1920's has been replaced by an almost baroque freedom of line and form.

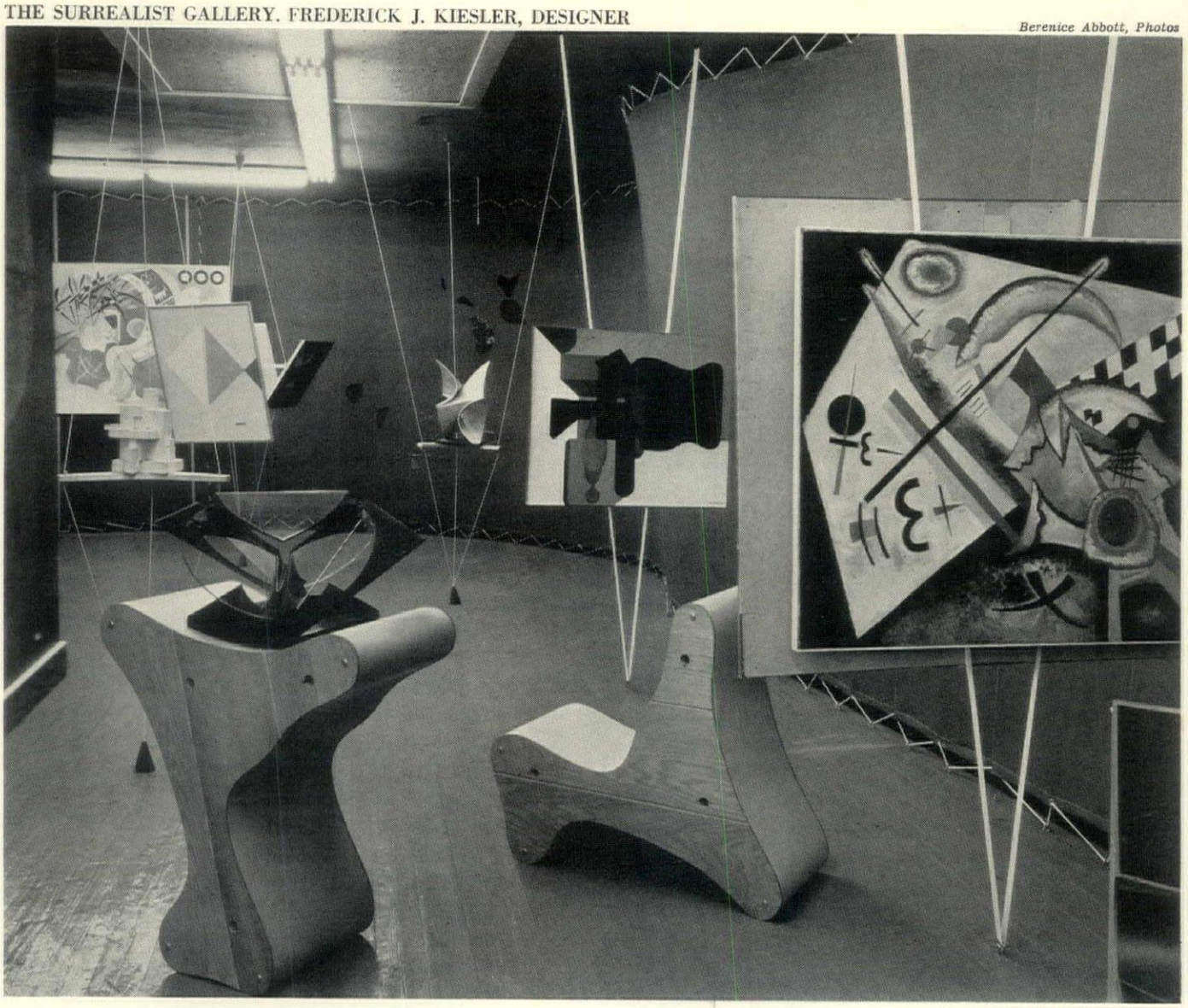


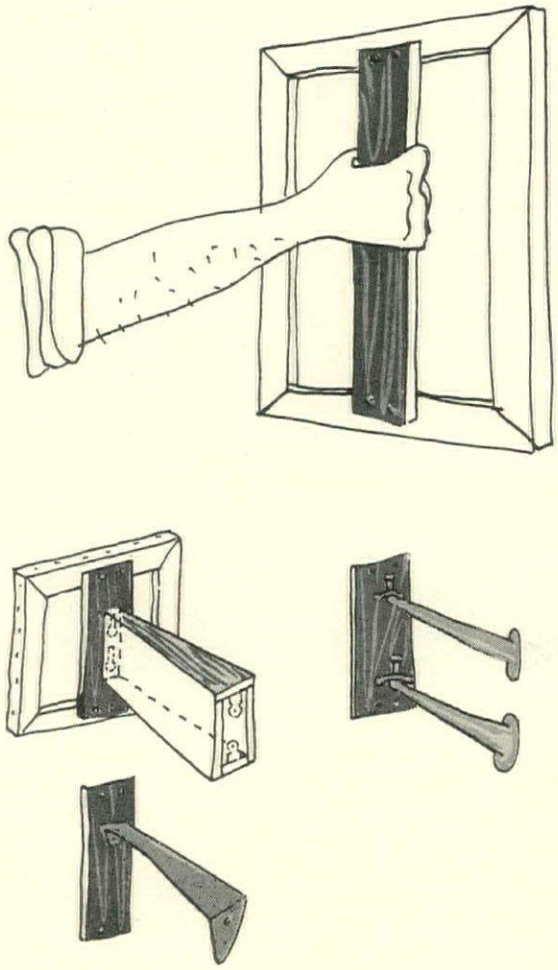
Supporting frameworks of cloth tape and rope for picture display. Wooden wedges are used to hold the pictures in place.

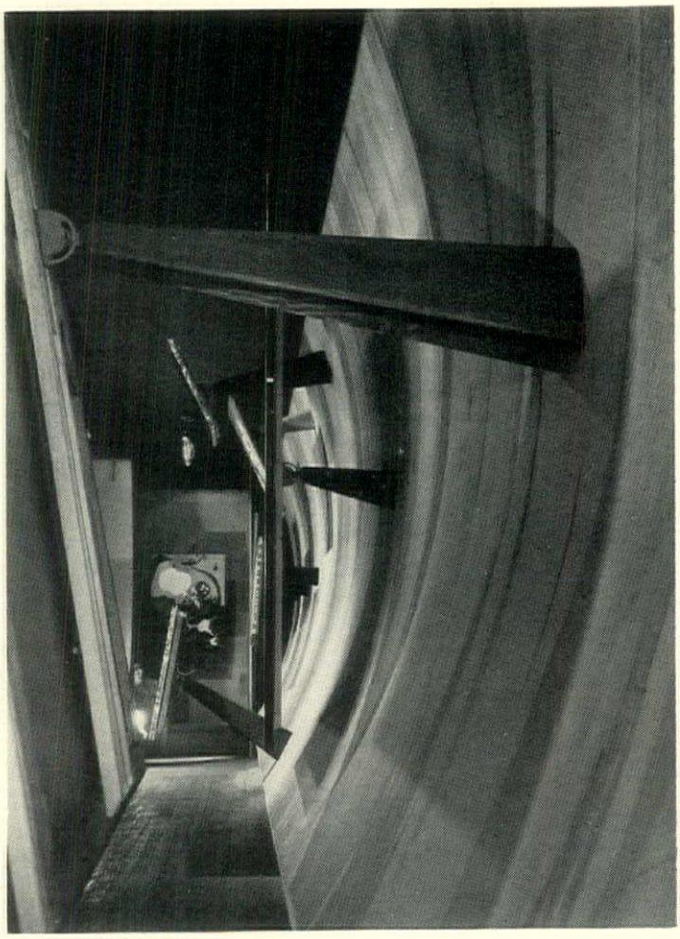
Each wedge has a universal-joint fastening so that the picture may be tilted in any direction. Method of hanging is shown by the back view of one of the paintings.

THE SURREALIST GALLERY. FREDERICK J. KIESLER, DESIGNER

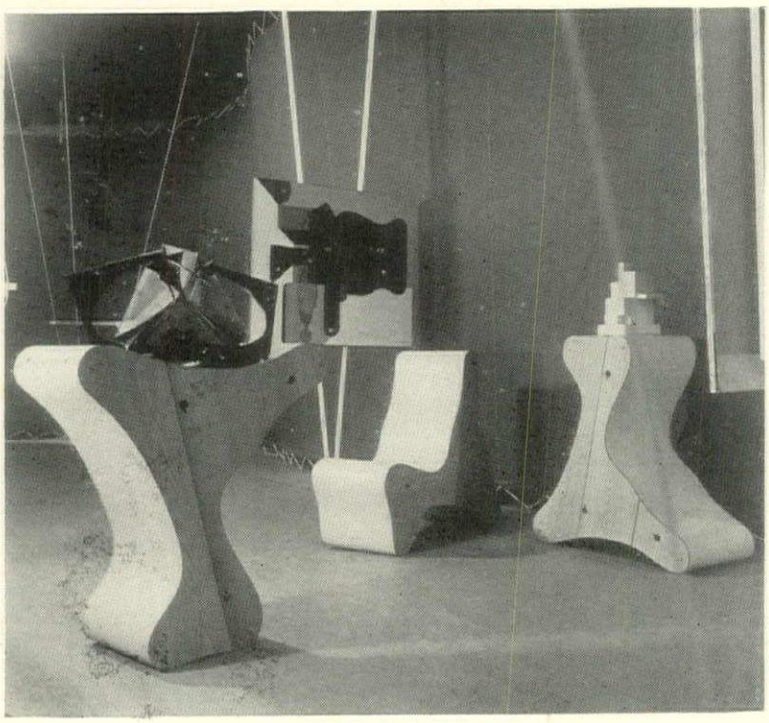
Berenice Abbott, Photos







Kiesler's aversion to flat wall displays led to the creation of a tunnel-like room in the Surrealist Gallery, with picture supports based on the idea of the outstretched arm shown in the sketch. Pictures are individually lighted and are "framed" by the space around them. Walls are of thin plywood; the ceiling, also in the same material, is used for a great number and variety of lighting fixtures, some concealed, some exposed. Most amusing of the many ingenious display devices are the multi-purpose chairs, whose actual and potential uses range from sitting to supporting paintings and sculpture. Eighteen of these uses are indicated in the sketches below; others appear in the photographs.



1. Sitting 

2. Reclining 

3. Small sculpture support 

4. Wide-base model support 

SURREALIST GALLERY. FREDERICK J. KIESLER, DESIGNER

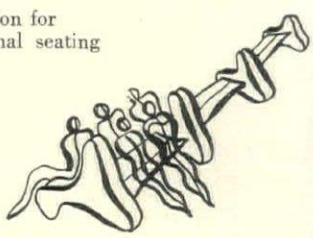
Berenice Abbott, Photos

Low seat

9. High support (poles through holes in sides)

13. Extension, left and right

16. Extension for additional seating



Low display platform

10. Inclined viewing table

14. Continuous horizontal support

High table

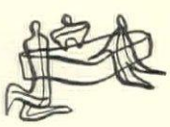
11. Combination sculpture and painting

17. Picture stand, adjustable

15. Continuous vertical support

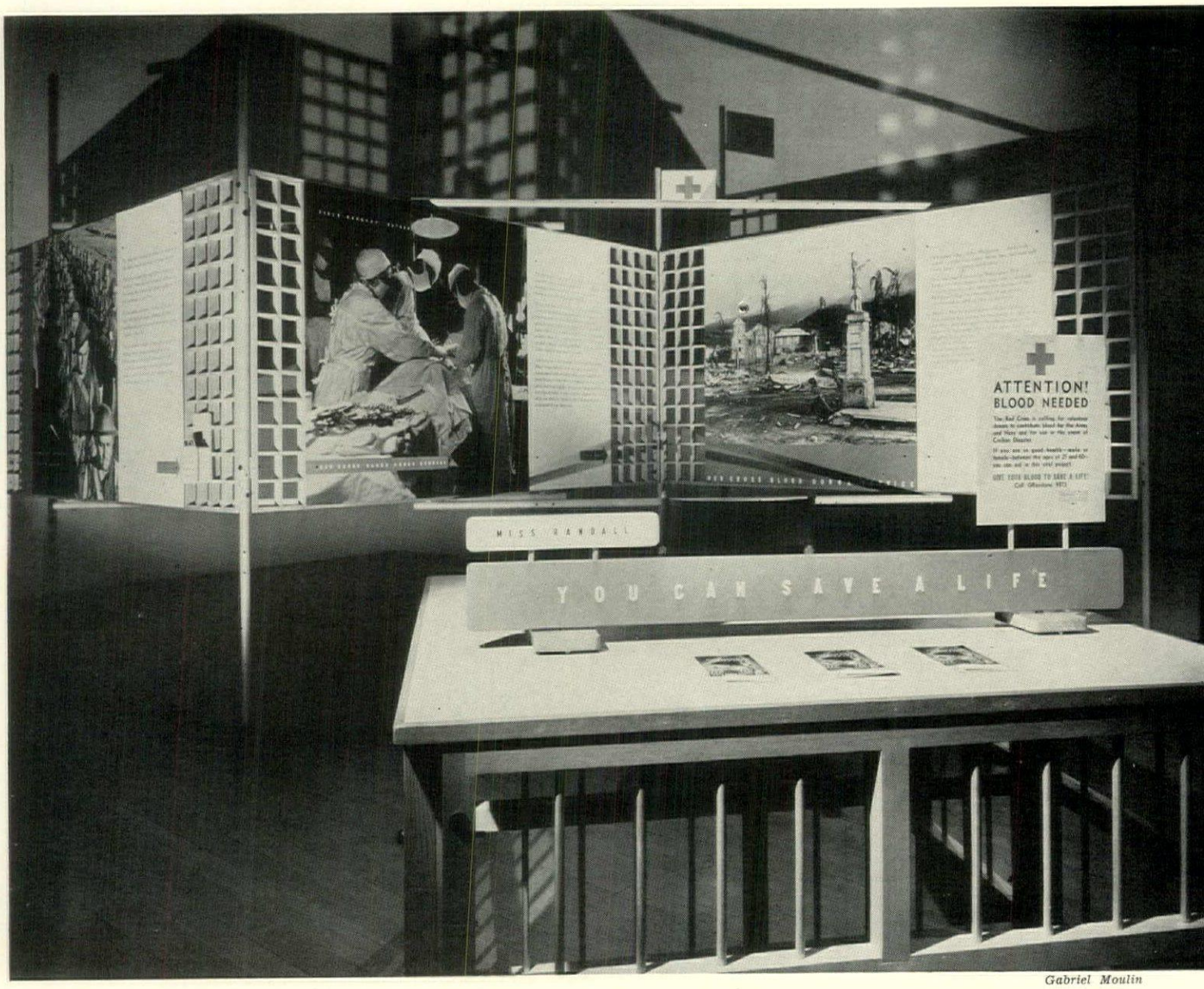
Multiple seating

12. Backrest



18. Picture stand, upright

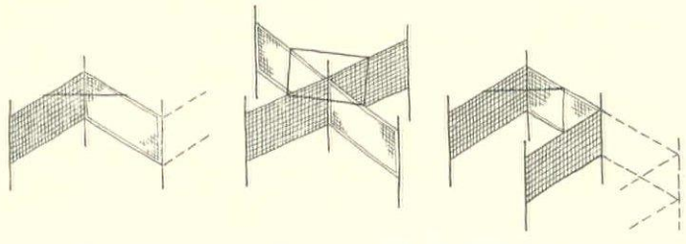
DISPLAY SCREENS ERNEST BORN, ARCHITECT



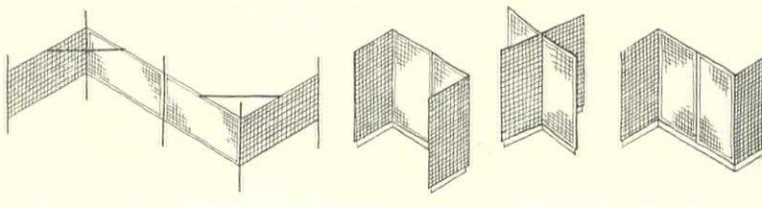
Gabriel Moulin

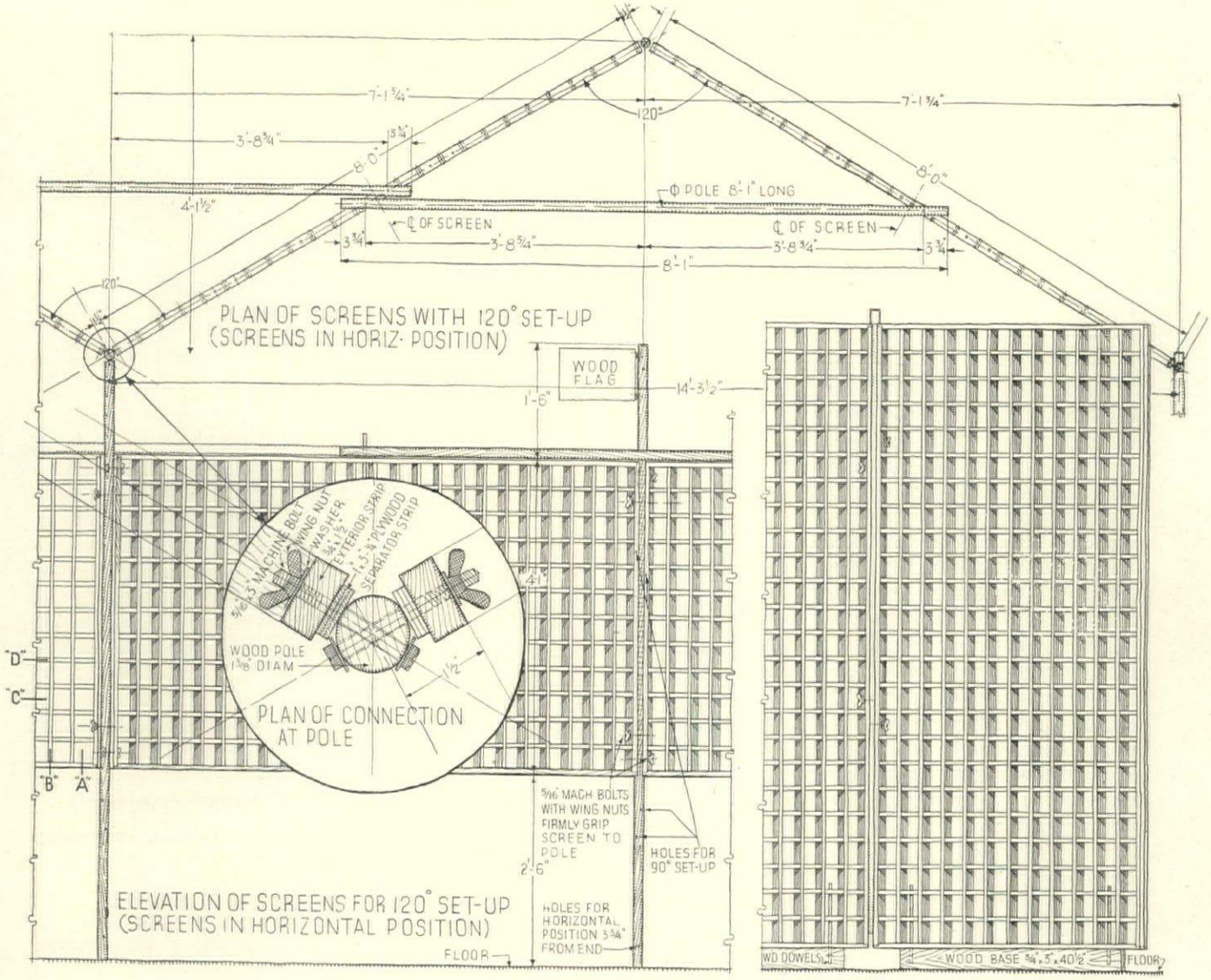
Basis of this exhibition for the Red Cross Blood Donor Service is an ingenious system of self-supporting screens which can be used in a variety of ways to support pictorial material of all types. Consisting of three standardized elements—open-grid panels, supporting poles (also used as braces) and sectional wood bases—the screens may be arranged either vertically or horizontally in an almost unlimited variety of patterns. Poles and braces are fastened to the panels with thumb screws, while the wood bases, used when the panels are set in the vertical position, are attached with long dowels. Assemblies can be set up rapidly and demounted repeatedly without damaging the units, which require little space for storage. The grid construction of the panels puts maximum emphasis on the exhibit material itself, tends to open the exhibit area, and facilitates connections. Cross-shaped inserts, held in place with dowels, are used to fill the openings in the grid at the corners of the displays and receive thumb tacks.

90° SETUP WITH SCREENS HORIZONTALLY

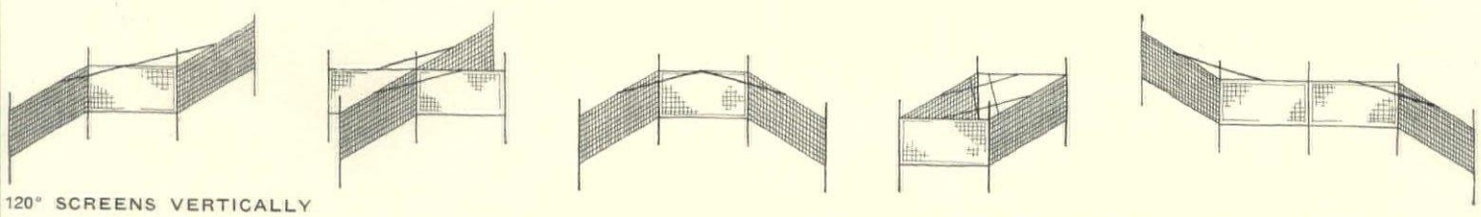


90° SCREENS VERTICALLY

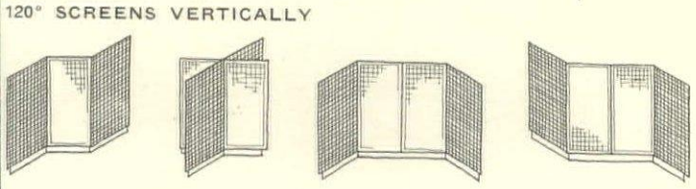




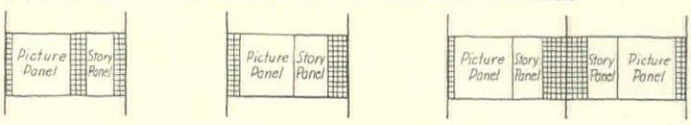
120° SETUP WITH SCREENS HORIZONTALLY



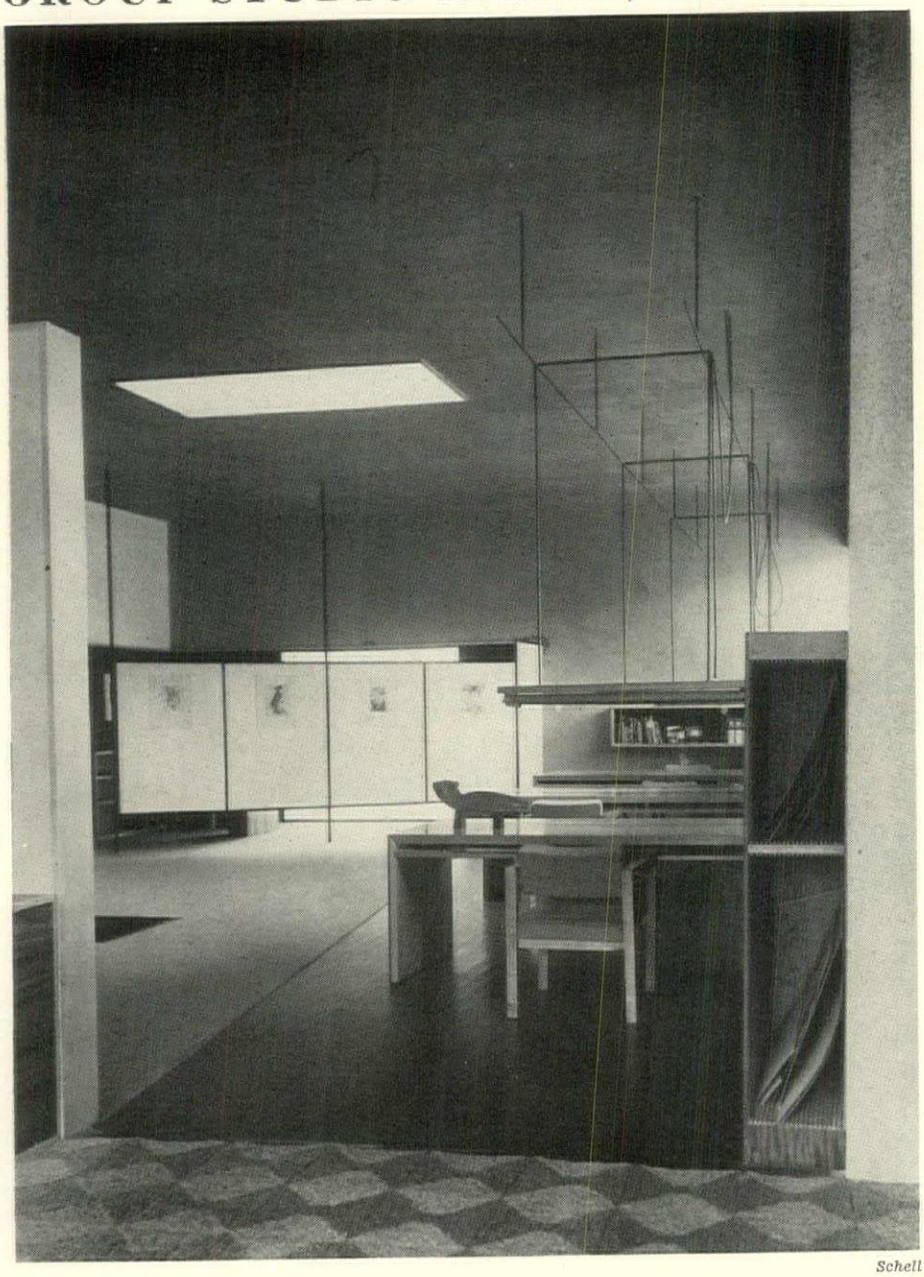
120° SCREENS VERTICALLY



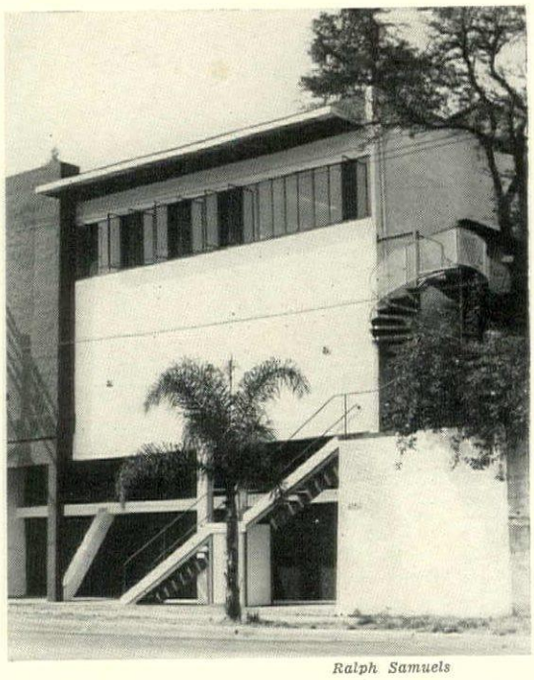
SUGGESTED ARRANGEMENTS OF DISPLAY PANELS



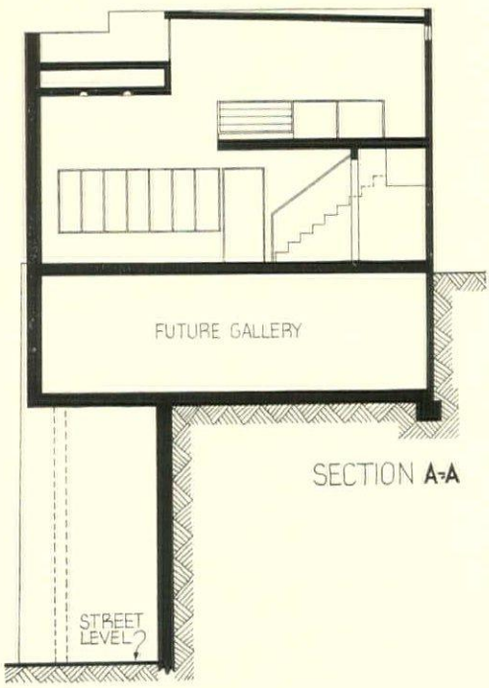
GROUP STUDIO LOS ANGELES, CALIF.



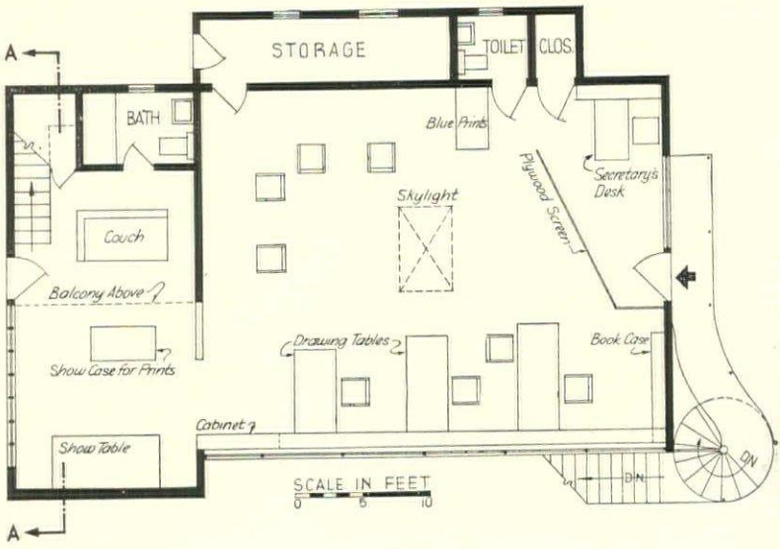
Schell

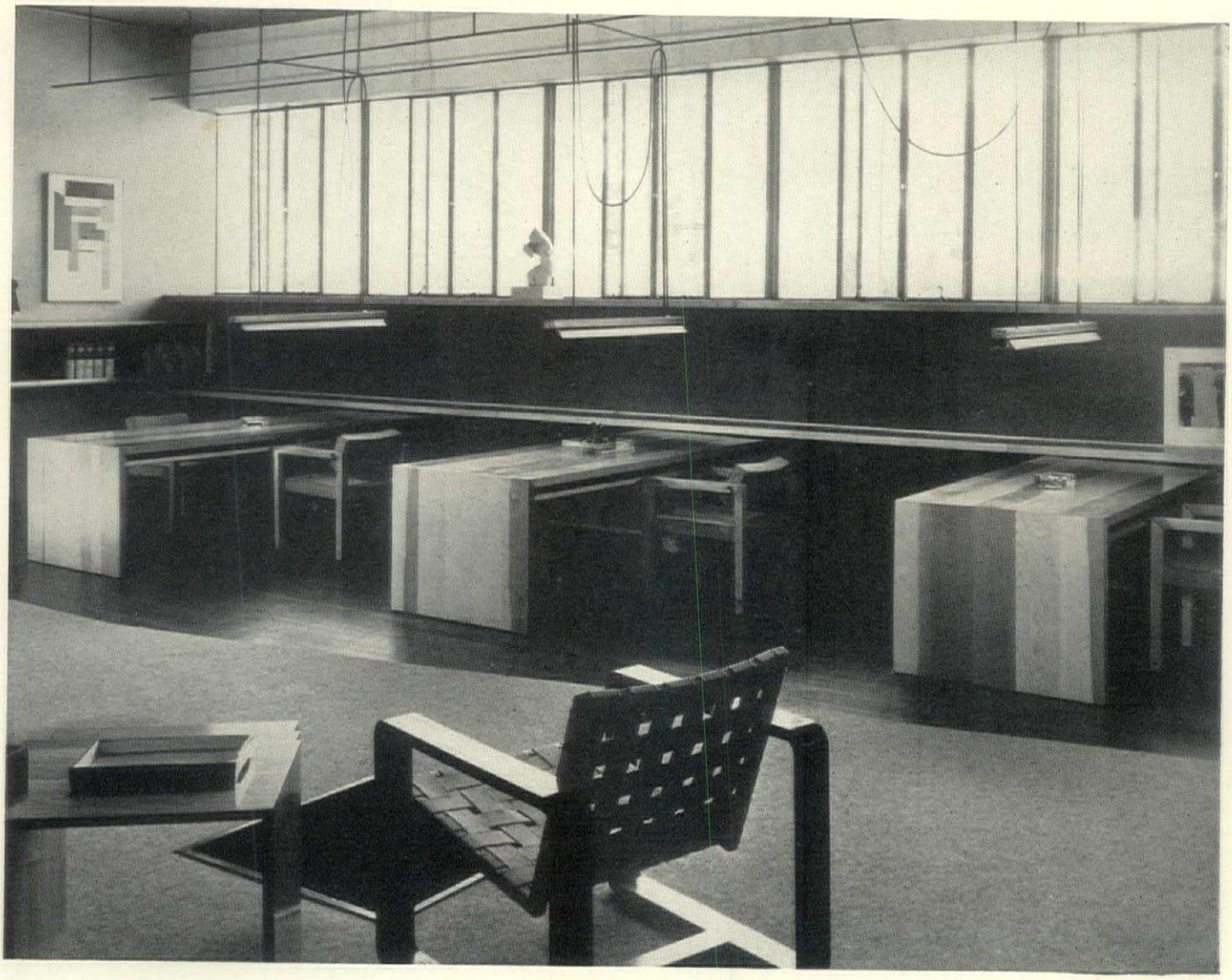


Ralph Samuels

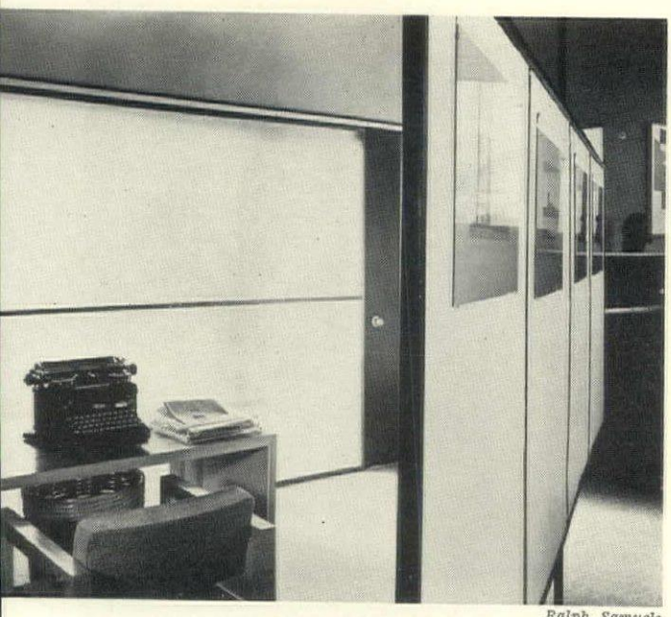


Hung on the side of a steep slope facing a busy Los Angeles street, this building was remodeled from a 1926 pseudo-Spanish villa to serve as a combined office, workroom and exhibition space for a group of designers and artists. The main studio level, 28 ft. above the street, is reached by a combination stairs extending in two straight runs across the front of the building, then rising in a free-standing spiral at one corner and ending in a short, curving ramp. A lower level, still to be remodeled, is reserved for a future gallery. Studio fittings are designed for maximum flexibility to meet the wide range of requirements of the group, which includes painters and sculptors as well as designers. Daylighting is by a long bank of windows facing north, shaded by a generous overhang, and by skylights and a row of clerestory windows for the balcony. Artificial illumination is mainly fluorescent.

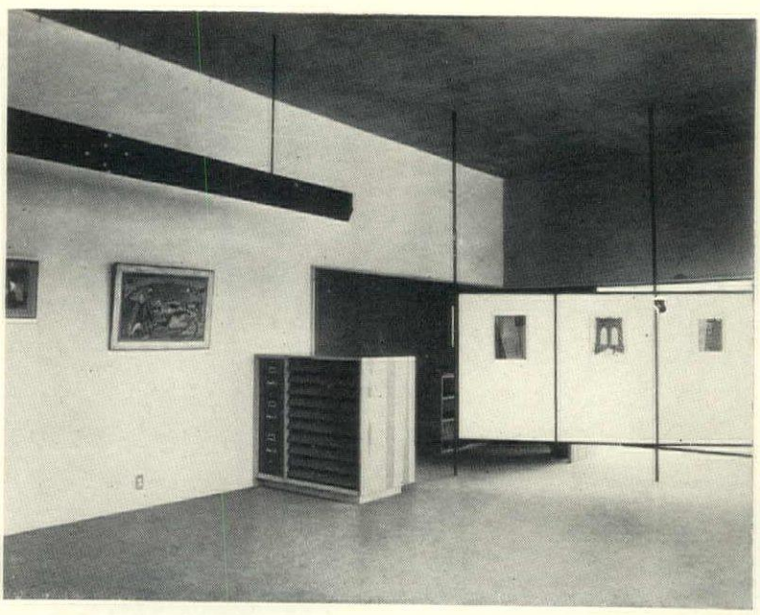




Ralph Samuels



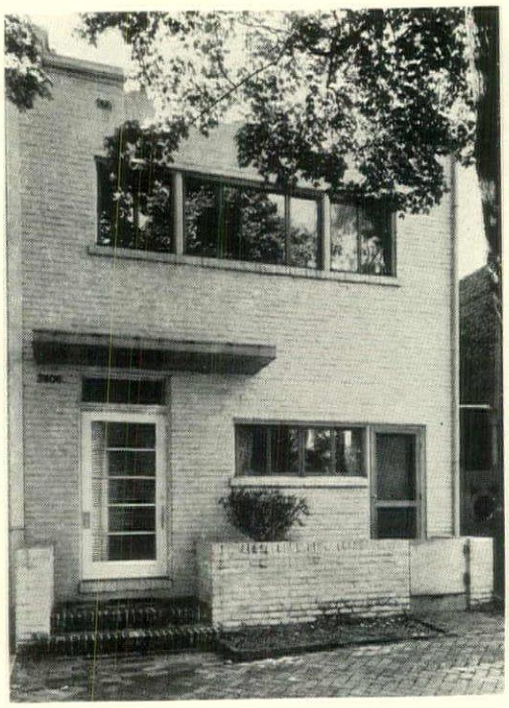
Ralph Samuels

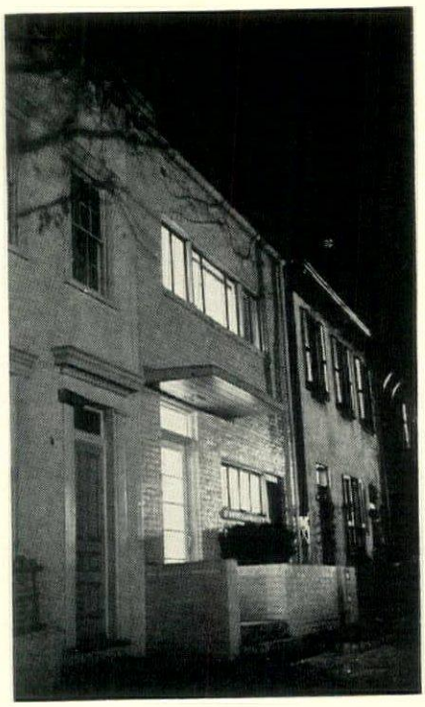


Schell

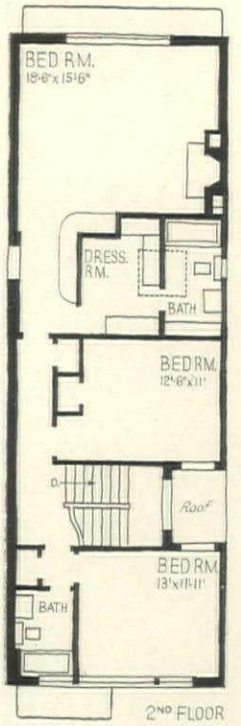
HOUSES

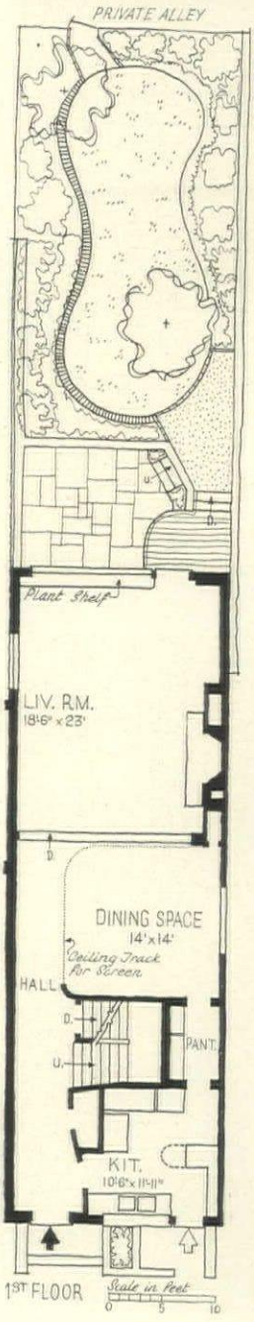
Photos, Horydczak





HOUSE IN WASHINGTON, D.C. DAVID NORTON YERKES, ARCHITECT

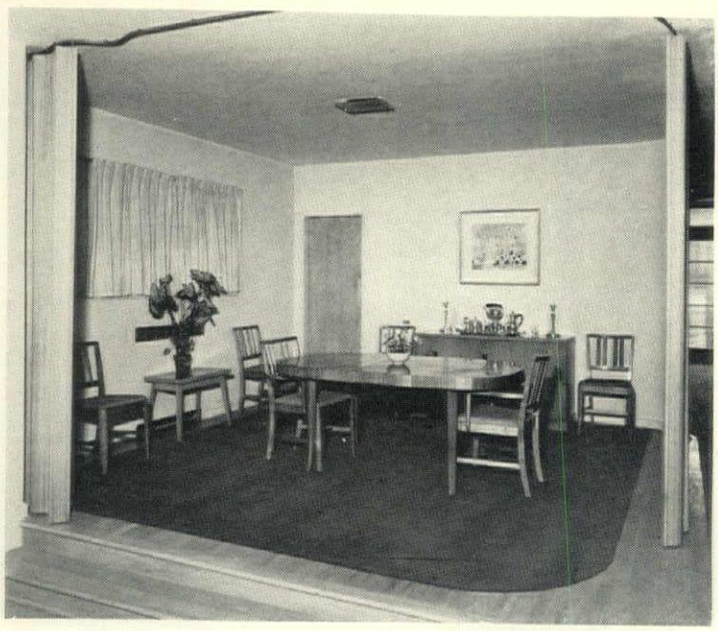




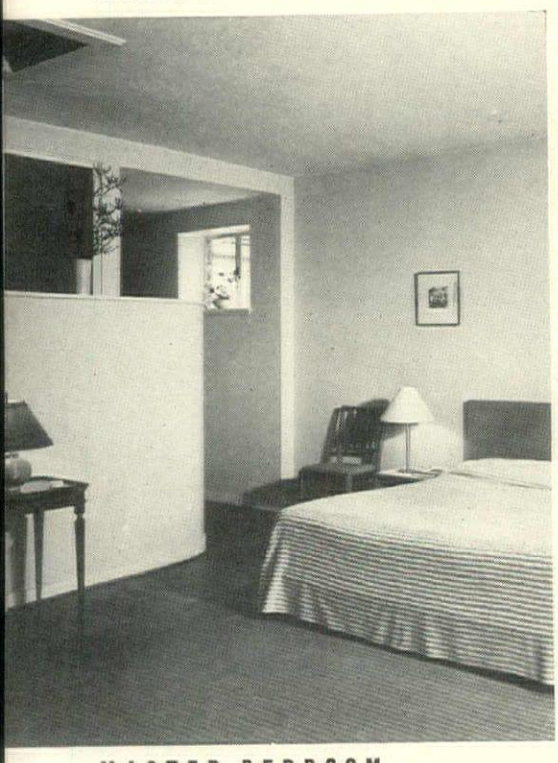
LIVING ROOM

Facing a busy thoroughfare on the north, this town house has its principal rooms at the back for privacy and better orientation. Room sizes are exceptionally generous in view of the 20 ft. overall width of the plot, and the plan open and excellently organized. The brick exterior was designed to conform with the Georgian character of the neighborhood while meeting contemporary aesthetic and practical requirements.

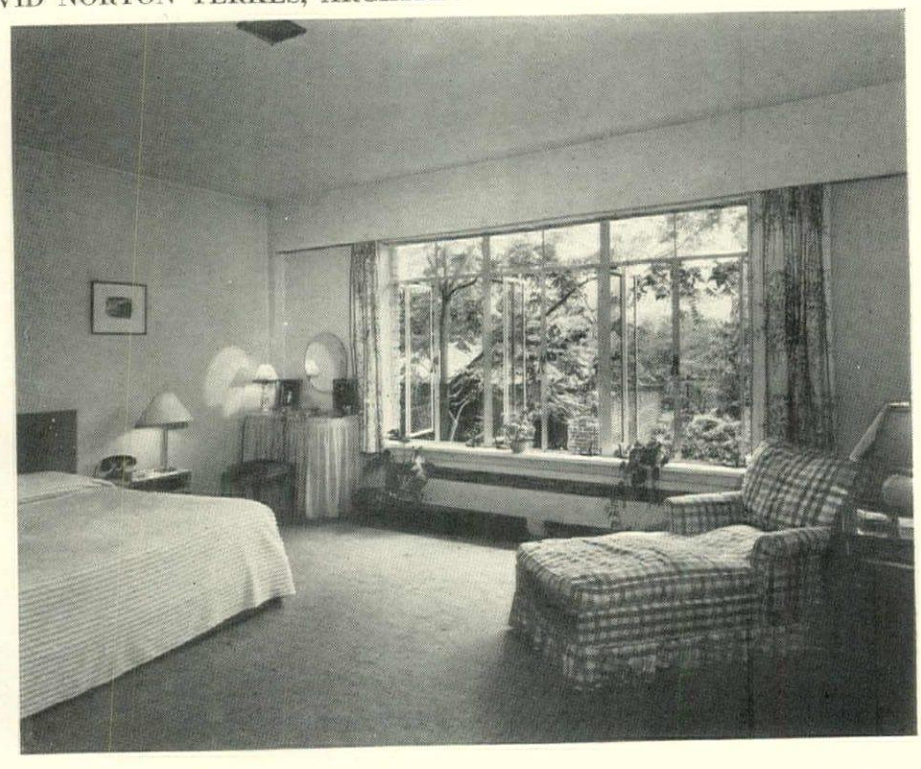
DINING ROOM



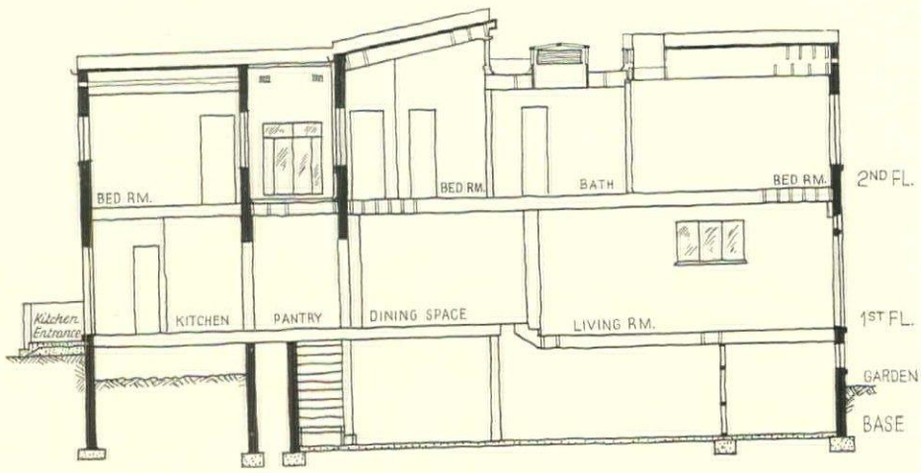
ENTRANCE



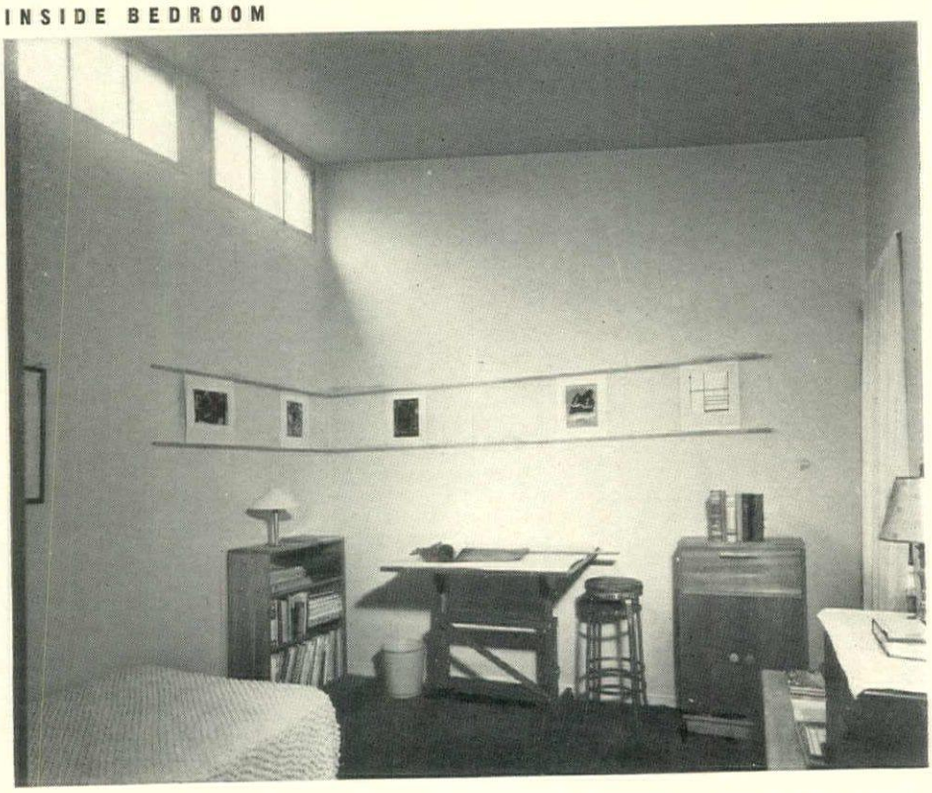
MASTER BEDROOM



Light and through-ventilation for the second-floor bedrooms have been achieved by an ingenious combination of the old-fashioned "light court"—which also serves to illuminate and decorate the inside stairway—and clerestory windows in the interior bedroom. This arrangement is shown in the longitudinal section at the right, as well as the use of the dropped living-room floor to provide additional ceiling height for this room. The cost of the house, which was completed in 1941, was approximately $14,000.



INSIDE BEDROOM

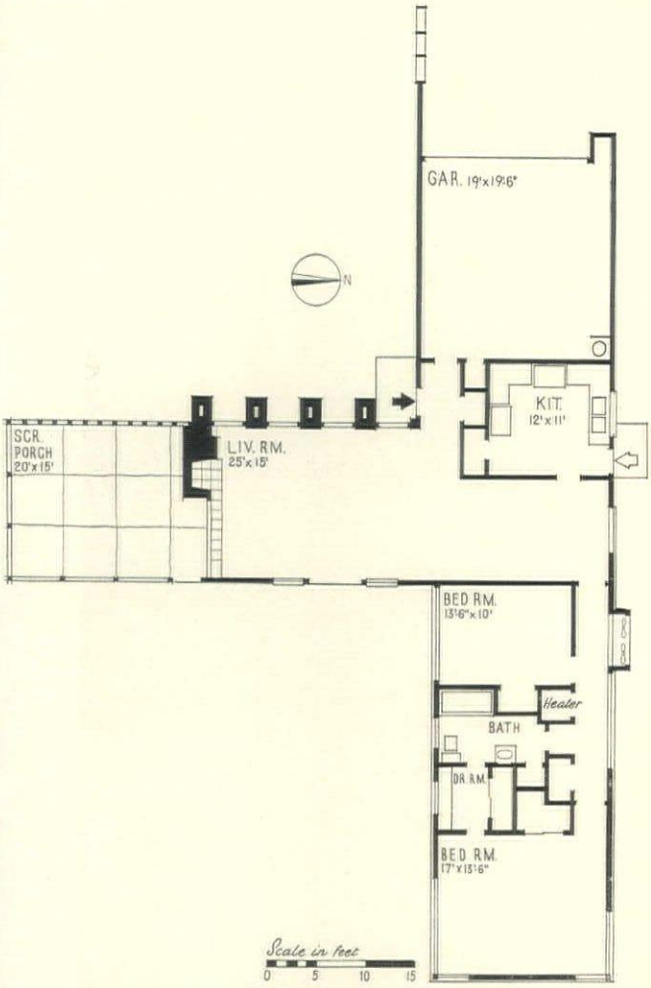


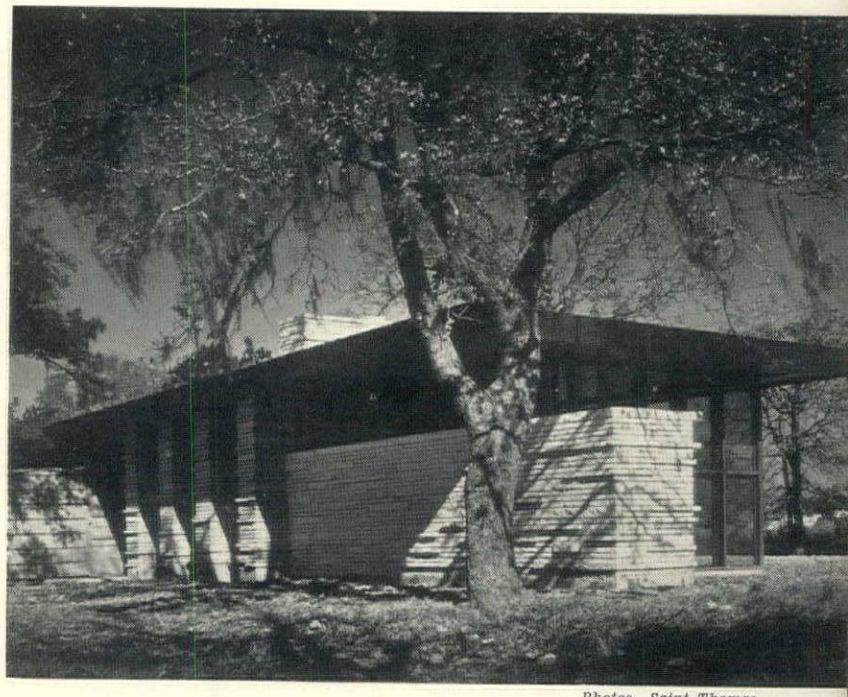
CONSTRUCTION OUTLINE

FOUNDATION: Waterproofing — Medusa Portland Cement Co.
STRUCTURE: Exterior walls—12 and 8 in. brick above 1st floor; Aquabar Co. dampproofing asphalt.
INSULATION: Roof—Philip Carey Mfg. Co.
FIREPLACE: Damper—Peerless Mfg. Corp.
WINDOWS: Sash and screens—Truscon Steel Co. Glass—double strength, quality B, and crystal Pittsburgh Plate Glass Co.
ATTIC STAIR: Sampson disappearing, Please Woodworking Co.
FLOOR COVERINGS: Kitchen—Armstrong Cork Co.
PAINTS: Sherwin-Williams Co.
HARDWARE: Russell & Erwin.
ELECTRICAL FIXTURES: Kurt Versen Co.
KITCHEN EQUIPMENT: Range—Magic Chef, American Stove Co. Refrigerator—Frigidaire Div., General Motors Corp.
BATHROOM EQUIPMENT: Crane Co. Cabinets—Hess Warming & Ventilating Co.
HEATING: Hot water system. Boiler—Kewanee Boiler Corp. Stoker—Auto-Heat Corp. Radiators and grilles—American Radiator Co. Thermostat—Minneapolis-Honeywell Regulator Co.

HOUSE IN HOUSTON, TEXAS

MACKIE & KAMRATH, ARCHITECTS





Photos, Saint-Thomas

Designed in an adaptation of the residential style developed by Frank Lloyd Wright, this house has an open, orderly plan with plenty of windows to provide the through-ventilation so important in the southwest. A large screened porch is shielded from the approach side by a wall of irregular stone slabs and protected from the midday sun by broad overhanging eaves.

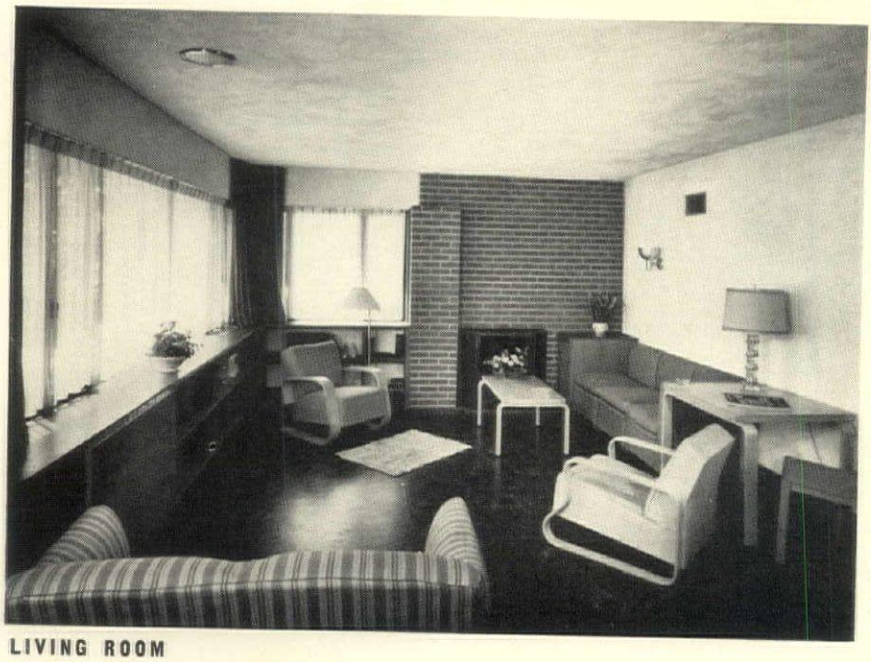
HOUSE IN CENTRALIA, ILL.

Photos, Bennett Tucker

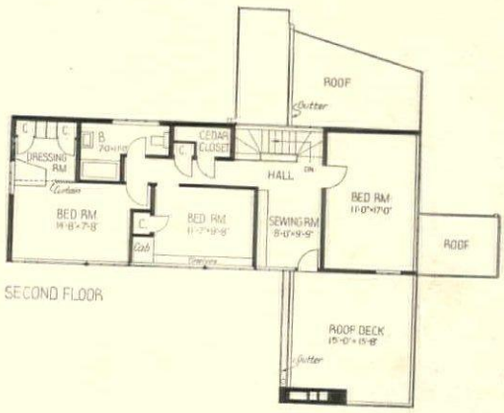
ENTRANCE SIDE

EAST ELEVATION

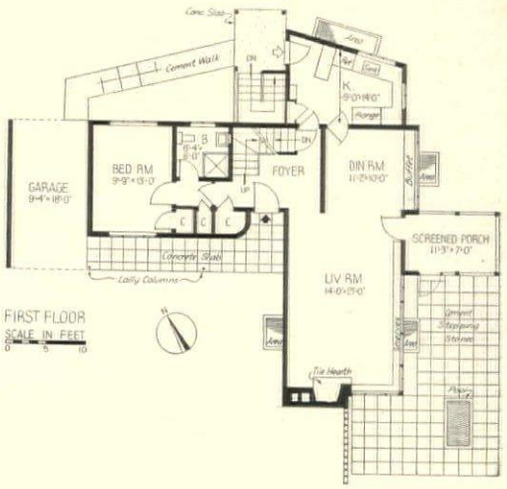
This medium-sized house has an excellent two-story plan and a number of ideas worth careful examination. Note particularly the way in which the carport has been integrated with the mass of the house, the sheltered passage between the carport and the entrance, the exceptionally fine lighting of the entrance-stair hall, and the interesting treatment of the screened porch. The splayed kitchen wall, an unusual feature, has the advantage of opening up the typical U-shaped arrangement of the fixtures and eliminating one of the awkward 90-degree corners. Exterior is redwood. Cubage: 26,437 cu. ft.; cost: $12,750 including architect's fee.



LIVING ROOM



SEWING ROOM



BEDROOM

CONSTRUCTION OUTLINE

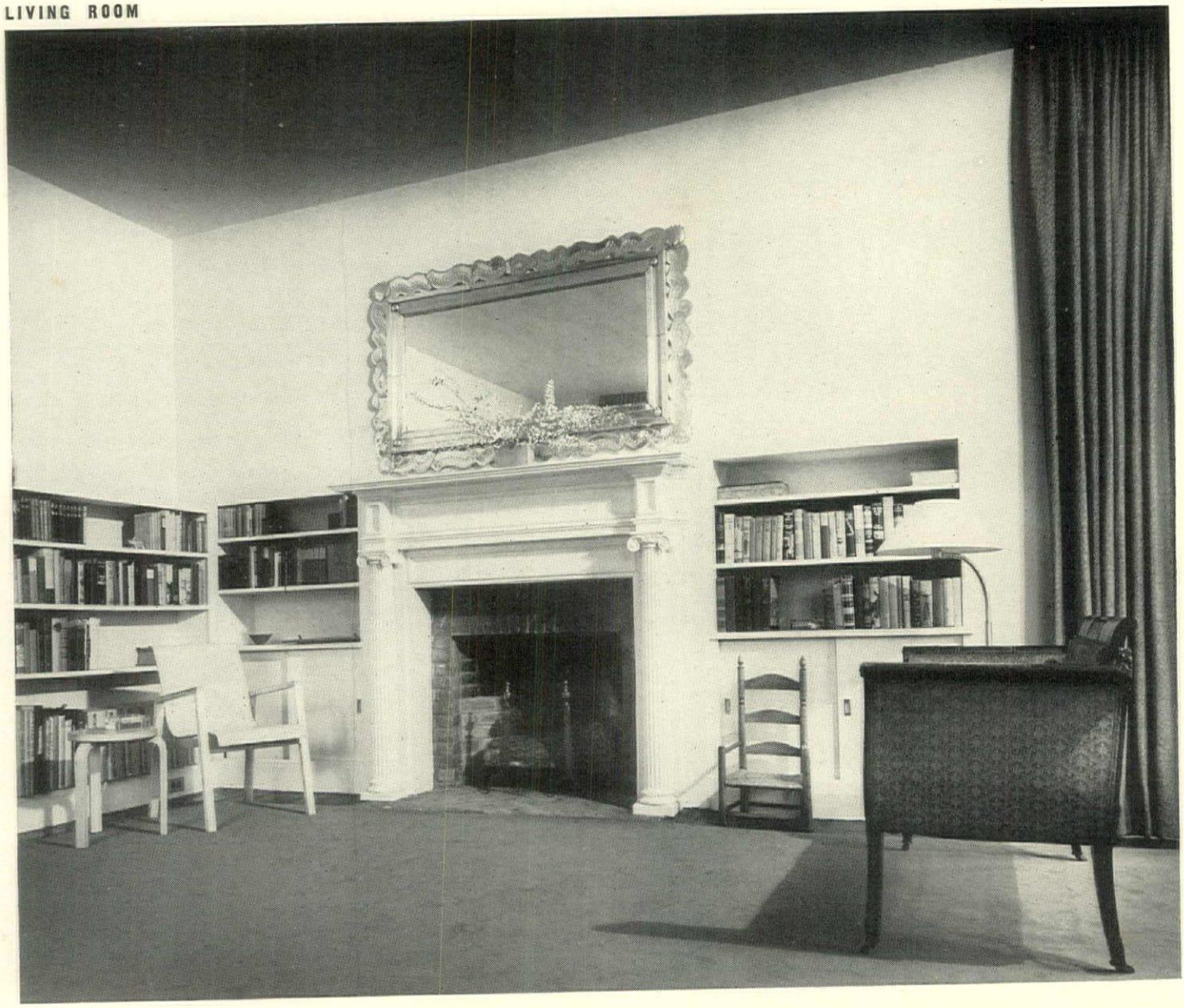
STRUCTURE: Exterior walls—Calif. redwood.
ROOF: Barber Asphalt Co. roofing. Deck—Canvas Top, Amalgamated Roofing Co.
FIREPLACE: Damper — Bennett Fireplace Co.
SHEET METAL WORK: Toncan metal, Republic Steel Co.
INSULATION: Roof—Balsam-Wool, Wood Conversion Co.
WINDOWS: Sash and screens—Hope's Windows, Inc. Glass—crystal sheet and double strength, quality B.
FLOOR COVERINGS: Linoleum throughout, Congoleum-Nairn, Inc.
DOORS: Huttig Sash & Door Co.
HARDWARE: Schlage Lock Co.
PAINTS: Sherwin-Williams Co. and Pratt & Lambert, Inc.
ELECTRICAL INSTALLATION: Switches—Hart & Hegeman. Fixtures—Architectural Bronze Studios.
KITCHEN EQUIPMENT: Range—General Electric Co. Refrigerator—Norge Div., Borg-Warner Corp. Sink—Eljer Mfg. Co. Cabinets—Huttig Sash & Door Co.
BATHROOM EQUIPMENT: Briggs Beautyware, Briggs Mfg. Co.
PLUMBING: Soil pipes—Central Foundry Co. Water pipes—copper, Mueller Brass Co.
HEATING: Warm air system, Sunbeam, Fox Furnace Co. Grilles—Air Controls Products Co. Thermostat—American Radiator-Standard Sanitary Corp. Water heater—General Electric Co.

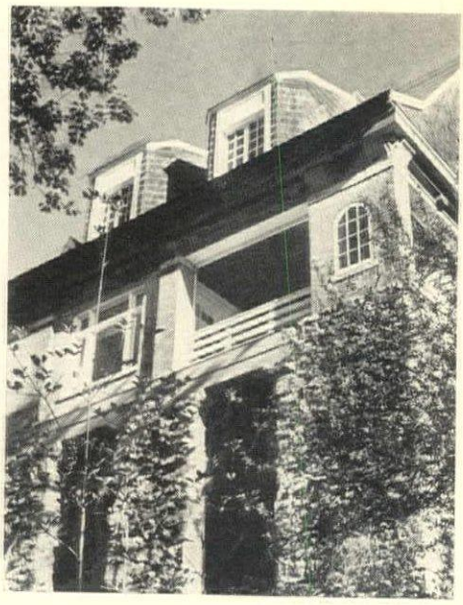
REMODELED HOUSE IN BRONXVILLE, N. Y.

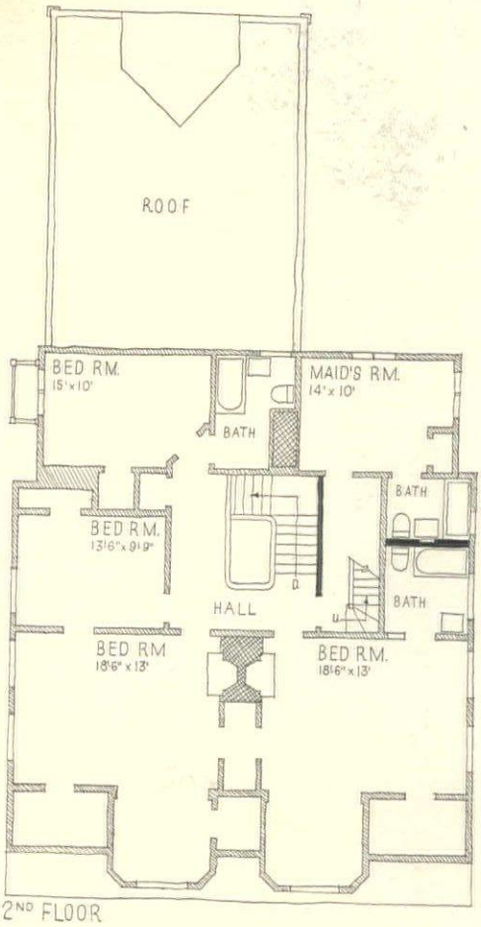
Built in 1897 when Bronxville, N. Y. was an artists' colony of a dozen houses, this house was considered unsaleable in 1942 when it was taken over by the architect and modernized for his own use. Principal structural alterations included extending the living room to include a portion of the porch, closing the doorways to the dining room which flanked the living-room fireplace (picture below), a new partition to reduce the size of the kitchen and create a rear service hall, and division of a large upstairs bath into two baths, one serving the maid's room. Also, the old, winding stairway was torn out and replaced, and a new partition of corrugated glass built between the stairhall and the pantry to light the back of the hall. The existing studio, which was left unchanged, is used in summer as a work-room and recreation room, closed in winter to conserve heat. Only alterations in the exterior were the removal of the peaked roofs of the dormers and provision of new entrance steps. A suspended ceiling was added in the living room to conceal the existing exposed beams and provide space for recessed curtain tracks.

Photos, Richard Garrison

LIVING ROOM

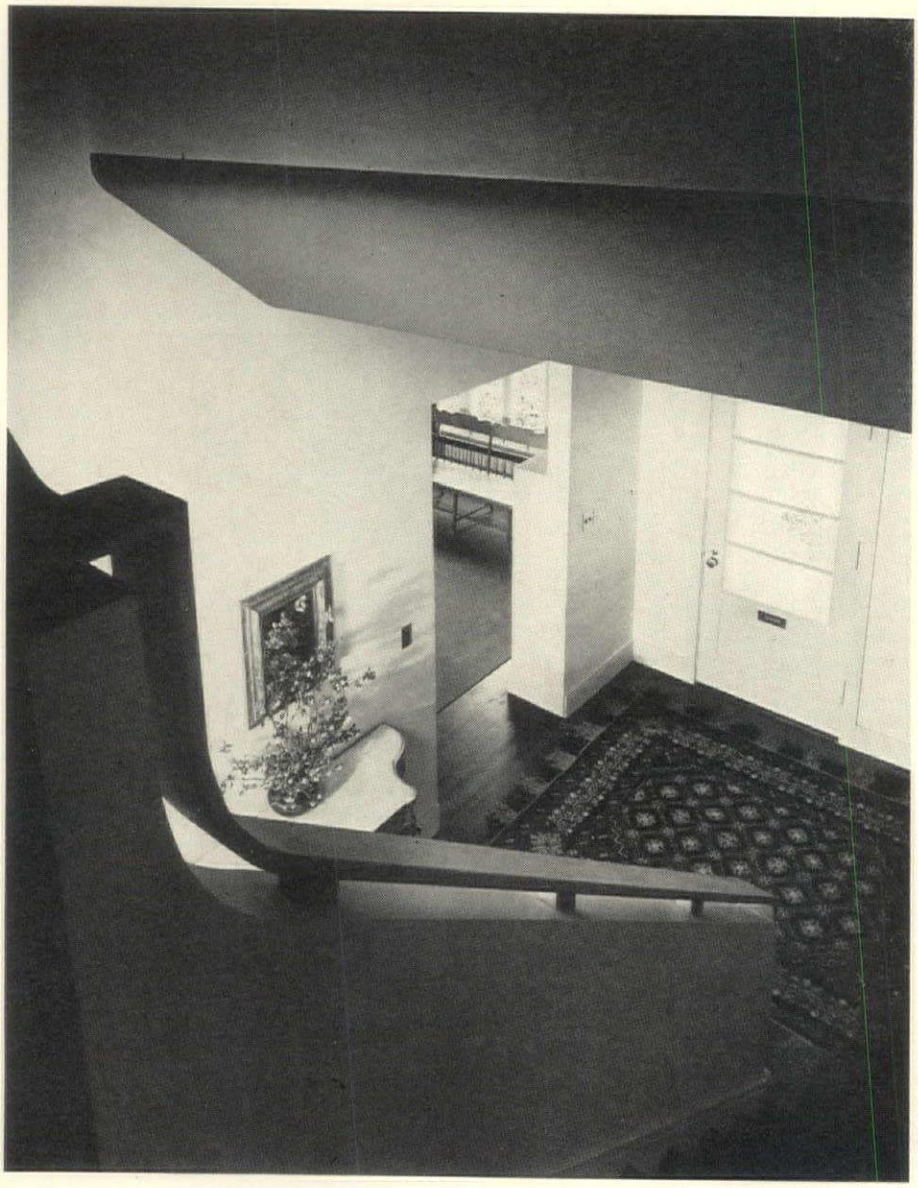


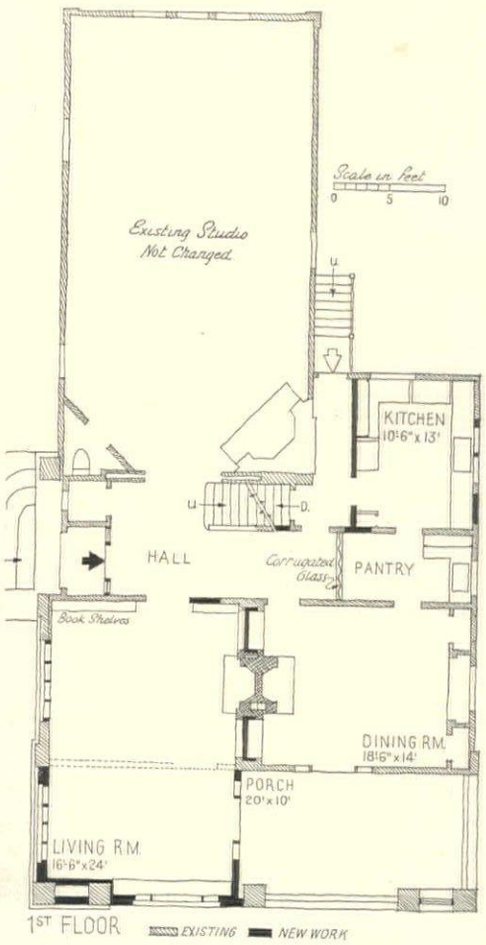




2ND FLOOR

ENTRANCE HALL





1ST FLOOR EXISTING NEW WORK

LIVING ROOM

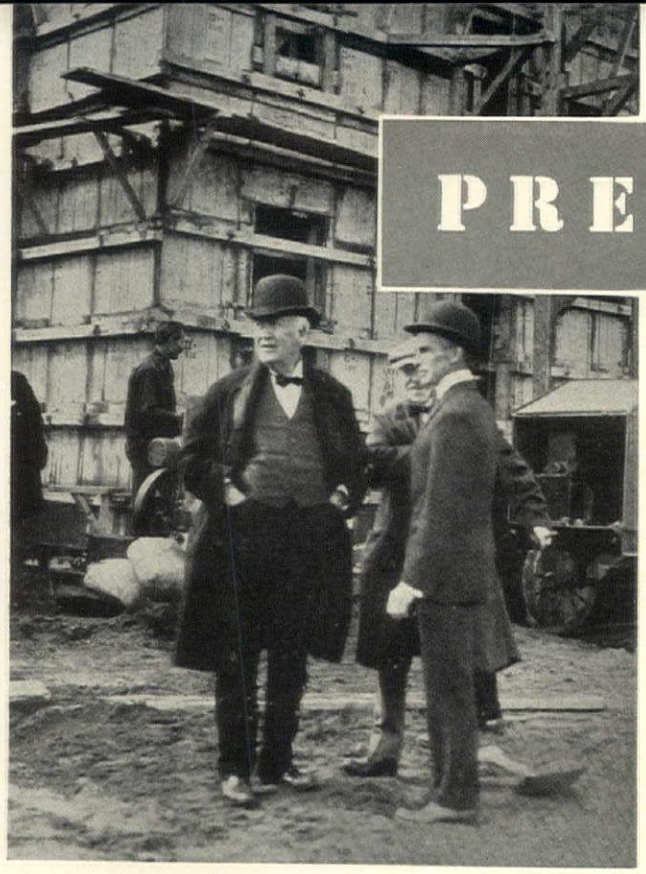
DINING ROOM

PETER SCHLADERMUNDT, ARCHITECT

CONSTRUCTION OUTLINE

SHEET METAL WORK: Leaders—copper, Revere Copper & Brass, Inc.
WINDOWS: Glass—Pittsburgh Plate Glass Co. Weatherstripping—Chamberlin Metal Weather Strip Co.
FLOOR COVERINGS: Main rooms—red oak, E. L. Bruce Co. Kitchen and bathrooms—linoleum, Armstrong Cork Co.
PAINTS: U. S. Gypsum Co., Devoe & Reynolds Co., Inc. Samuel Cabot, Inc., Socony Vacuum Paint Products Co.
WOODWORK: Morgan Sash & Door Co.
HARDWARE: Schlage Lock Co.
ELECTRICAL INSTALLATION: Wiring and switches —General Electric Co. Fixtures—Kurt Versen Co.
KITCHEN EQUIPMENT: Refrigerator—General Electric Co. Cabinet—Morgan Sash & Door Co.
BATHROOM EQUIPMENT: American Radiator-Standard Sanitary Corp. Cabinets—Charles Parker Co.
PLUMBING: Water pipes—Revere Copper & Brass Co.
HEATING AND AIR CONDITIONING: Warm air system with self-contained, oil-fired heat generator and air conditioner, blower and summer cooling, Holland Furnace Co.

PREFABRICATION



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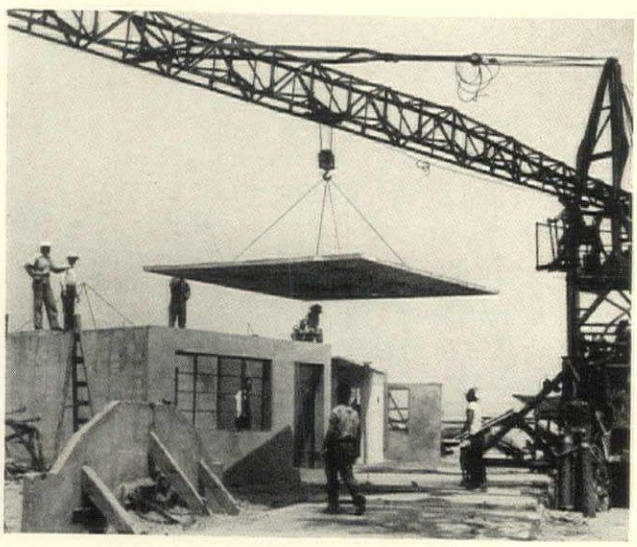


2.

Eisenstaedt—Pix

3.

To inauguarate this new department, THE FORUM is presenting a series of six articles on the history of prefabrication in America, based upon original research by the John B. Pierce Foundation. The first article in the series, entitled "A Movement Emerges," appeared in the December issue. Tracing the beginning of prefabrication as a widespread movement to the extensive publicity for proposed factory-produced houses in the early Thirties, this article reviewed the contributions of non-profit foundations and Government agencies such as the Forest Products Laboratory, the Purdue Research Foundation, the Bemis Foundation, John B. Pierce Foundation and other organizations which have exercised a continuous influence on its subsequent development. The second article, published last month under the heading: "Ideas—the Stimulus to Change," covered various radical proposals for "mast" houses, "eggshell" houses, the "mechanical core" etc., which were the initial impetus behind many prefabrication developments and have in certain instances suggested practical solutions of prefabrication problems. The third article, "Concrete—Forerunner to the Movement," appears below.

THE PREFABRICATED HOUSE

1. A MOVEMENT EMERGES
   published December 1942

2. IDEAS
   published January 1943

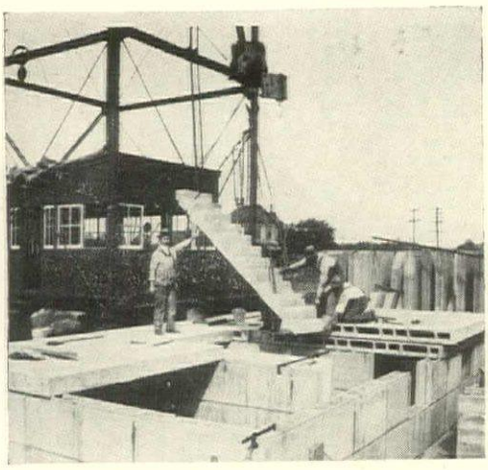
3. CONCRETE
   forerunner to the movement

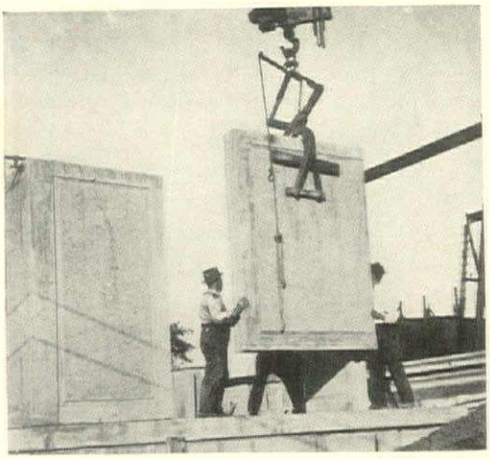
4. STEEL
   prominent in early experiments

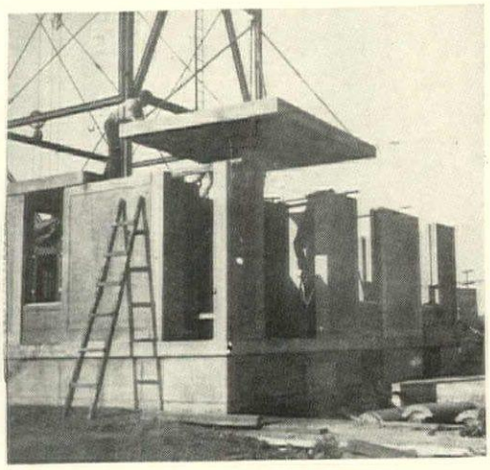
5. WOOD
   material of realization

6. "REENGINEERING"
   the measure of progress

1. Thomas A. Edison and Henry Ford inspect Edison's early experiment in poured-in-place, monolithic concrete construction, 1908. **2.** Use of precast slabs for low-cost housing by Whaley Construction Co., (Econo-Crete system), Long Beach, Calif., 1941. **3.** Wallace Neff's concrete "bubble house," built by spraying concrete over an inflated rubber form, Falls Church, Va., 1941.







Free standing house built of precast concrete units developed by Grosvenor Atterbury, Architect, Forest Hills, L. I., 1910.

3. CONCRETE—forerunner to the movement

THE PRIMARY AIM of prefabrication—to put house production on an industrial basis—is almost as old as industrialization itself. The 19th century English Utopians, first to recognize the potentially vast productivity unleashed by the Industrial Revolution, were its earliest proponents. They noted the contrast—already apparent in their time—between the handicraft methods used in building and the efficient, mass-production techniques developing elsewhere. For their ideal machine-age cities, they proposed that buildings be constructed from standardized, factory-made sections of cast iron.

In suggesting this rather inappropriate material, the Utopians were merely indulging in the same kind of thinking that causes their latter-day prototypes to wax enthusiastic over the possibility of a postwar house built entirely of plastics. Cast iron was then the prime machine-age material, the foundry the seat of mass production. Ergo, if housing was to be put on a mass-production basis, this could best be done by employing this versatile and glamorous material. The thought that its high heat conductivity and heat capacity, its great weight, its high cost per pound and imperfect resistance to the elements made its utility for such a purpose more than doubtful probably never entered their heads. Cast iron products were coming out of the foundries in a never-ending stream. Intricate patterns were being reproduced thousands and thousands of times by a process which required little skill, and cost only slightly more than the material consumed. Industry had seemingly discovered a method of reproduction almost natural in its simplicity. What could be more appropriate than to apply this process to the reproduction of building parts, heretofore so tediously assembled?

Actually, of course, cast iron never got much further as a building material than its use for ornamentation and for certain limited structural purposes. A glorious, but isolated exception was the London Crystal Palace (1851)—the first, and still virtually the only large-scale building project to be carried out by mass-production methods. In most instances, however, the use of cast iron, while it exploited the principle of foundry production, applied this principle mostly to nonessential geegaws that might have been omitted altogether. The idea of cast building parts—wall, floor and roof panels and the like—had to await a more suitable material. That material was not long in coming. It was concrete.

Like cast iron, concrete could be poured into molds where it would harden into strong, rigid sections of almost any required size and configuration with the expenditure of little labor. The process was, in fact, simpler than that used in casting iron, since heat was not required and the mold did not have to be broken up and reformed from a pattern for every section cast. Also, while it shared to a degree cast iron's disadvantages of high weight and heat conductivity, it was cheap, everywhere available and highly weather-resistant.

Shortly after the beginning of the present century, these facts led a number of experimenters to attempt the construction of concrete houses, both here and abroad. Employing either sections cast at the factory and trucked to the building site, or cast in place in movable, prefabricated forms which could be used to produce almost any number of houses, these experiments were conscious attempts to apply the technique of industrial production to housing, and were so described by their originators. Such experiments have continued ever since, and have been frequently quite successful—even highly successful—both in terms of lowered cost (as com-

pared with other forms of low-maintenance, fire-resistant construction) and of the quality of the buildings produced. All told, there are probably thousands of houses and other buildings in the U. S., built, lived in and, in some instances, tested in actual use for periods of 25 years, constructed by one or another type of prefabricated concrete construction. Many such systems have been used only once, for a single house or a single development. A few have been responsible for hundreds of houses, and have remained in use to the present time. A vast reservoir of experience has been accumulated, which, if it has yet to produce a steady, substantial flow of development sufficient to guarantee this type of prefabrication a permanent, important place in the national building scheme, at any rate, entitles it to equal status with any of the other methods so far used. And the story of prefabrication in concrete, from its beginnings in the prehistory of the prefabrication movement, is important for the principles it illustrates, the difficulties it reveals and the very real progress it has shown.

EARLY EXPERIMENTS

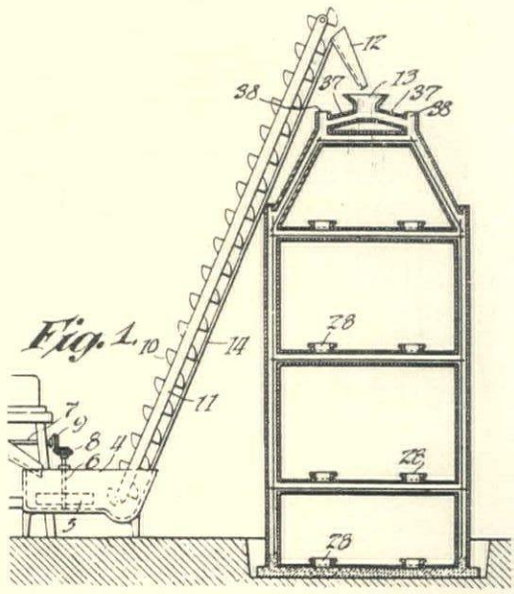
Thomas Alvah Edison, who in 1908 sought to develop a system of inexpensive concrete construction, is generally credited with originating the idea of the mass-produced concrete house. Actually, there were already several such systems in use in Europe at the time Edison began his experiments, and at least one other inventor, Architect Grosvenor Atterbury, had been working on still another in the U. S. for about a year. Edison's attempt, however, attracted widespread attention because of the prominence of its sponsor, and has remained in most minds to date the beginning of prefabrication in the U. S.

Edison's method, as projected and actually tried out in a modified version, involved the use of elaborate forms and machinery to make possible the pouring of a two-, or even three-story house in a single operation, including even a concrete bathtub. Sectional, cast-iron forms, bolted together through their reenforcing flanges, were to be assembled on the foundation walls to the entire height of the house, ending in a centrally located funnel into which the concrete was to be poured. This was to be connected to various parts of the structure by distributing pipes or troughs equipped with vents to prevent air pockets, and fed from a specially-designed concrete mixer equipped with an endless bucket conveyor reaching from the ground to the top of the house. A rapidly hardening concrete was to be poured slowly into the forms at such a rate that the lower portions would have a chance to harden before the concrete forming the upper part of the structure was in place, thus relieving hydraulic pressure on the forms.

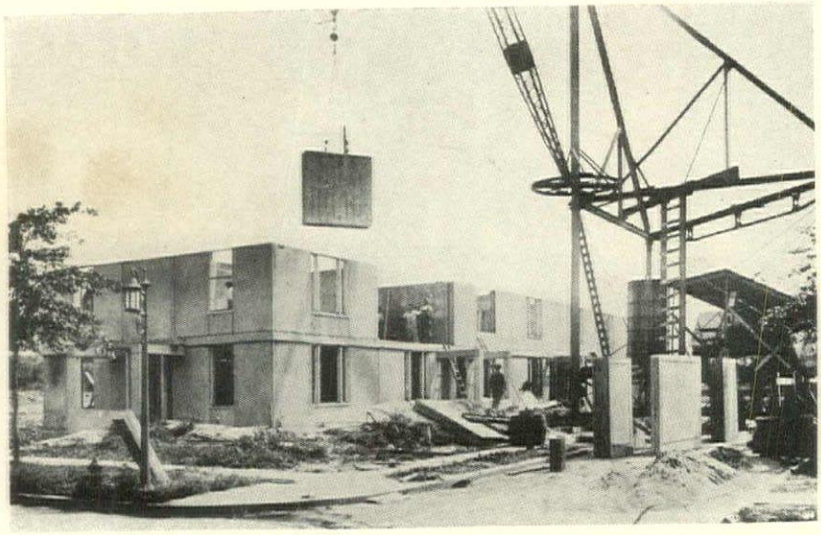
Walls, floors, ceiling and roof were to consist of solid concrete with reenforcing rods in both directions. In design, the houses followed the style of the period, which was expansive and ornate. Despite the attention these ideas attracted, they were tried only in a modified form using wood forms, and soon abandoned.

A year earlier Grosvenor Atterbury, a New York architect who had been interested in low-cost housing and improvements in house construction since 1902, built an experimental structure—little more than a hut—from hollow, precast concrete panels he had developed after a study of the use of precast concrete abroad. The Atterbury system, as later developed and used extensively at the Forest Hills, L. I., development of the Russell Sage Foundation, incorporated most of the refinements that have been applied to precast panel construction since, and is worthy of detailed description not only because of its early date, but because of the unusually high quality and low cost of the houses produced, and the practicability of the method developed.

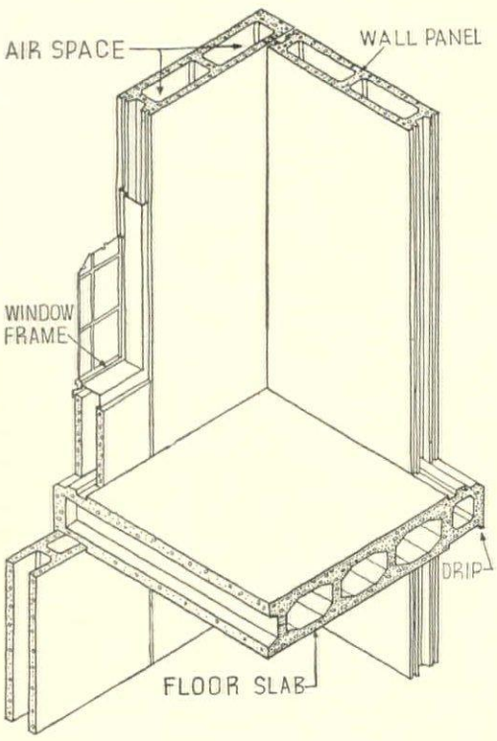
Grosvenor Atterbury, F.A.I.A., has been a practicing architect since 1895, and a practicing prefabricator for almost as long a period. A graduate of Yale University and Columbia University School of Architecture, he also studied at L'Ecole des Beaux Arts, Atelier Blondel. In 1908, he developed a system of construction using hollow-cored, precast concrete units. Between 1910 and 1918, he built several hundred houses by his method at Forest Hills Gardens, L. I., for the Russell Sage Foundation. Recently, Mr. Atterbury has worked out a number of important improvements in his system which permit much more rapid production of the concrete units and reduce the cost of the forms.



Patent drawing for Thomas A. Edison's proposed method of cast-in-place construction. Edison developed his system in an effort to utilize machinery which he had purchased for his attempt to revitalize New Jersey's abandoned iron mines, and which had been made valueless by the discovery of new iron deposits in Michigan. After it was determined that the cast-iron forms for the type of house he planned would cost $25,000, he gave up the scheme in favor of a more conventional method of construction using wooden forms.



Eight-family row unit built by the Atterbury system at Forest Hills in 1918. Pictures above show crane placing hollow, precast wall and roof units, picture on facing page completed houses. Ornamental porch roofs, chimney tops and entire dormer window sections were one-piece castings, factory-finished. Interior side of wall units had raised, decorative moldings (visible in the units standing near the crane in the first picture), and were painted with oil paint after erection. Exterior faces of the units were natural concrete.



RIBBED WALL

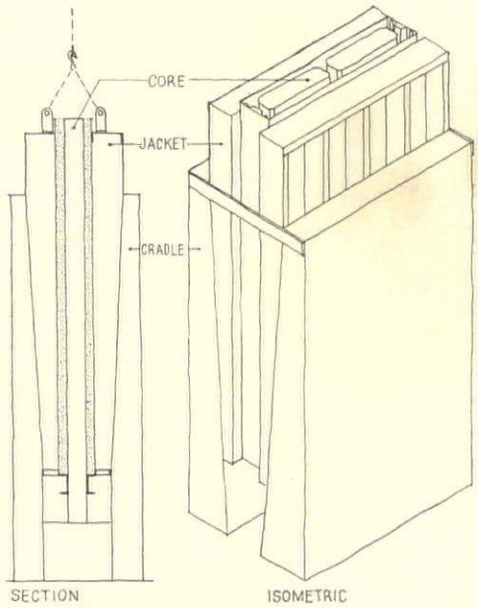
Isometric view of the Atterbury system of construction, showing how floor panels extend through the wall to lock the structure together. Windows were framed by adjoining wall units, installed on the job. Hollow-cored units were 9 in. thick, with 6 in. air space and two 1½ in. concrete membranes.

The Atterbury houses, built at Forest Hills Gardens between 1913 and 1918, consisted almost entirely of hollow-cored, precast elements, including walls, floors, roofs and even such features as chimneys, porches and dormer windows. The typical wall section, which was 8 ft. high and sufficiently wide to fill the entire space between each pair of windows, consisted of two 1½ in. concrete membranes separated by a 6 in. air space, forming a wall 9 in. in thickness. Stiffening ribs, also about 1½ in. thick, separated the two membranes and provided structural strength sufficient to support the floors, without the necessity for steel reenforcement. The surface of the concrete unit, as produced in the mold at the factory, provided both the exterior and the interior finish surfaces of the wall, even incorporating such features as panel moldings to "dress up" the interiors of the houses. Result was a wall unit consisting of a single, economical material, which was complete as soon as it was put in place, damp-proof, of reasonably low heat conductivity compared with other forms of construction then in use, and required virtually no maintenance.

Floor, ceiling and roof panels consisted of similar hollow-cored units. Floor panels extended out to the face of the wall to lock the structure together and provide a platform for the erection of the second-floor wall panels, and were cast with a surface of "nailcrete" to receive wood flooring. In some experiments, reenforcing was omitted from even the floor panels to simplify casting, and strength sufficient for spans up to 14 ft. achieved through increasing the overall depth of the hollow unit and adding to the thickness of its bottom membrane.

Joints between panels were grouted so as to connect the front and back faces of the units but leave a hollow space, corresponding to the voids in the panels, between. This prevented penetration of moisture through the wall at this point, since it was found that whatever moisture did soak through the outer membrane evaporated before making its way across the 6 in. studlike ribs. In order to provide an exit for any moisture running down the inside of the wall, weep holes were formed in the floor slabs projecting into the walls to conduct such moisture to the ground.

As in the case of the Edison houses, those at Forest Hills followed the general design trend of the time, with heavy overhangs and elaborate porch roofs, chimney pieces and other ornamental features—all factory-cast and repeated with suitable variations throughout the development. The Atterbury houses, however, were planned as low-cost housing, and were considerably smaller than those built by Edison, in some cases as narrow as 13 ft. All, or almost all, employed the attic space under the roof as finished space, thus utilizing the floor provided by the typical panel construction of the second-floor ceiling.



Improved casting apparatus, which Mr. Atterbury has recently developed, utilizes a light, inexpensive "jacket" supported in a cradle strong enough to resist the hydraulic pressure of the 8 ft. casting. Jacket can be removed after concrete has received its initial set, freeing cradle for another casting.

As finished construction, the houses were an unqualified success. Time has proved that the construction method provided a structure that was strong, trouble-free, livable and exceptionally durable—in every way equal, if not superior to the corresponding methods of masonry construction with which it can properly be compared. As a production technique it had the outstanding virtue of employing a single, economical material for the entire shell of the house, and using little more material per sq. ft. of wall than would a solid slab 3 in. in thickness. With other systems of precast concrete construction, it shared the disadvantage that the building units used were heavy and hard to transport and put in place, and that a huge investment in plant and equipment was required to produce relatively few panels, since each unit had to remain in one of the expensive molds for at least 24 hours. Neither of these disadvantages unduly penalized the system in its application to a large-scale operation such as Forest Hills Gardens, but they tended to prevent its further development for individual, free-standing houses for general use elsewhere, and the duplication of the experiment on other large-scale work. Recently, Mr. Atterbury has succeeded in perfecting and testing improvements in the production technique—including cheaper forms and a system of "cooking" the concrete so that the forms can be removed from their supporting cradles within a half hour—which he believes will increase the productivity of the typical panel plant forty-fold, decreasing its cost and increasing its portability, and substantially canceling both disadvantages.

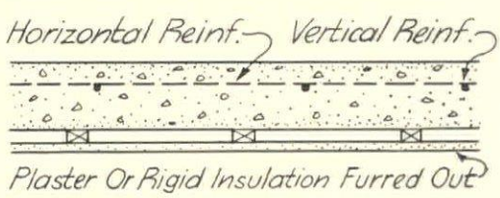
OTHER PRECAST SYSTEMS

Another inventor who used ribbed panels in a precast concrete system was Simon Lake, the submarine designer. Lake erected his first experimental house in 1918, using a thin concrete shell, with ribs resembling studding between the inner and outer wall surfaces. The panels were cast in sizes up to 10 x 30 ft., providing a complete wall for the average house in one piece. The outer shell or skin was only ¾ in. thick and the inner shell ½ in. thick with wire mesh reenforcing in both.

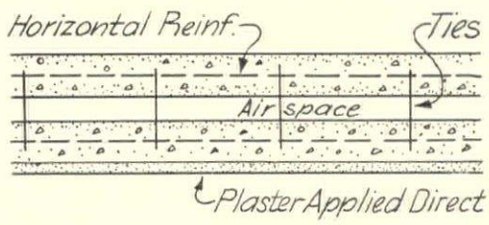
Wood forms used in casting the ribs were allowed to remain in the finished panel and in the center of each stud a strip of wood, fitted into grooves in the wood forms, was cast in place to provide an insulating material dividing the two faces of the wall. Door and window openings were included in the panels. Floor panels were similar to those used for the walls, with concrete joists and cross headers, and were covered with finished wood flooring.

In erection, wall panels extended the height of a single story for both one- and two-story structures and were mortared into grooves in the

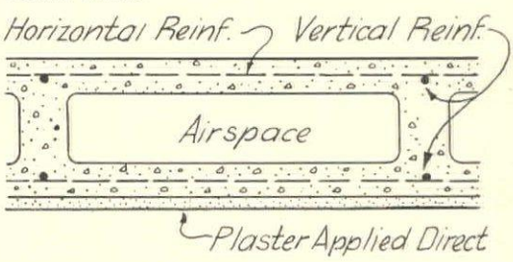
SOLID WALL



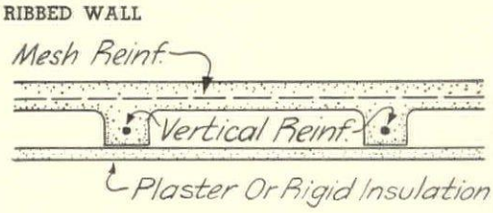
DOUBLE WALL



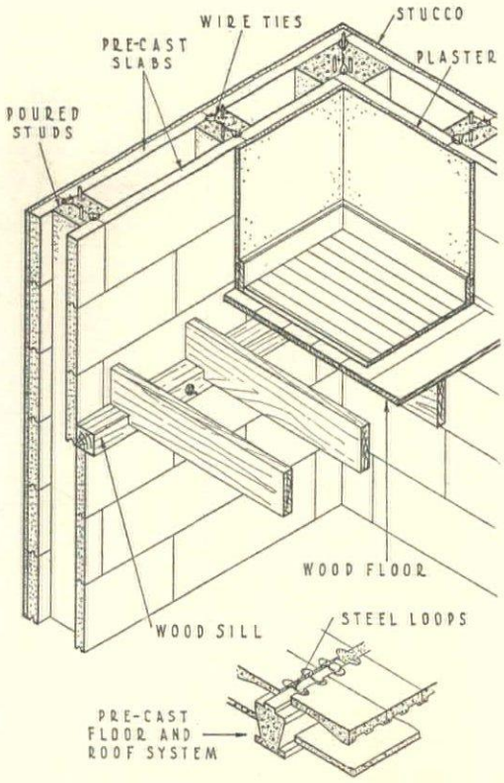
CORED WALL



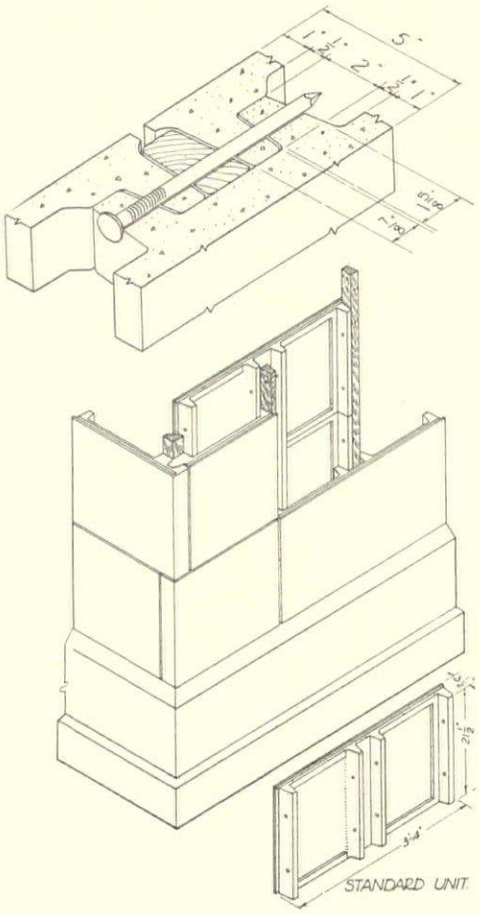
RIBBED WALL



Various basic types of concrete walls, used in both monolithic and precast construction, which are the basis of most of the systems of construction described in this chapter.



Above, Hahn system of construction from precast concrete "lumber," used in Illinois and Wisconsin in 1919. Below, Knapp Unit Wall construction, now being extensively employed in California.



floor units. The panels were delivered to the site on special flat cars and hoisted into position with derricks. A steam process was developed to cure the panels after casting.[1]

Both Lake and Atterbury had at their disposal considerable facilities for casting and transporting large, heavy sections, and therefore tended to develop construction systems that were beyond the means of the average builder. In most of the experimental work that followed, a conscious effort seems to have been made to work out systems consisting of smaller units which could be more easily handled, even at the expense of complicating the construction. The fact that much such experimentation was carried out on an individual basis made this inevitable, but it also meant that the systems thus developed could be duplicated on a small scale almost anywhere, and resulted in a period of widespread experimentation in which literally scores of systems, differing only in detail, were tried out.

As in the case of the Atterbury and Lake systems, some of these systems employ precast units to form both the exterior and the interior faces of the wall. Still others use the concrete sections only as an external shell and structural frame, and depend upon ordinary interior finishes attached to the inside of the supporting ribs. In the first category are a number of methods employing either separate, precast studs, studs cast in place after the two faces of the wall have been set up, or studs formed from the flanges and ribs of the precast panels.

Double-Wall Systems

One such system was that developed by Architect F. McM. Sawyer, in frank imitation of the wooden frame house. The Sawyer System[2] used concrete studs on 16 in. centers. Interior and exterior wall surfaces were made up of concrete slabs, cast 1¼ in. thick to resemble pieces of planking, 6 in. wide and 32 in. long. In erection, the plank-like slabs were set to join alternatively over every other stud and interlocked with precast sections that provided a form for the field-poured studs. The exterior surface was stuccoed and the interior was plastered. Hollow tile and concrete floors precast in 2 ft. squares were supported by reenforced concrete beams poured on the job.

In the Hahn Concrete Lumber System,[2] developed about 1919, a somewhat similar system was used, with studs 30 in. on center. Studs were 6 x 8 in. in size and resembled more the old post and girder framing of early Colonial houses than conventional framing of more recent use. The uprights were poured between collapsible wood forms after 12 x 30 in. slabs had been set in place and mortared together to form the exterior and interior sections of the wall. Slabs were connected and tied together with wires cast into each leaf. The roof and floor were carried on a bond beam, and either a wood-framed floor and ceiling or a concrete slab floor and ceiling could be used.

Another development of comparatively recent origin, the Knap System. Knap America, Inc., uses smaller horizontal flanged and ribbed slabs to form both exterior and interior portions of the wall. Units are about 20 in. high and 40 in. wide, and are interlocked with joints staggered both vertically and horizontally to form a double wall with studs 20 in. on centers. Developed in South Africa in 1931, this system was subsequently brought to the U. S. in 1938.

In erection, the flanges of adjoining exterior sections are slipped between the double ribs at the center of the interior slabs and vice versa. Between the adjoining flanges in this interlocking arrangement run separate uprights which act as vertical stiffeners. Pins run through holes cast into both the ribs, and the flanges are used to hold the units together. In the horizontal joints, the slabs are rabbeted to provide space for a

[1]Construction systems of a similar type were developed by R. C. Lafferty and the Connecticut Pre-Cast Buildings Corp., later Twachtman Construction Co. (B.M.S. Report #20).

grouted joint, and the rabbeted edge of the lowest course rests on a flange in the foundation wall. Waterproof paper linings of the units isolate the two faces of the wall. Floors are of conventional construction.

Single-Wall, "T-Beam" And Ribbed Units

Many of the precast systems, in the effort to reduce the size of the units to be handled on the job, resulted in rather complicated construction. The simplicity of the original, one-piece Atterbury unit had been lost in this attempt, and with it, much of the reason for employing separate concrete membrane for interior finish. In recognition of this fact, a number of inventors developed systems where concrete was used to form only the external surface and framework of the wall, with conventional types of interior finish applied at the site to the inside surface.

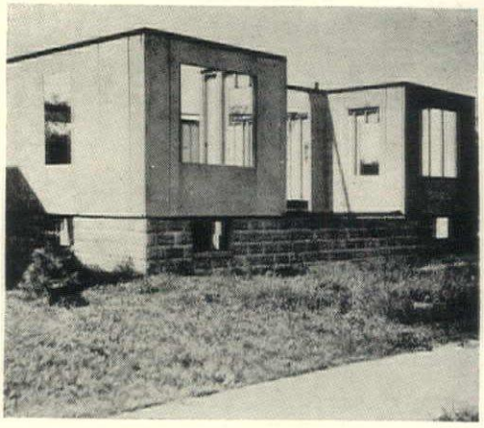
In the Simpson Craft system[2] developed by John T. Simpson, of Newark, N. J., single 40 in. wide precast wall slabs were used with 5 x 8 in. studs poured on the site. The slabs were in three sections to form a story-height wall with division lines coming at the top and bottom line of the windows. Both exterior and interior walls were mortared into grooves in lintel and sill courses consisting of precast concrete beams.

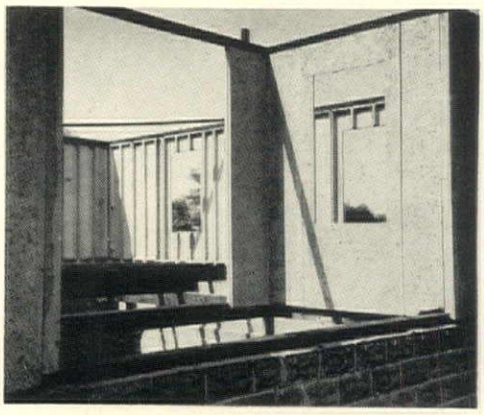
In a variation of the system, story-height slabs were used for an exterior wall, with the edges of the slabs cast into uprights as they were poured on the site. Protruding wires were cast into the studs to hold metal lath for a plaster interior finish. Floors, roofs and ceilings were frequently of conventional construction, but where concrete slabs were used for the interior wall, floors and ceilings could also be of slabs, and even roofs if desired. The floor slabs were set on concrete I-beams and ceiling slabs rested on the lower flanges of the beams.

In still another type of development, a studlike frame was incorporated as a unit with the wall surfacing, forming the supporting framework at the time of precasting. In the Moore Unit System,[2] developed in 1920 by the Texas Concrete Construction Co., channel shaped slabs 12 in. wide were placed side by side and mortared together. The adjoining flanges of the channels thus formed square, studlike supports on 12 in. centers. Wooden blocks cast into these flanges and furring strips nailed to the blocks supported lath and plaster or insulating board finish applied on the site. A continuous concrete girt or belt course bound the slabs together at floor and roof levels. Floors were of wood.

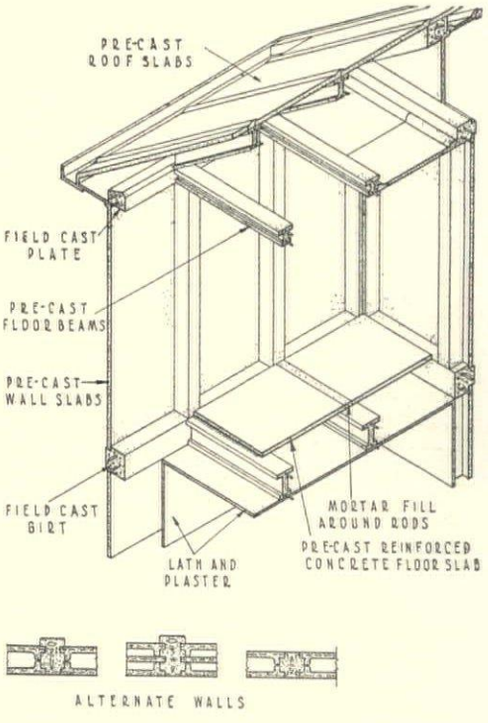
In the T-Stone System[2] developed by Joseph Winston in 1923, the resemblance to wood framing became less pronounced. Slabs of T-shape 16 in. wide were used. The top of the T formed the exterior wall surface. Bonding beams which served as girts for floor and ceiling were site cast between the stems of the T's with steel reenforcing bars running through holes in the stems. The portion forming the wall was 1½ in. thick; the stem was about 1½ in. thick and 7 in. long. Wood nailing strips were attached to the end of the stem in precasting and either lath for plaster or fibre board was nailed to this strip for an interior finish. The exterior was stuccoed. The slabs, when set up to form a wall, were mortared into a groove in the foundation. The same T-shaped units were also used for floors and ceilings with the stems acting as joists.

Beginning in 1934 the Pierce Foundation experimented with precast vibrated concrete panels, 3 by 4 ft., for single and double walls. Two houses were built. In this first insulated double panel units were used with concrete columns and steel beams for walls, floor and pitched roof. In the second house single concrete panels, lined with asbestos cement board, were used for exterior walls. Floors were double concrete panels. These experiments were discontinued since the cost of equipment and transportation did not indicate sufficient promise for low-cost housing.



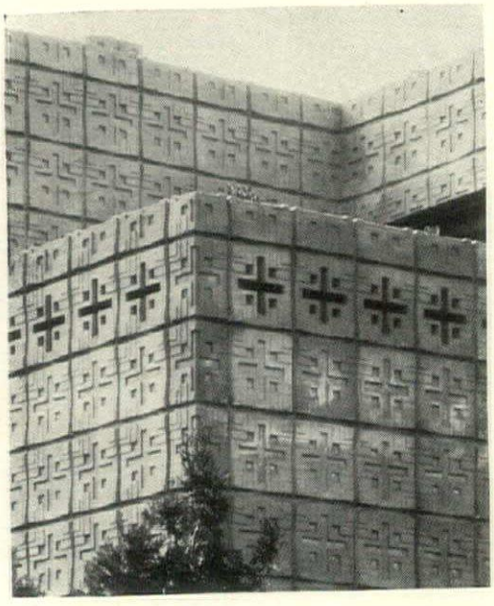


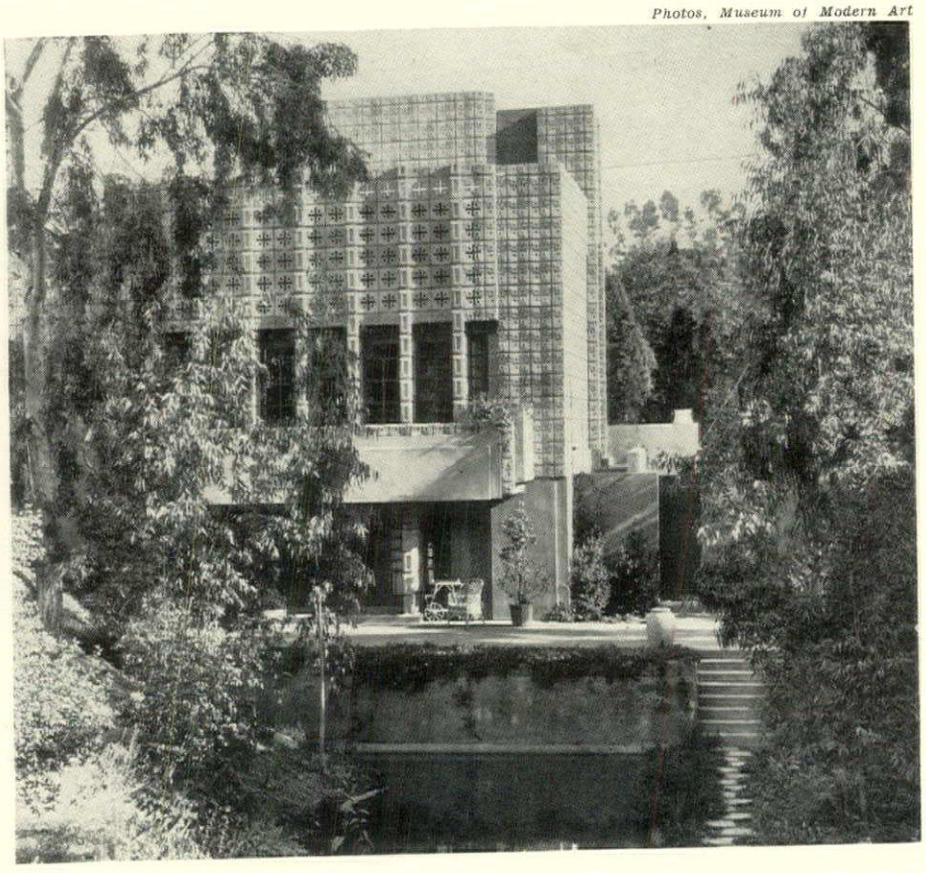
Above, Armostone system, a single-wall, precast system employing channel-shape units to form concrete studs. Below, the Simpson Craft system, which used flanges of precast wall panels as a form for cast-in-place studs.

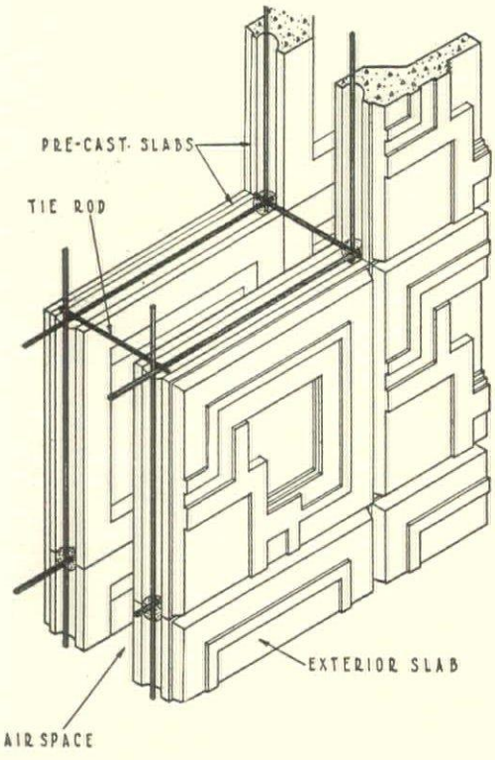


[2]**Report on Survey of Concrete House Construction Systems.** Portland Cement Association, Chicago. This report also lists several score of similar methods herein omitted for reasons of space, which present a series of variations of the methods discussed in this chapter.

Photos, Museum of Modern Art







Above, right, Millard house, Pasedena, Calif., best known of the structures by Frank Lloyd Wright employing his "Textile Block" method of construction, developed in 1921. Details above show relief pattern in face of block and method of assembling double, hollow walls and joining the units with a "warp and woof" of steel reenforcing bars grouted into the joints.

Special Materials, Methods

Throughout this work, attempts were made to lighten the slabs by using lightweight aggregates, dry porous mixes and various methods of aeration. Efforts were also made to obtain quick curing (so that forms could be removed without being idle 24 or 48 hours) both in precast and monolithic construction. Varying techniques, including steam curing, vibration, and vacuum processes were used to draw off the moisture. Numerous plans were also advanced for varying the texture of the concrete.

In 1934 John J. Earley, architect, was awarded the medal of the American Concrete Institute for making concrete an "architectural medium," after he developed methods for applying aggregates to vary the texture and color of the surface of concrete. He developed a house (ARCH. FORUM, Feb., '40) in which slabs from 1 to 10 ft. and story height were attached to 4 x 6 in. uprights spaced 2 ft. on center, and cast between wood studs. Crushed stone aggregates, in various colors and patterns, were exposed on the surface of the slabs to provide a decorative, attractive finish, and window and door frames cast into the panels with rounded reveals, sills, etc., formed in one operation.

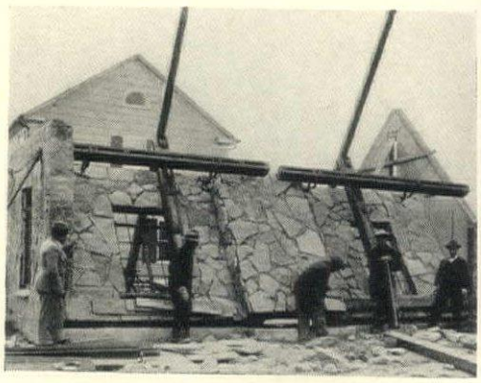
Another famed example of the attempt to improve the intrinsic interest and appearance of concrete as a material was, of course, the "Textile Block" process developed by Frank Lloyd Wright in California in 1921. While not envisioned primarily as a system of prefabrication, this process, with its use of a double wall of decorative block units interwoven and reenforced by steel reenforcement, came at least as close to a purist's definition of the term as many another which was so intended. In addition, it provided an attractive, workable construction system which was used with considerable success on a score of projects.

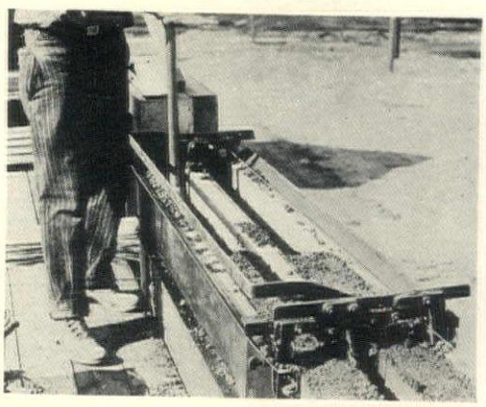
In the Wright system, a series of thin, square, precast block, with hollowed edges to receive a mortar grout and two-way reenforcing, formed both inside and outside surfaces of the wall, which were tied together by wire cross-ties. The block faces were either plain, paneled, or decorated with relief ornament, which was repeated over large areas of the finished

wall. Doors, windows, etc., were set in the wall in the ordinary fashion, and the balance of the construction was conventional.

Still other systems were developed to produce solid masonry by new processes involving at least partial prefabrication, with various surface veneers such as stone or brick. One method that was devised to create a solid wall of this type used large sections precast on the floor of the building and then hoisted into position with a specially designed derrick or hoist. In 1938 the Elmhurst Laboratory of the Portland Cement Association devised a hoisting mast to lift into place whole walls that had been precast horizontally on the site and allowed to set for two days.

Earlier the Carroll Tri-Ply System, based on the same method, had been developed by Samuel P. Carroll, an engineer of Chicago, and used for several hundred houses. In this system, entire walls were precast on a cast-in-place floor. Four inches of cinder concrete were poured over a waterproof insulation board, then 2 in. of cement mortar with wire reenforcement poured over the cinder concrete. For an exterior finish, stones were embedded in this mortar. The slab was then lifted into place by a derrick, using eye bolts cast into the slab. Rods cast into the concrete and projecting from the slabs were twisted together to hold the walls of the house in place. The result was a solid wall similar in many respects to ordinary masonry, but produced much more quickly and with less expenditure of skilled labor.



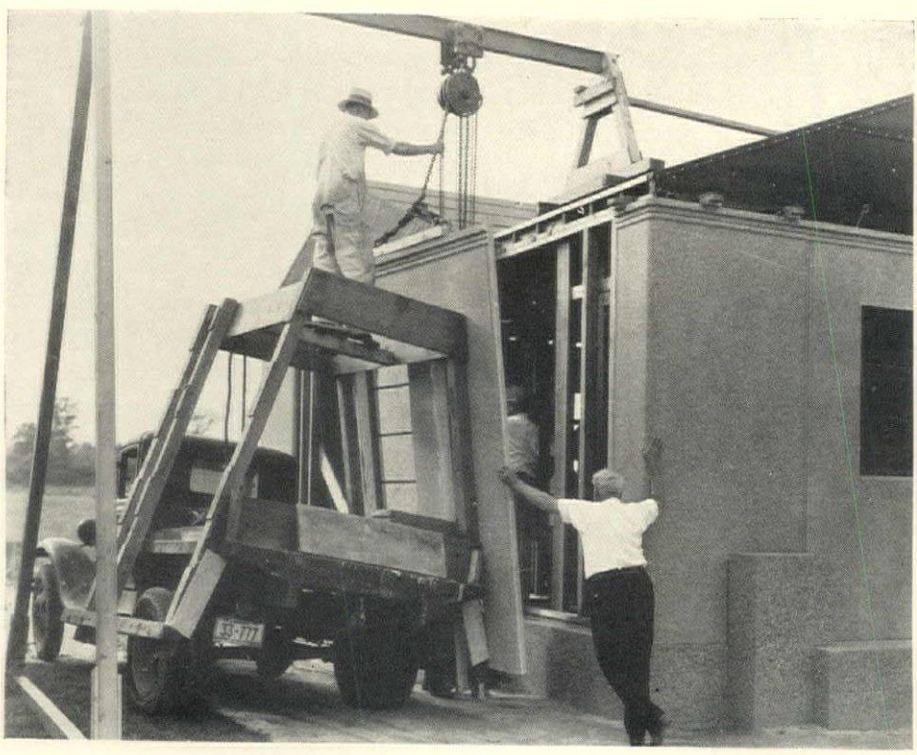


Above, Carroll "Tri-Ply" method of monolithic wall construction. Rock faced panels were cast on the floor, raised into position with a special hoist. Picture below shows apparatus for casting double monolithic walls according to the Van Guilder system, using a collapsible metal form.

MONOLITHIC SYSTEMS

At first glance, the various systems of monolithic, cast-in-place concrete construction which have developed parallel to the systems using precast units may seem even further removed from true prefabrication, but this is not necessarily the case. Edison's system employed this method, and certainly envisioned the industrial production of houses. Other methods, since proposed, have in the same fashion attempted the use of prefabricated forms for the efficient reproduction of houses on an industrial basis. Many of these have at least the same claim to be considered a part of the prefabrication movement, although in some instances the line separating mere improvements in conventional construction from a basic new approach is not entirely clear.

Below are two views of the process of construction developed by John J. Earley, Washington, D. C., "craftsman in concrete" in 1935. Earley's precast panels were faced with decorative, crushed-stone aggregates, attached to a wood frame to which conventional interior finishes were applied.



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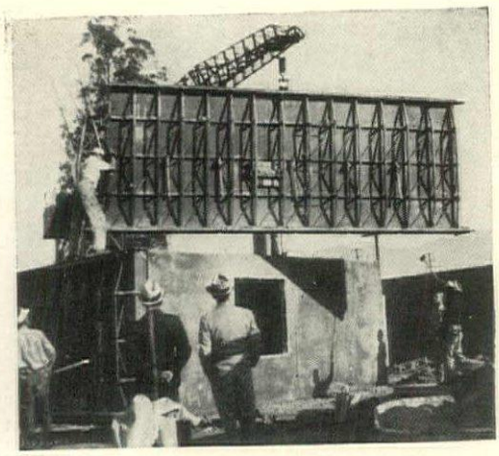

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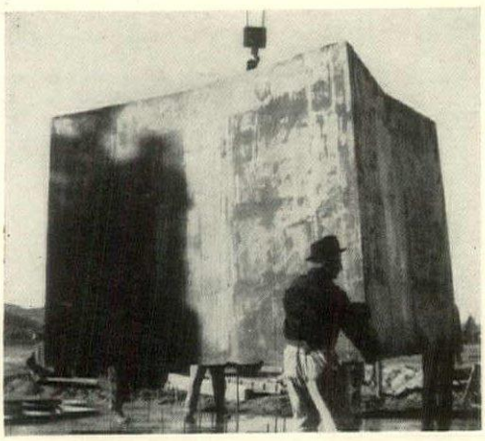

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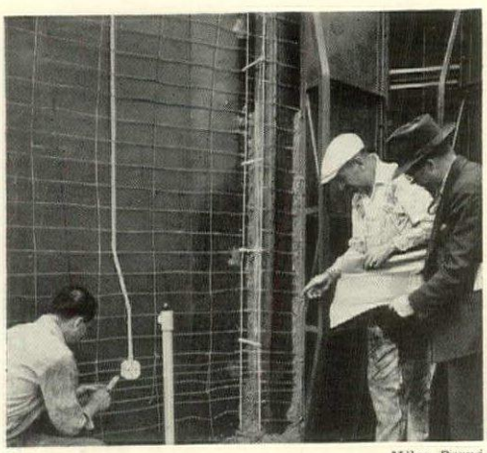

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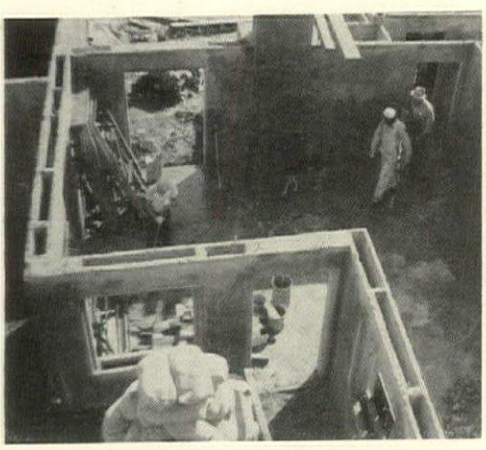

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Hayes "Econocrete" system of cast-in-place construction. 1. shows sectional exterior form, 2. room-sized interior form. 3. is a "cut-away" set-up of the typical wall, showing hollow core and method of reenforcing and installing pipes and wires. 4. shows section of completed walls.

Eisenstaedt-Pix

1.

Most of the monolithic systems, unlike those using precast sections, have used solid, load-bearing walls, rather than what amounts to a system of framing. In order to avoid thickening the whole wall for increased structural support, however, many have made provision for the pouring of column-like thickened wall sections where needed for structural support. Further, with the increasing emphasis upon insulation, still others have employed methods to create an insulating air space within the wall or a space where insulating material could be inserted. In some instances, this has been accomplished by creating studlike projections on the back of the wall to which an interior finish could be attached.

The basis of the monolithic systems were the forms devised for pouring the walls and floors. Some of these forms provided for pouring a whole wall at once. Others were designed for a method whereby a section was poured and the forms either raised or moved forward along the wall, or both, to pour other sections.

The Morrill System, developed by Milton Dana Morrill in 1908, used metal pan forms for pouring a 3 in. solid concrete wall in sections of varying size, using multiples of 2 x 2 ft. forms. The two assembled sections were hinged so that they could be released and swung either forward or upward on the wall to pour another section as soon as the concrete in one section had set.

In the Lambie System, developed by the Lambie House Corp. of Cleveland, Ohio, monolithic concrete walls were poured between a series of metal, pan-type forms, 9 in. wide and of wall height, placed side by side and held in place by steel angles fitted into notches in flanges on the exterior of the pans. Flat roofs could be poured with the same forms, or pitched roofs of conventional wood construction could be used. Floors were monolithic slabs poured in the same way, and finished with wood flooring, which was attached to metal clips embedded in the concrete.

Another system, developed by the Van Guilder Double Wall Co. between 1910 and 1915 and patented in 1917, provided for a double or a hollow wall of the monolithic type with each half of the wall from 2 in. to 4 in. thick, and an air space between. The wall was poured in courses 9½ in. high and from 2 ft. to 5 ft. long, using sheet metal forms with a lever arrangement by which the forms could be released and moved along the wall. The courses were poured continuously around the wall and then a new course placed on top of the previous one. A stiff mix was used and tamped down, making it possible to move the forms without long waits and thus pour three or four courses in a day.

2.

3.

Photos, Eisenstaedt-Pix

Another system for producing hollow or double walls of the monolithic type was that developed by K. T. Frost of the Hollow Concrete Wall Co., Mitchell, S. D. Frost used wooden forms on the outside of the wall and removable sheet metal cores for the hollow interior. Forms were of varying size in lengths of 4, 6 and 8 ft. and were moved progressively upward on the wall. Other systems providing walls with hollow cores included the Kiel and Larsen Systems, and that of the Monolithic Hollow Wall Co.

As in the precast houses, the attempts to utilize concrete in monolithic prefabrication by reengineering the structural support have been limited. The problem of weight or of quick curing has been approached in both monolithic and precast construction by attempts to change the nature of the concrete, but these efforts dealt with the substance of the material itself, rather than with the way in which it was used. Very recently, however, there have been attempts to approach the subject by modifying the basic structure, in order to develop systems applicable to low-cost housing.

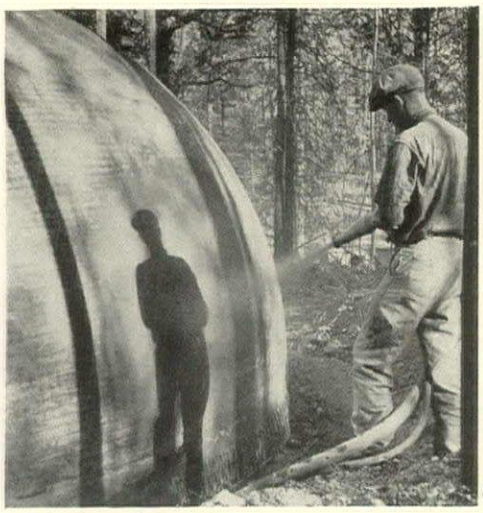
In 1939 Hayes Econocrete Forms, Inc., of Los Angeles, developed a system of pouring four complete walls for a room in one operation for a structure with a hollow-cored wall intended for the low-cost housing field (ARCH. FORUM, Mar. '39). Complete room size forms were lifted in place with a derrick. In removal, the forms for the cores were collapsed in a series of accordion pleats. The exterior and interior walls, which were reenforced with a wire mesh, were 2 in. thick with an air space of 6 in. Steel-reenforced, vertical ribs in the space within the wall were formed on 2 ft. centers, so that each 2 ft. section of the monolithic wall became a boxlike girder with the stress spread through the ribs and the wall surface.

Still more extreme was the monolithic house designed by Wallace Neff, architect, a series of which were erected at Falls Church, Va., in 1942, in an attempt to develop a low-cost war house financed by Jesse Jones' DHC. Using an inflated half balloon as a form, Neff built igloo shaped or "bubble" houses out of concrete. Door and window forms were placed against the sides of the balloon and thin concrete "Gunite" was sprayed over a wire mesh reenforcement. The surface was in three layers: a 1 in. layer at the bottom, covered with a layer of insulation, and then a final 2 in. layer of concrete sprayed over the insulation. After the concrete had set, the balloon form was deflated and window forms removed.

This house illustrates another application of the principle of shape engineering projected by Corwin Willson for his egg-shell house of plywood and utilized by both Martin Wagner and Buckminster Fuller in their igloo houses in steel. There was no frame and the structure depended

Progressive views (above and facing page) showing the method of construction used in Wallace Neff's famed "bubble" houses, built in 1941. 1, shows foundation slab ready to receive form, which is being put in place in 2. and is shown partially inflated in picture 3. Form was a huge rubber bag on which "Gunite" concrete, plus layers of insulation and waterproofing, was sprayed. Balance of process is shown on next page.

Wallace Neff, Hollywood, Calif., architect and designer of palatial homes for movie stars, studied at Boston Tech and spent five years in Europe and a few more in the shipbuilding business before beginning his architectural practice. He developed his balloon house as architect for the Defense Homes Corp.



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Final stages in the construction of the Neff "bubble" house (see also pictures on preceding page). 4. shows workman applying first "Gunite" coating, which was followed by insulation and a layer of waterproofing, shown being applied in picture 5. Views 6. and 7. show almost-completed and completed houses, which consisted of two such dome-like units separated by a connecting link of conventional block construction.

upon its shape to carry the stress throughout the reenforced concrete skin that formed the wall itself. One form of the house used two igloos connected by a flat-roofed section with a living room in one igloo or bubble and two bedrooms in the other. Entry hall, kitchen and bath were in the connecting structure.

As in the case of the systems employing precast concrete units, most of the methods of monolithic concrete construction have suffered from the disadvantage that, in order to develop really efficient new forms of construction, a considerable investment in forms and equipment has been required. This investment, in terms of the value of the quantity of product produced, has not been highly productive, owing primarily to the length of time the concrete must remain in the forms. Moreover, in most instances this equipment has been heavy and hard to move from place to place, as is essential in the use of the monolithic systems and desirable in the case of those employing precast units, in order to reduce transportation between plant and site.

During the period when most of these experiments were being carried out, the use of concrete in low-cost housing has progressed enormously, to a point where more than a tenth of the nation's houses are each year built from precast concrete units. But this has been done through the development of the simple, 8 x 8 x 16 in. concrete block, rather than any of the more complicated systems which more nearly represent the usual conception of prefabrication. Far from demonstrating that such systems are inherently "impractical" this actually proves the converse—that concrete construction is tending in this direction and will undoubtedly go further along this road. Present conditions, with their demand for nonpriority construction techniques, speed, and labor-saving methods, may well push it further and result in the improvement of many of the present systems, as well as the development of new ones. After the war new methods of handling concrete, some new plastic material with the advantages of concrete and without its high weight and heat conductivity, may result in the development of the plastic house so many are predicting. If so, the experience already gained in the handling of plastic concrete will provide an excellent beginning for such a system of construction.

(The fourth chapter of The Prefabricated House: **Steel—Prominent in the Early Stages,** will appear in the March issue. To any reader who is interested in studying particular aspects of the subject further THE FORUM will supply without charge a complete bibliography of 85 FORUM articles on prefabrication published since 1932.)

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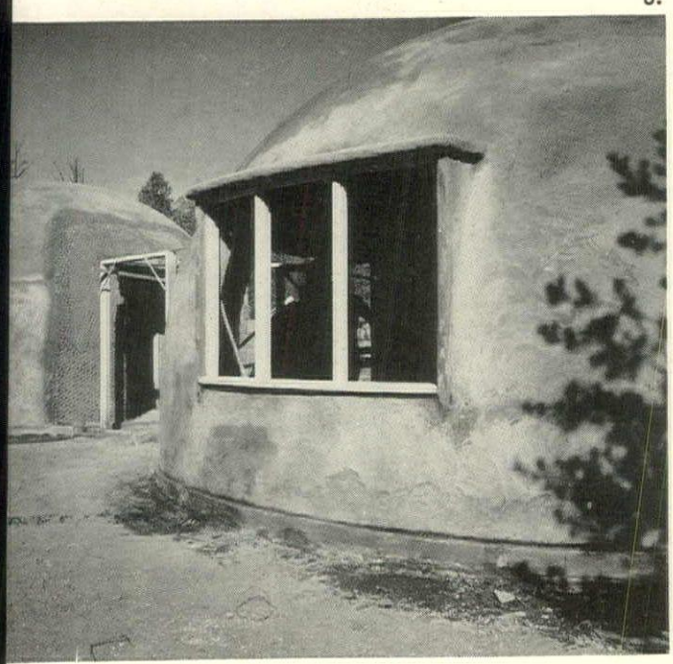

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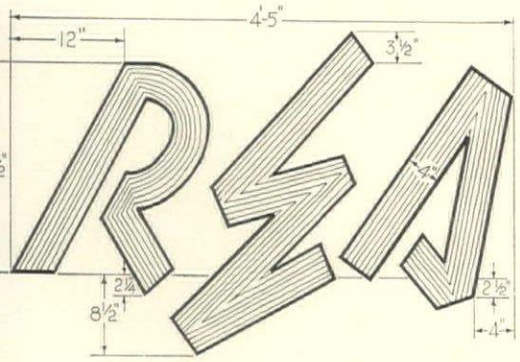
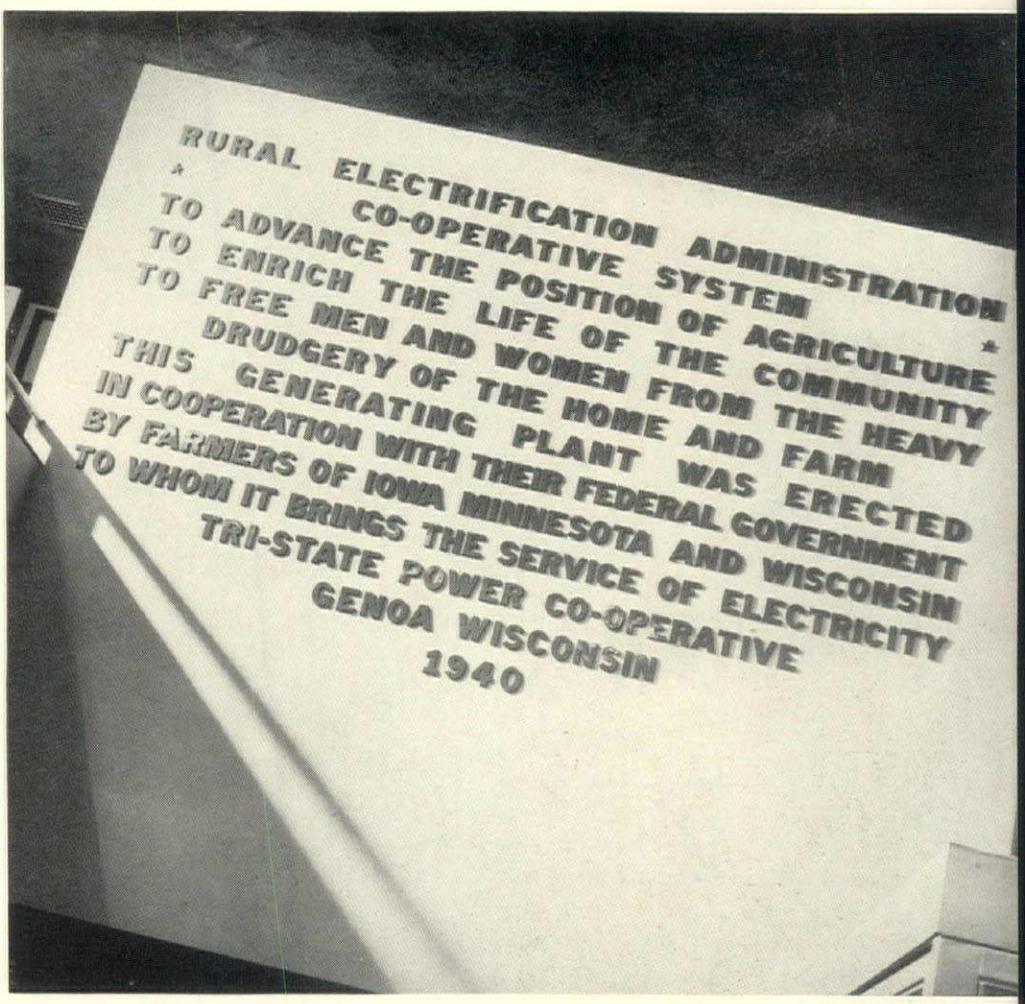




HEADQUARTERS BUILDINGS FOR A PROGRAM OF RURAL ELECTRIFICATION

THE Rural Electrification Administration is one of a group of Federal agencies created to meet some of the problems of the farming section of the population. Its objectives are clearly stated on the inscription (above) which has been placed on the headquarters building of one of its cooperatives. Its accomplishments are summarized below. The buildings presented here are an important part of these accomplishments, not because they are an inevitable result of a program of electrification, but because they again demonstrate how an intelligently directed enterprise can produce culturally valuable as well as materially impressive results. The work of the Farm Security Administration will be remembered in this connection: instructed to deal with the critical problems of migratory farm labor, FSA produced buildings and communities which have since become known far beyond the borders of the country. These headquarters buildings for the REA cooperatives represent a similar "plus," for they too have created new standards of architectural quality in rural communities. Their tangible demonstration of what rural architecture might be like has already set in motion new social forces whose full potential will be realized after the war. REA has again shown, as did TVA before it, that a rounded planning program inevitably creates by-products which may be no less significant, in the long run, than the initial objective of the program.

REA's big immediate achievement is that it rushed in where the private utilities feared to tread—and got away with it. The big obstacle to rural electrification, prior to the creation of REA in 1935, was the unwillingness of power companies to extend their lines into farm areas. This reluctance stemmed quite understandably from the fact that power lines are costly, and returns, in the sparsely settled countryside, are low. The first job to be tackled by REA, therefore, was the development of practices which would reduce initial costs, and the engineers and researchers did the job so effectively that the cost of rural power lines dropped to one-half of what it had been. Part of this impressive slash in price was the result of improved construction; of equal importance was the thoroughgoing standardization of previously haphazard building practices.

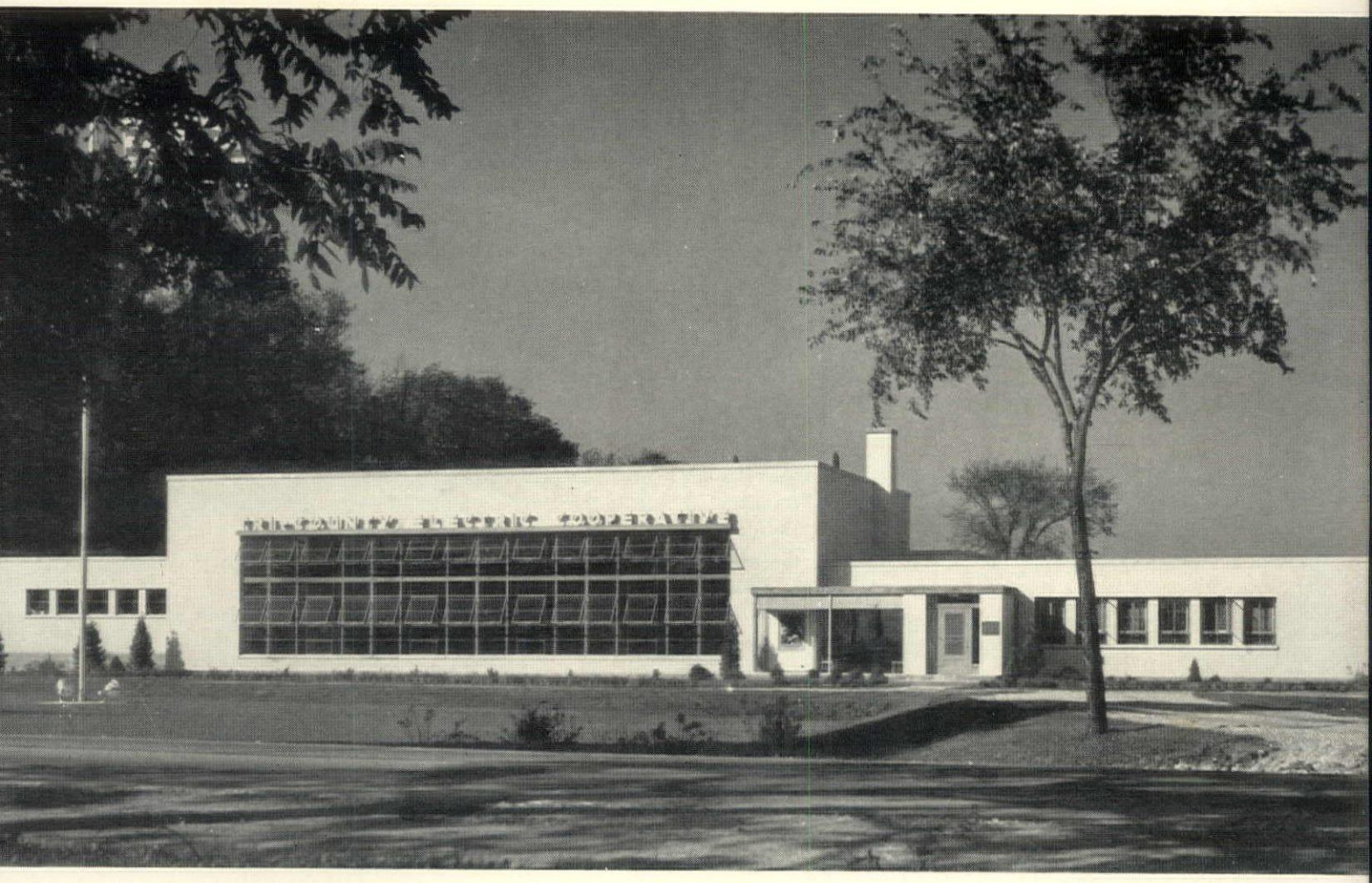
It is not possible to understand the significance of this pioneering work without a picture of the operation as a whole. In the first seven years of its existence REA built almost 380,000 miles of rural power lines at a saving of $700 or more per mile, a very substantial sum when deducted from the electric bills of the consumers. Construction extended through 46 states, Alaska and the Virgin Islands. There are about 800 cooperatives which have been financed through REA funds, and each will eventually own its own power system free and clear. In addition to the million farm homes which now get REA power, there are 20,000 rural schools with electric light for the first time, and over 3,000 manufacturing and processing plants. In the light of the urgent need for maximum food production REA has more than

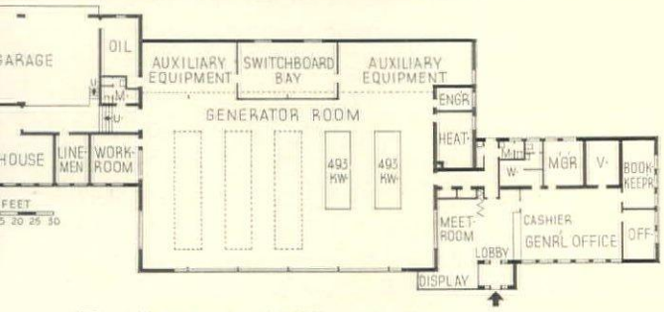
justified its widespread operations during the past seven years.

On at least one other account REA may be said to have earned the approval of the man in the street: it is a self-liquidating financing agency. In 1936 the Congress allocated $640,000,000 for loans to power cooperatives. A major problem from the start was to meet the demands of farm groups all over the country, as applications invariably exceeded the money available for loans. The natural eagerness on the part of farmers for electricity, and the labor-saving devices that went with it, was materially increased by the manner in which REA loans were allocated. The local sponsoring group, usually a cooperative, makes the loan, mortgages the property and agrees to pay the loan, with the same low-interest rates the Government pays on long-term obligations, and it agrees to repay the loan within 25 years. Farmers have joined the cooperatives without hesitation, because they assume no personal financial liability. There is no better indication of the flourishing state of the co-operatives than the last financial statement of REA, which shows that repayments on loans in advance of due dates now total around $8,000,000. So much for the financial and operational picture: the long-term social perspective is even larger. The number of electrified farms in the country has quadrupled since 1935, but the total remains unimpressive, for it still leaves 62 per cent without power. Our farms have lagged far behind the cities in the matter of living standards, a situation very accurately reflected in the steady flight of rural youth to the urban centers, where opportunities and rewards were incomparably greater. This exodus, which stopped only during the worst of the depression years, continually drained the countryside of its best people, leaving the rural areas even less able to close the gap between city and country. To a degree not always realized, living standards can be measured in terms of electric power. With power come automatic heat, washing machines, adequate lighting, vacuum cleaners and all the other labor-saving devices for the home. On the farm itself, power means electric milkers, churns, incubators, brooders and the hundreds of other machines whose worth can be measured directly in terms of increased productivity. For churches, schools and other rural community buildings, electricity brings the cultural advantages of the 20th century. Above all, it is the indispensable basis for industrial decentralization. Most planners agree that the small, efficient factory will be an integral part of the future rural scene, and that it will be one of the most powerful factors in the process of bringing rural standards up to the city level. REA's work, therefore, not only follows a trend, but implements a desirable social objective. There is another need of farmers which is much closer to fulfillment because of the extension of power lines—the rural community center. A survey by the Agricultural Extension Service in Illinois indicates that community buildings are needed for "organizations carrying on social functions, extension work, plays and entertainments, recreation and athletics, demonstrations, church functions, exhibits, community fairs, carnivals and part-time adult education classes. They are also needed for work centers, with facilities for repairing home and farm equipment, furnishings and tools, for canning and preserving and for processing agricultural commodities for market." This is a large order, and it is beyond the scope of the power co-operatives. Nevertheless, these scattered REA buildings have already provided the entering wedge.

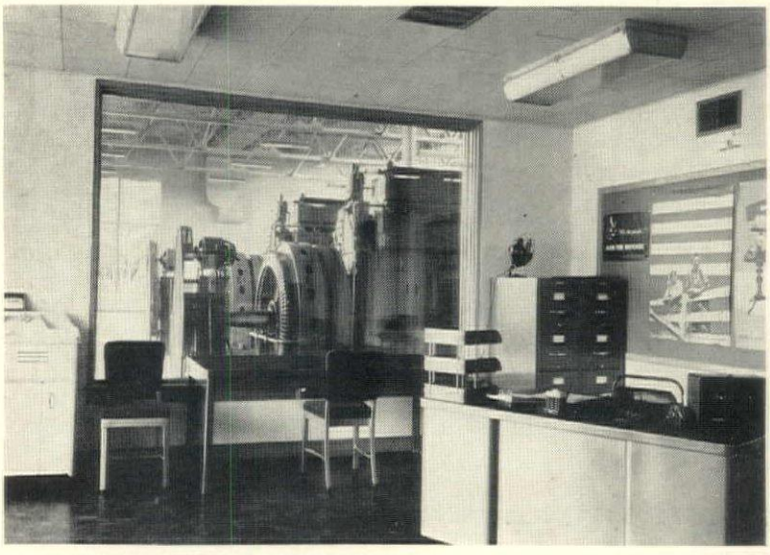
In many cases, for instance, the REA headquarters has been located on a plot of 5 to 25 acres, donated by civic groups with the understanding that the land would be used for a future community center. One REA cooperative is already planning an eventual development which will include indoor and outdoor recreational facilities, workshops, a model farm, a cold storage locker, cannery and processing plants. All of this preliminary activity, let it be noted, is the result of stringing up some power lines, with the additional stimulus of a long-range plan. Postwar building will take its architectural direction from the excellent REA cooperative headquarters which are shown here.

Space for the REA power cooperatives was obtained on rental, at the beginning of the program, using converted residences, garages, warehouses, stores, etc. Many of the co-ops soon showed a desire to acquire their own buildings, but the properties purchased did not always offer the best security for the funds borrowed, nor were they particularly efficient in operation. This situation led to the beginning of experiments in providing central guidance for the co-ops, and the first step was the appointment of Roland Wank, Chief Architect of TVA, as consultant. The first projects under the new setup were designed in the consultant's office. In some instances working drawings, specifications and supervision were handled by local architects. These new buildings came in for a good deal of favorable attention, and soon the other cooperatives were applying for architectural services of the same type. As the design program began to take on a permanent character, the question of who was to prepare plans arose. There were some who felt that the cooperatives would be best served by an architectural office in REA; others suggested turning all jobs over to a private firm. The final decision, however, was that the work be done by local architects, with guidance by a highly competent professional staff maintained by REA. The function of the central group was to pass on experience accumulated in the





The Tri-County building, in Portland, Michigan, is a combined diesel generating plant and office headquarters. Its main element, the generating room, has been treated as a display feature, from both inside and outside the building. The customary offices for a distribution cooperative are located in the right end of the building. Note the accordion partition between lobby and meeting room, giving excellent flexibility in the use of these spaces. Architect and Engineer: J. & G. Daverman Company.



CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—light gray face brick with common brick backing and salt glazed tile interior finish in generator room. Plaster finish in office portion. Interior partitions— stud with plaster finish in offices. Roof framing—steel girders and joists over generator room, bar joists over office and garage areas. Floor construction —concrete slab.
ROOF: 5-ply pitch and gravel.
FLOORS: Monolithic cement in generator, auxiliary and garage and storage areas; asphalt tile in office and public spaces.
WINDOWS: Steel projected sash.
INSULATION: Rigid insulation board on all roof decking.
HEATING: Forced air heating and ventilating system. Combination waste heat and oil fired arrangement.

design of headquarters buildings, and to guard the interest of the lending agency. Certain standards were recommended to the local architects: lettering, counters, bulletin boards, flagpoles, norms for windows, etc. This procedure has worked well. It gave work to private offices, provided a reasonable degree of standardization, so that an REA office would be instantly recognizable as such, and the review of drawings by the REA group of architects gave assurance of a high standard of planning and design. After this system had been in effect for some months, Roland Wank withdrew, and the work was transferred to Henry Shotwell, who took charge of the continuing program.

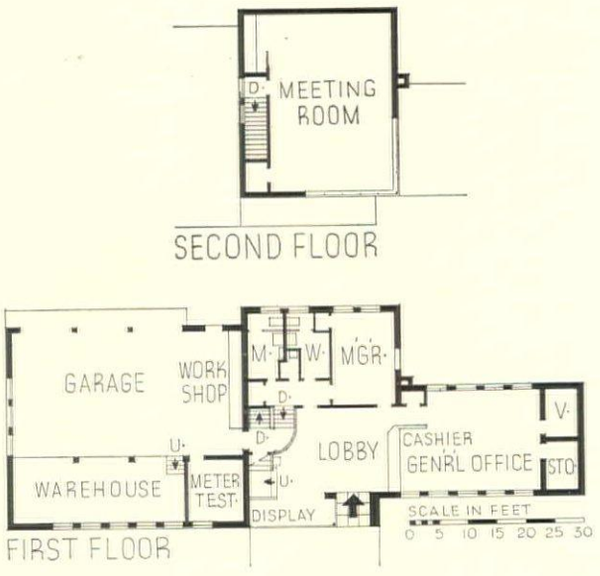
REA's description of the operation of the architectural unit is interesting: "Project applications in connection with co-operative buildings are received, and direct contact is established between the architectural unit and the Board of Directors of the cooperative. Naturally enough, the members of the Board are inclined to propose plans for the future in the image of their past experiences, which are often limited to a small town and its immediate surroundings. Architecturally speaking, they sometimes propose structures ranging from a replica of the feed and grain store to an imitation of the county court house, much reduced in scale. The usual shortcomings of small-town structures from the viewpoint of fireproofness, permanence, light, ventilation and efficiency of arrangement tend to be accepted as normal rather than as obsolete standards. The REA approach often strikes the management of such co-ops with something of a shock; the discussions, therefore, often extend over a considerable territory including standards appropriate to this mechanical age, and the function of electricity and distributing cooperatives in bringing about the world of tomorrow. Stress is laid on the results which can be attained if the co-op thinks of itself not merely as a substitute for a private business organization, but rather as a front-line force to secure for rural America the benefits of modern civilization. It should be noted that the meetings are a testimony to the innate ability and eagerness of rural people to grasp such ideas and to take their place in forward-looking movements. As a rule, when the buildings are finished, boards of directors, employes and membership alike are satisfied and extremely proud of them and never want to go back to the concept with which they originally approached the enterprise."

REQUIREMENTS: HEADQUARTERS BUILDINGS

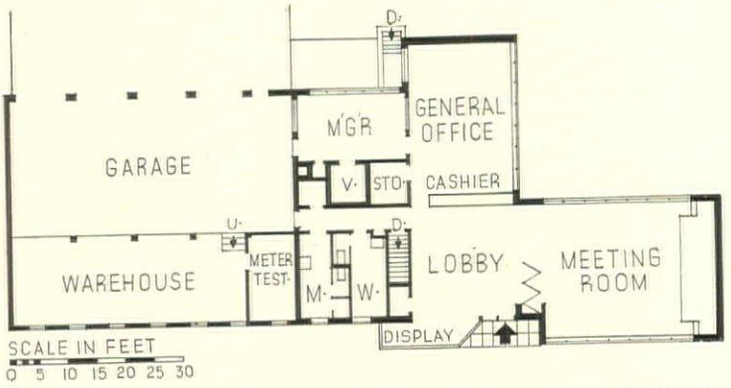
In selecting the site for the construction of a cooperative headquarters, REA has encouraged the practice of giving preference to locations just outside the town limits. Naturally the town selected should be as near the center of the project as possible and also should be a fairly good shopping center.

The cooperative is usually encouraged to secure a tract of one to five acres, so that there will be ample space for the building, parking areas, truck service yard and pole yard. From a public relations viewpoint it is advantageous to have the building on a much-traveled highway.

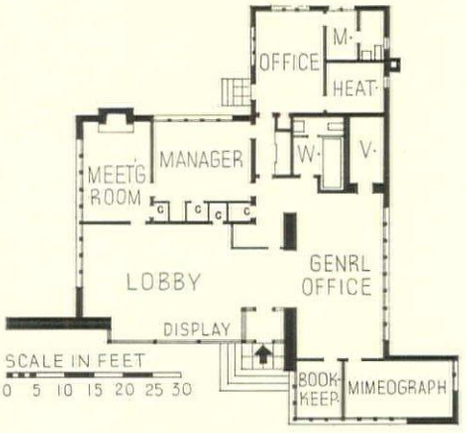
In general, the plan requirements are standardized; however, the size of the office, garage and warehouse area depend upon the size of the project. No matter what the size of the project, the following elements are required in every office.



The headquarters of the Valley Rural Electric Cooperative, in Huntingdon, Pa., was completed about a year ago. It is built of light gray face brick, with concrete block backing. The plan is a good example of the earlier type with the meeting room upstairs. Architect: Edmund George Good, Jr.

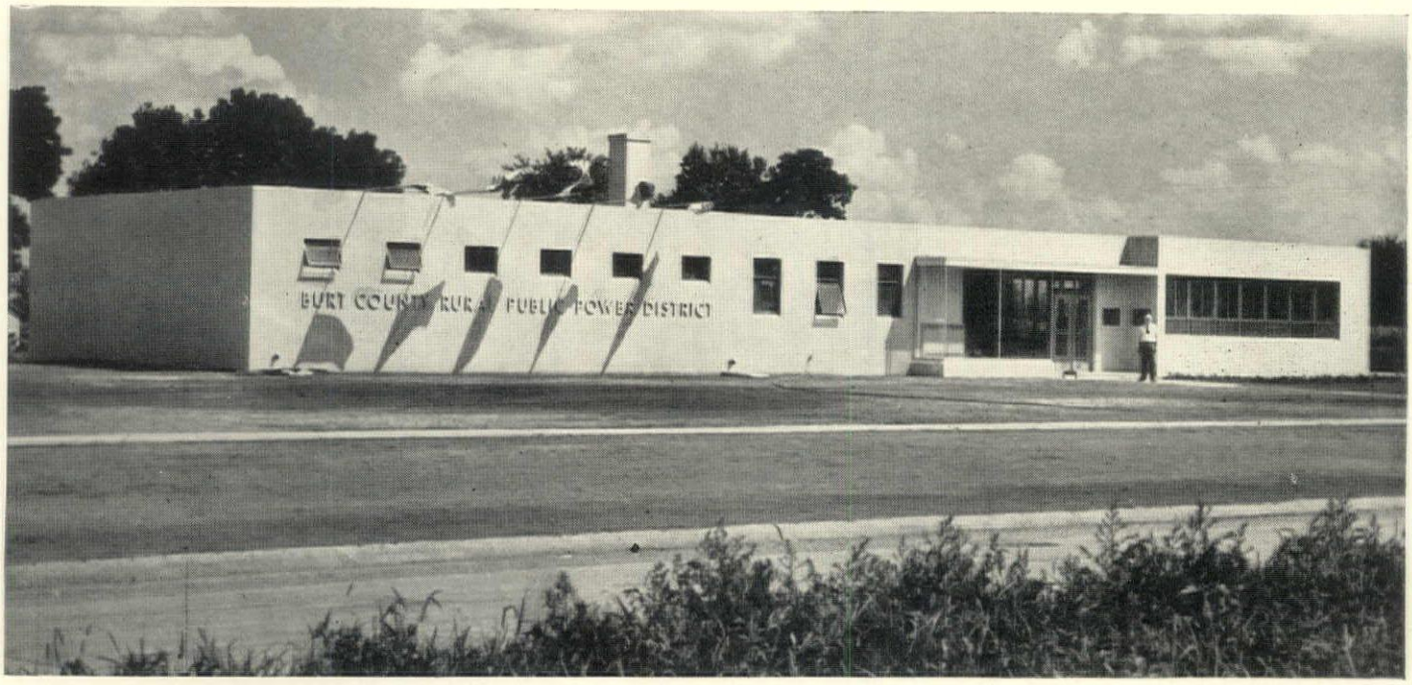


The Burt County headquarters, at Tekamah, Nebraska, is built of reenforced concrete. Its layout is considerd by REA as one of the best yet developed. Especially workable features are the lobby and meeting room, used separately or together, and the manager's office, which overlooks both garage and general office. Architect: H. H. Henningson Engineering Co., Inc.



The two buildings at the right indicate the latitude with which REA views its own recommended standards. Top O'Michigan (plan above) is executed in the native limestone of northern Michigan, while the building at Johnson City, Texas (right) also uses local rock. The building was put up as part of a NYA project. Architects: Top O'Michigan, J. & G. Daverman Co.; Pedernales, Roland A. Wank and Mario Bianculli, TVA.


VALLEY RURAL ELECTRIC COOPERATIVE
REA
REA CO-OP


BURT COUNTY RURAL PUBLIC POWER DISTRICT


REA

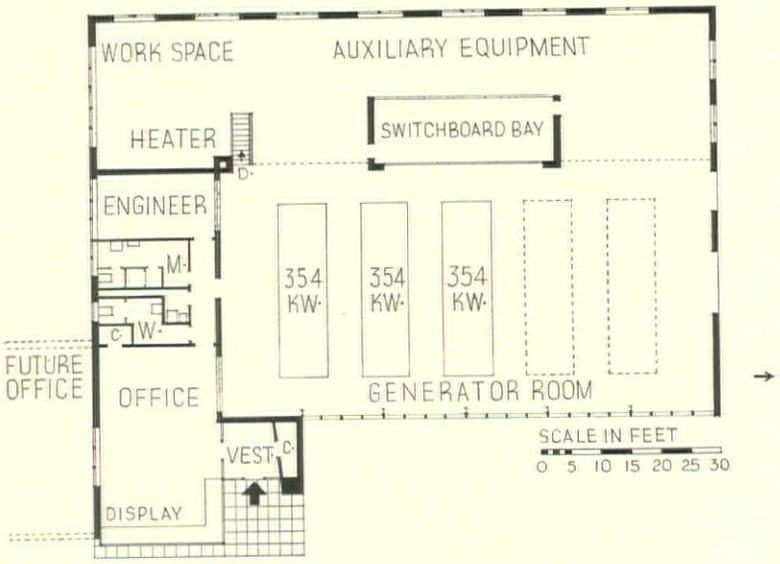

FEDERAL ELECTRIC COOPERATIVE

1. A large unobstructed display window for electrical appliances and farm equipment. There is usually a brightly colored tacking board in one corner of the window for the display of posters and other material of interest.
2. A lobby and reception room for consumers when they come to pay bills, attend meetings or for other purposes. This lobby is always adjacent to the display window.
3. A cashier's counter which is generally placed at one end of the reception room and usually forms the only separation between that area and the general office.
4. Except in the smallest buildings, there is an office for the superintendent or manager. It is located where the manager may observe the general office and service yard.
5. Garage and warehouse area is used for trucks and for the storage of line equipment and material. Storage space is customarily located at the rear of the garage.
6. Toilet facilities are an important requirement, and are placed for accessibility to the general office, garage and public area.
7. Some form of assembly room is needed for the monthly meeting of the Board of Directors of the cooperative. In the smaller projects these meetings are sometimes held in the superintendent's office. At first the assembly rooms were placed on the second floor, usually above the lobby. In later buildings they are on the first floor, adjacent to the lobby and separated from it by folding doors.
8. Supply closets for office material, coat closet, a janitor's closet with slop sink, and space for the heater unit (if needed) are general requirements of every plan.

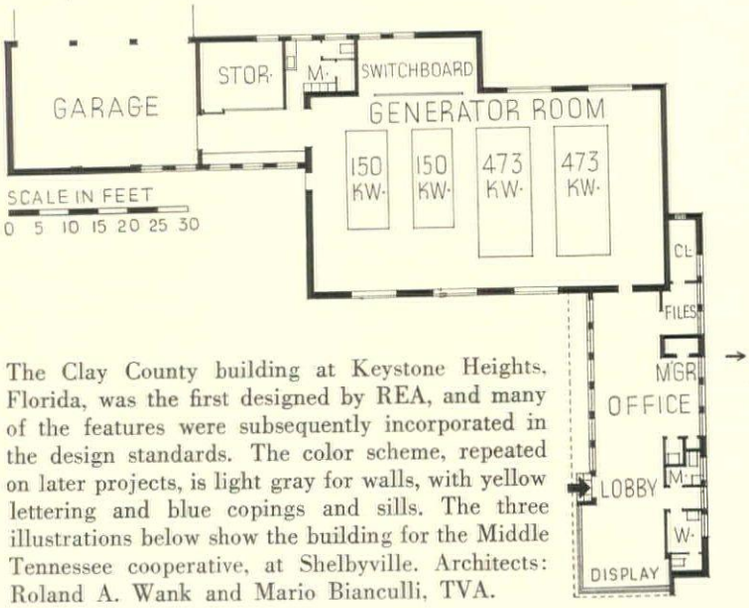
These are the general requirements. Orientation, contours and size of plot, naturally, have a strong influence on the plan. It will be noted that some of the buildings include a power plant. This factor, however, does not usually change the office requirements. Some of the larger plants contain office space for the transmission of personnel as well as for the distribution cooperative, and in such cases the plan is so arranged that public facilities may be used jointly.

The location of cooperative headquarters within the community is not strictly a part of the design process, but it has received careful consideration from the REA architectural group. This problem is studied not only from the cooperative's point of view (convenience for public and employes, real estate trend, value of the proposed site) but also in relationship with the community. It was recognized that in small towns, a modern building, attractively landscaped and with plenty of light and air around it, would exert an influence on the development of its surroundings, and that this feature should be utilized to guide the growth of rural towns in desirable directions. Many of the cooperatives have already acquired sufficient land to permit the development of a complete community center.

Architects for the earliest REA buildings were Roland A. Wank and Mario Bianculli, both of TVA. Since 1941, Henry Shotwell, assisted by David E. Lovell, has been in charge of the architectural unit, now known as the "Building and Structures Section of the Design and Construction Division." Division Chief is Guy W. Thaxton. Present acting head of the section is Carlton F. Blickley.

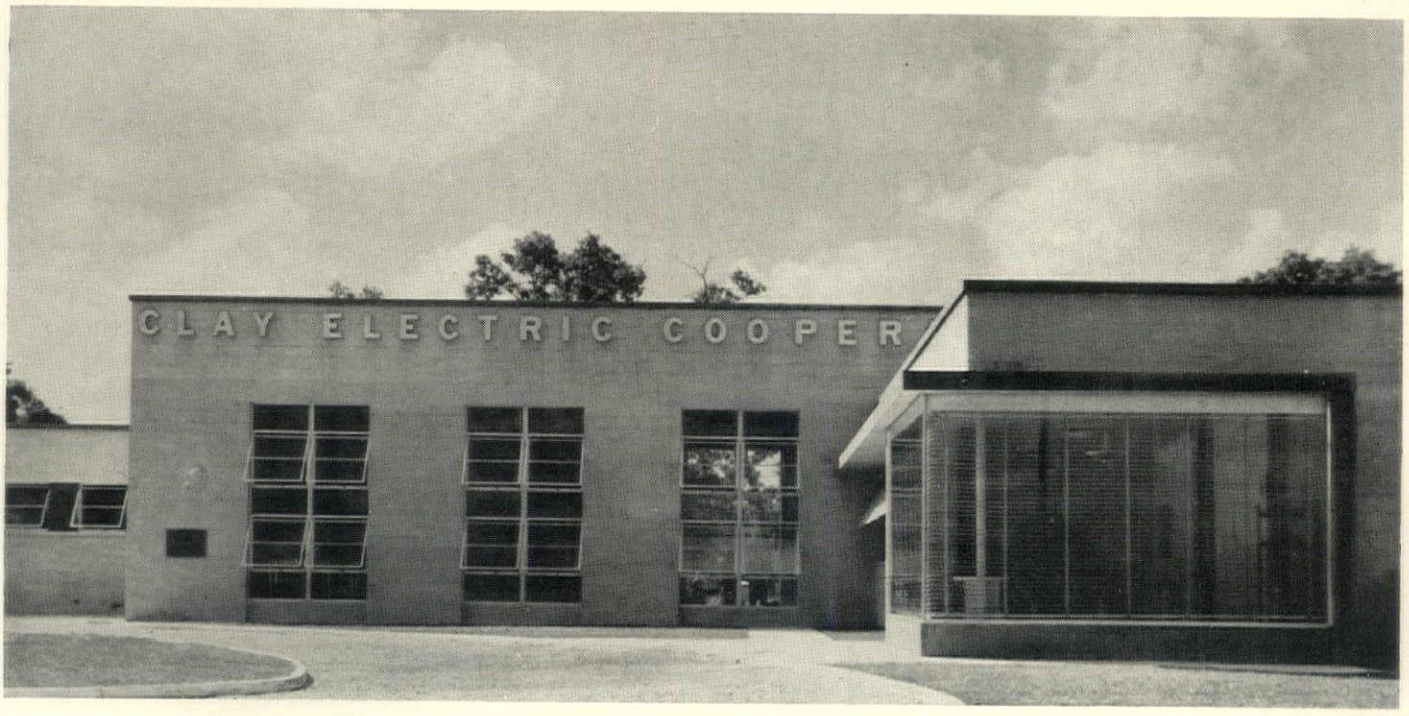


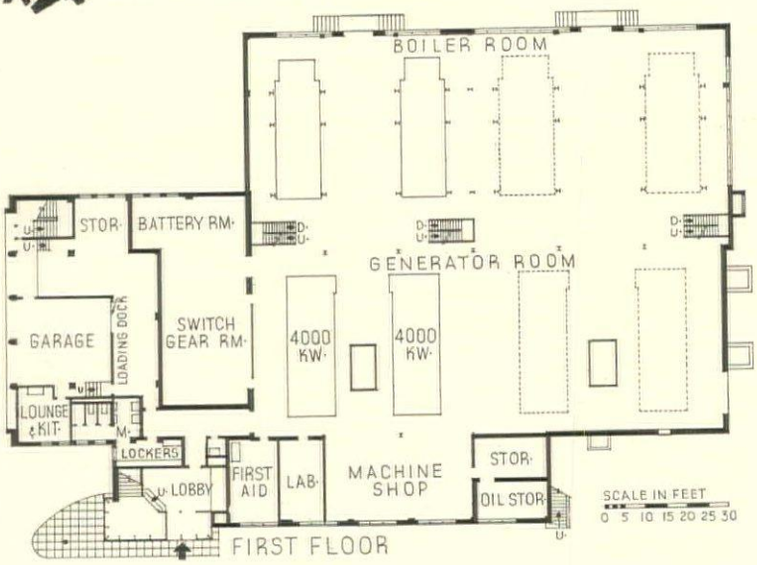
The Border Counties Cooperative is located in Warroad, Minnesota, near the Canadian border. It is the most recently completed REA generating plant. Placing of the storage area at the rear permits future expansion of the generator room. As in the Tri-County plant (page 81) the generating room is also used as a display feature. Architect, engineer and contractor: General Engineering Corporation.

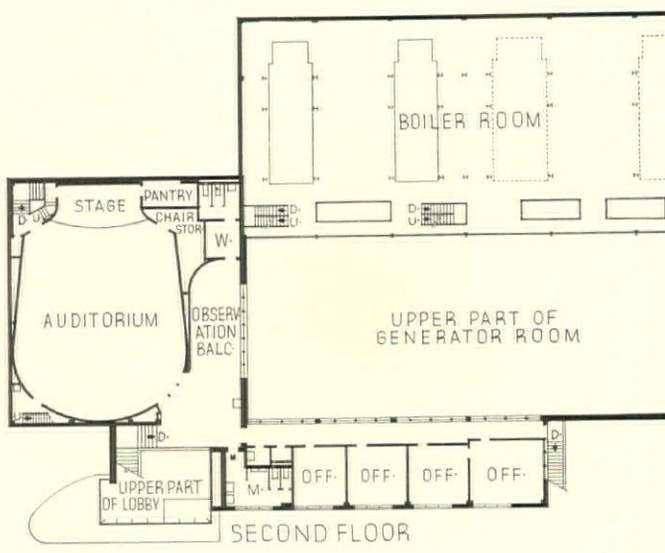


The Clay County building at Keystone Heights, Florida, was the first designed by REA, and many of the features were subsequently incorporated in the design standards. The color scheme, repeated on later projects, is light gray for walls, with yellow lettering and blue copings and sills. The three illustrations below show the building for the Middle Tennessee cooperative, at Shelbyville. Architects: Roland A. Wank and Mario Bianculli, TVA.


BORDER COUNTIES POWER COOPERATIVE


CLAY ELECTRIC COOPER





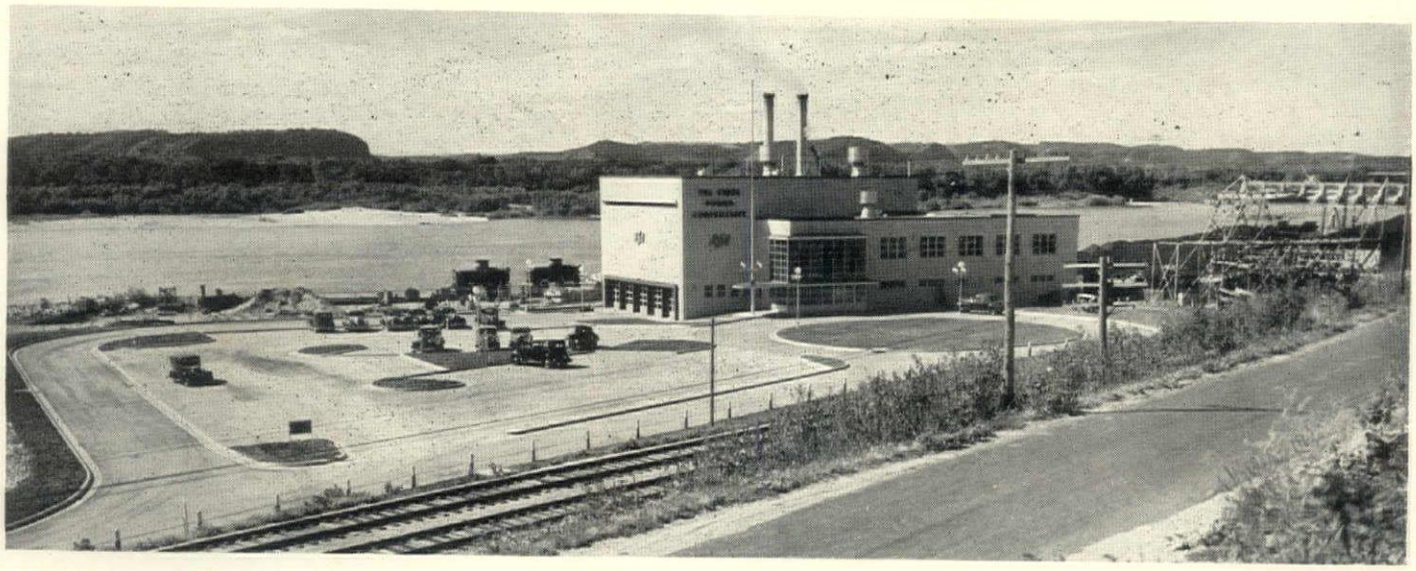
The steam plant for the Tri-State Power Cooperative at Genoa, Wis., is the largest yet built with REA funds. It is to have 300 miles of transmission lines, will supply twelve or more distribution cooperatives, providing service for more than 15,000 farms in Wisconsin, Minnesota and Iowa. Ultimately to be linked up with another REA generating plant, it is designed to become the largest cooperative generating system in the world, serving 50,000 farms and other users. The plant is located between a railroad and the Mississippi River, and uses the transportation facilities of both. The site, while not large, has all necessary facilities. Because large numbers of visitors were expected, including members of the various cooperative committees, the public spaces have been given more emphasis than is customary. The lobby is two stories in height, has an exposed steel framework, and opens to a second floor balcony from which the generator room may be observed. The balcony also serves as a foyer to the auditorium, which has a seating capacity of 300. The level floor permits use of the room for social purposes as well as lectures, displays and motion pictures.

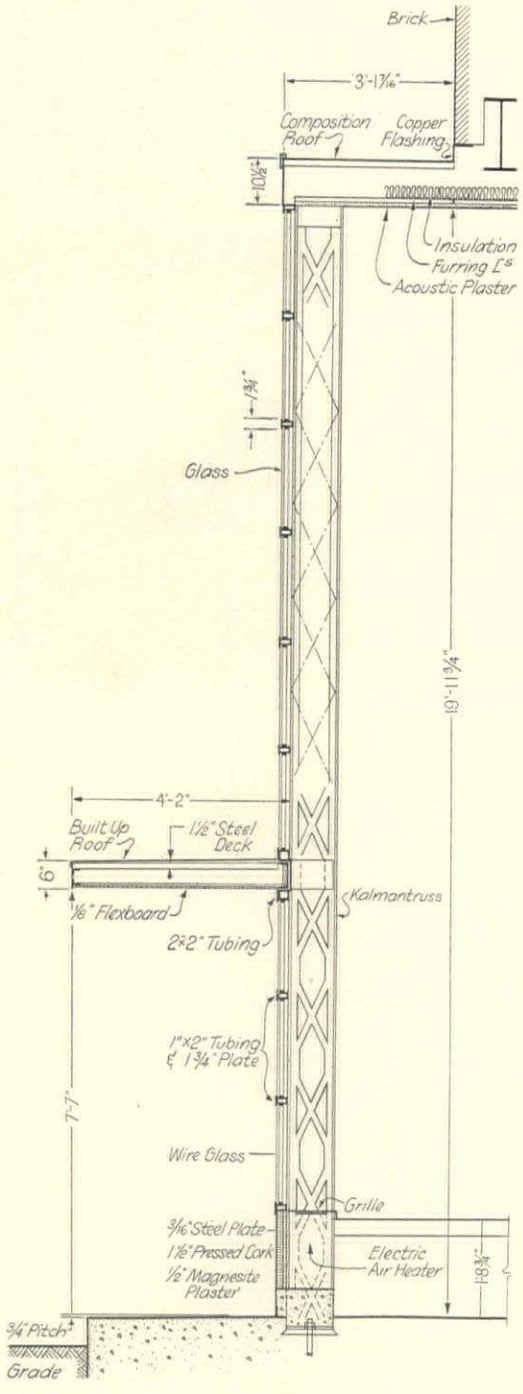
The plant was originally designed and built for two units, with provisions for expansion to a total of four generators. Due to the imminence of war, the cooperative decided to proceed immediately with the full program, and the plant now stands complete.

The unusual size of the offices and other service facilities is due to the large amount of maintenance work done, and because billing, purchasing and warehousing for the member cooperatives is carried on at this building. The blackout ventilators are an interesting feature. They appear in the lower photograph on the facing page and in the details.

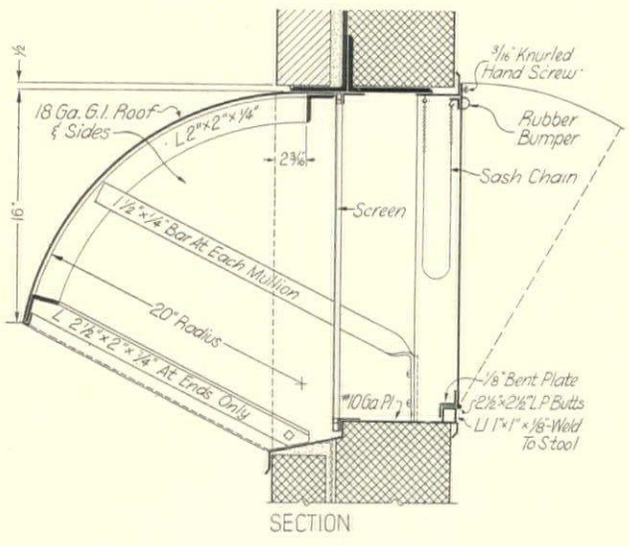
INTERIOR FINISHES

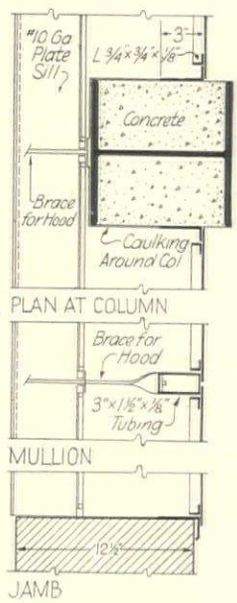
Public Spaces and Offices: mastic tile floor, plaster walls, plaster ceilings, painted.
Office partitions are glass and steel, baked-on enamel, of removable type.
In Auditorium floor is mastic tile, wall wainscot is acoustic tile, walls are plaster, and ceiling is acoustical plaster.
In toilets, floors and walls are lined with tile. Ceilings are plaster, stalls are metal, fixtures are vitrified china.
In Generator Hall, Machine Shop and Accessory Spaces, floors are cement hardened and integrally colored; walls are lined with large size glazed tile, blue-green; roof construction is exposed.
In all other spaces floors are cement, with hardening but without color, and walls and ceilings are painted with cement paint.
Lighting is both direct and indirect and the building is floodlighted.
All Public and Office Spaces are fully air-conditioned.





SECTION THROUGH ENTRANCE WINDOW



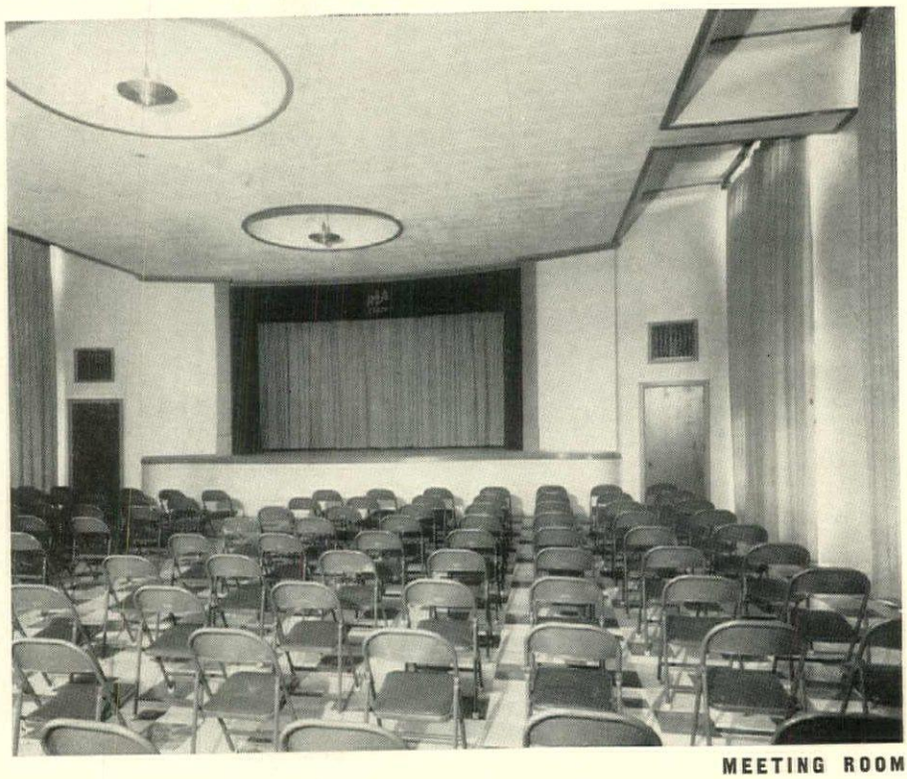


DETAILS OF VENTILATION SLOTS

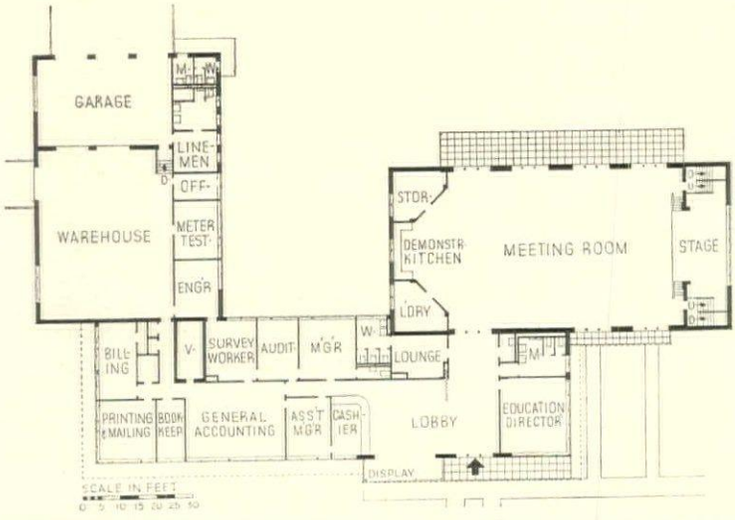
The Upshur Cooperative, at Gilmer, Texas, has the largest project headquarters undertaken by any REA system. It serves one of the largest membership groups in the country and has extensive rural lines. The building is located on 26 acres of land, donated by the cooperative's supporters, and it is planned to develop around it a complete rural educational and recreational center after the war. The meeting room is used for demonstrations of kitchen equipment, membership meetings and educational conferences.
Designers: Roland A. Wank and Mario Bianculli. Architect: Preston M. Geren.

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—precast stone with brick backing and plaster finish. Interior partitions—stud with plaster finish. Auditorium trusses—wood. Roof framing—wood with hung ceiling. Floor construction—concrete slab.
ROOF: 15 year bonded pitch and gravel.
INSULATION: 4" rock wool in all ceilings except garage and warehouse.
FLOOR: Monolithic cement finish.
WINDOWS: Steel casement.
HEATING: Natural gas, duct and unit



MEETING ROOM



DEMONSTRATION KITCHEN

148 Pages Crammed With Information For Architects On Maintenance and Paint Protection. Coupon Below Brings A Free Copy For Your Files.

PITTSBURGH'S "Maintenance and Buying Guide" is the most comprehensive book of its kind ever offered. The first 48 pages contain a detailed maintenance guide for every type of surface from roofs to cellar floors. Here you will find the facts you require when clients ask your advice on questions of maintenance. Also included in this book is a complete catalogue of paints, finishes and other items necessary for property protection, with full instructions for their use. 247 color swatches make the selection of suitable colors easy and simple.

Although new construction is limited for the duration, there are no restrictions on maintenance and repairs. Since the war has placed this special emphasis on property protection, the Pittsburgh "Maintenance and Buying Guide" becomes a "must" for every architect's office today. The coupon below will bring you a free copy by return mail.

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MONTH IN BUILDING

(Continued from page 36)

Myron Davis

PAUL G. HOFFMAN: "We shall serve as catalyst . . ."

man of CED's work: "We shall attempt to serve as a catalyst, hoping to help American businesses everywhere to mobilize their own activities for the common objective."

POSTWAR NOTES

►Other forages by private industry into postwar planning were made by the Producers Council's Arthur H. Hood (Johns-Manville) with his announcement that the Council has launched a "postwar program with emphasis on coordinated research and marketing changes." Five committees will lay the groundwork: technical, industrial and consumer relations, Government relations, financial and marketing.

►To New York's Building Congress George Sloan (Commissioner of Commerce for New York City) told industry to be prepared for its part in postwar reconstruction, and warned the Government to provide "a proper environment in which private industry, private investors, private trade and indeed, a free society can proceed in confidence."

►The *New York Times*, in its annual summary of the year in industry, pointed to Business' new interest in postwar plans. (Corporations with departments for this purpose: General Electric, Westinghouse, U. S. Steel, Johns-Manville, Pan American Airways, United Airlines, Goodyear, Goodrich, U. S. Rubber, Firestone and others.)

Reported the *Times*:

"Around midyear the war job was licked. Industry was over the hump. Planning for postwar got a hearing denied to it up to that time. . .

"The postwar stake for those on the war fronts as well as for those at home is a vital one. It means rebuilding on a foundation already laid and not a complete rebuilding with all the confusion and disorder which might very well mean political as well as economic upsets. . .

"Boom will come . . . from those three stalwarts of the first World War—railroad rehabilitation, automobiles and housing—with added fillips from revolutionary synthetics such as nylon, rubber and plastics, the light metals, electronics, planes and new types of food."

►Echoing Industry's evident desire to have a large piece of the postwar planning pie, New York's Governor Thomas Edmund Dewey gave a generous share of his inaugural address last month to the question: ". . . we will face a problem of civic reconstruction. Three-fourths of our population live in cities which are deteriorating. Industry and population have been moving out of the central cities into expanding suburbs, leaving behind them vacant structures and blighted areas.

"To make our economy more efficient and life happier and healthier we face the need of rebuilding our cities. Whole obsolete business and residential districts will, in time, be torn down. There will be reserved to industry locations permitting efficient operation, together with the development of neighborhoods with their own civic, recreational and religious centers, and the preservation of broad spaces for parks and playgrounds.

"Business and industry must once again be attracted to our State. We shall, indeed, need the genius and productivity of private enterprise on a large scale. Full employment must be achieved in peace and the State of New York must maintain its prime position in the nation."

DECADE OF DIVIDENDS

A full house at any housing project is a commonplace nowadays, but the Buhl Foundation's Chatham Village (*see cut, p. 92*) in Pittsburgh was 97.5%-occupied in depression year 1932, 100% over since. This year celebrating the 10th anniversary of the opening of its first unit, the large-scale, singly-owned rental project has had:

►A consistent history of uninterrupted financial return. Started with $1,700,000 of Buhl Foundation money (Henry Buhl, department store merchant, died in 1927 leaving his estate "to the aid, need, and well-being of the citizens of the city of Pittsburgh"), Chatham Village provided 197 homes for white-collar workers on a rental basis. It showed an annual average net return, after all operating expenses, taxes and depreciation, of 4.32 per cent. Villagers paid $47.50-$87 a month for 5-9 room houses (a 6-room house cost $6,700 to build). At this rate the Foundation will be paid off in 31 years.

►An unusually high record of occupancy (as well as a long, selective waiting list).

(Continued on page 92)

G-E Wiring Material News

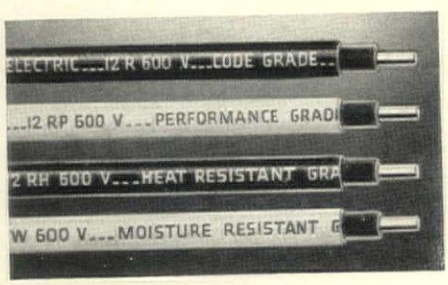
Specify G-E "MASTER NO-BLINK" FLUORESCENT STARTERS

This starter has many new features. It locks dead lamps out of the circuit. It eliminates *all* flow of current from the ballast thus preventing blinking under dead lamp conditions. No cooling period is required before replacing lamp. Moreover, the G-E "Master No-Blink" Starter reduces the number of replacement starters required. It will outlast all others.

Catalogs on POWER DISTRIBUTION SYSTEMS

Here are catalogs on two different underfloor distribution systems. Both systems make wiring extremely flexible. G-E Fiberduct is a fiber raceway for installation in concrete floors. G-E Q-Floor Wiring is used in cells of H. H. Robertson cellular steel Q-Floors. Outlets can be installed in the raceways wherever they are needed at any time with both systems.

4 Different G-E Building Wires



G-E building wires are high quality. They are carefully made of the best raw materials. Conductors are accurately centered. Wires are marked for easy identification. Four grades are available: Code grade, Type R; Performance grade, Type RP; Heat Resistant grade, Type RH; Moisture Resistant grade, Type RW. G-E building wires can be depended upon to give good service.

MAIL THIS COUPON

Send this coupon for free catalogs and for information on G-E products described on this page:

General Electric Company,
Section CDW2312-26,
Appliance and Merchandise Dept.,
Bridgeport, Conn.

Sirs:

Please send me information on
( ) G-E Master No-Blink Starter
( ) G-E Building Wire; or catalog on
( ) G-E Fiberduct; ( ) G-E Q-Floor Wiring.

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

GENERAL ELECTRIC

MONTH IN BUILDING

(Continued from page 90)

The Foundation claims this demonstrates "the advantages of social and economic security that are to be had from rental rather than purchase in a community managed from long-term investment viewpoint."

►An enviable record of maintenance of neighborhood standards through "sound planning, a good neighborhood reputation and a conscientious management."

At decade's end, the design team of Ingham and Boyd can pat themselves on the back as they look over their glowingly successful plans; Charles F. Lewis and directors of the Chatham Realty Company can pride themselves on ten years of successful operations.

Ewing Galloway

CHATHAM VILLAGE: 10 prosperous years

Vox Populi on Urban Planning

Coincident with Chatham Village's 10th birthday was the publication last month of *Urban Planning and Public Opinion*, the results of a survey by Princeton's Bureau of Urban Research. Revealed by this first national poll relating solely to the country's urban population were important public sentiments:

►Eighty-six per cent of the home-owning Americans questioned were glad they owned their homes. Ten per cent wished they did not.

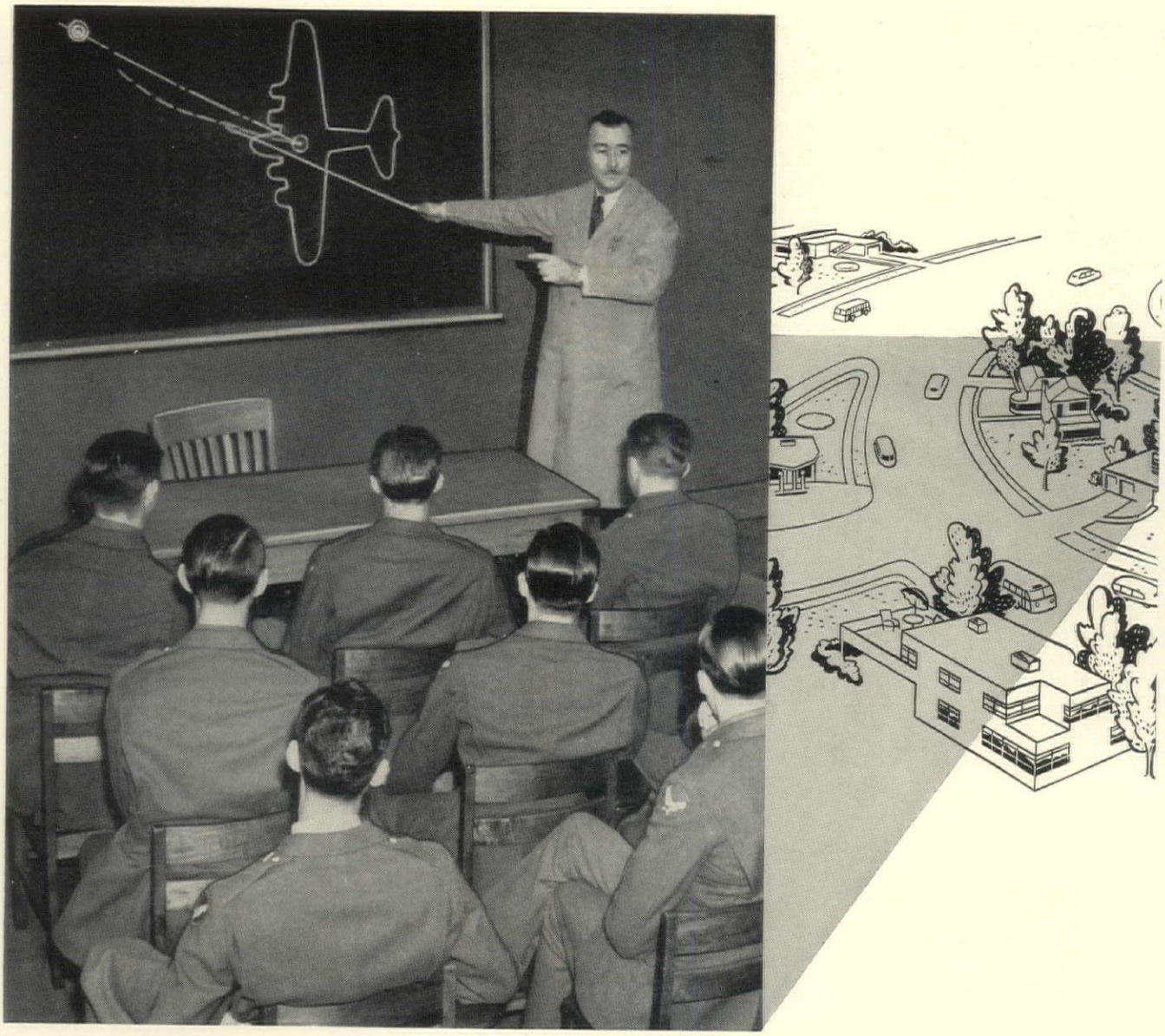
►Sixty-nine per cent were satisfied with the neighborhoods in which they lived. Twenty-four per cent were not (main reasons: dissatisfaction with class of people, noise).

►Thirty-four per cent reported a shortage of park and playground space.

►More than half (53%) have moved during the past 5 years (reasons: to live in a better location, to build or purchase a home).

Most significant fact emerging from the survey is in direct contrast to the Chatham Village thesis: Although over 50% of American city dwellers live in rental quarters, only 25% prefer this type of dwelling. Almost twice as many persons want to own a house as do at the present time.

(Continued on page 94)



BEAUTYWARE MEN HOLD CLASS

Before Pearl Harbor, Briggs field representatives were setting records for housing project installations. Now they are all engaged in Briggs war activities. Many of them are instructors in the Briggs Air Forces Technical Training Detachment.

At this school, hundreds of enlisted men are given an intensive training course in the installation and maintenance of gun sights and Briggs-made ball turrets for the famous Flying Fortresses.

In this and other jobs, Briggs skills and manpower are now dedicated completely to the task of winning the war. But ways to do things better are being taught and learned, assuring that the housing of tomorrow will have installations of even finer Briggs Beautyware formed metal plumbing fixtures. Briggs Manufacturing Company, Detroit, Michigan.

BRIGGS *Beautyware*
PLUMBING FIXTURES

MONTH IN BUILDING

(Continued from page 92)

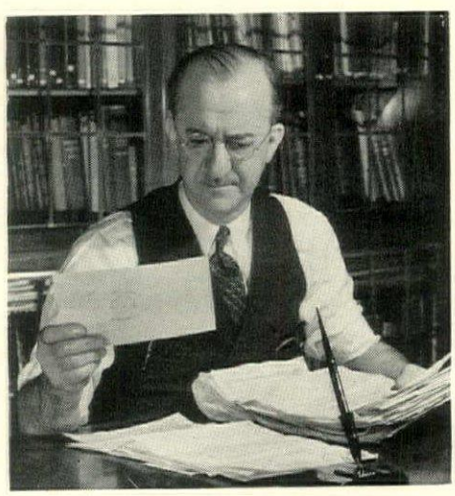
CONSTRUCTION AT WAR

In a well-documented, professional series of radio broadcasts, the Associated General Contractors of America has been presenting bi-monthly the problems and accomplishments of the construction industry. The quarter-hour programs are released through affiliates of the A.G.C. throughout the country.

To each program are invited key Washington and industrial figures (first three guests: the Army's Somervell, the Navy's Moreell, A.C.G.'s President Kimball). Now and then the dry facts of construction activity are presented with overtones of romance: A soldier shows his girl around his camp, boasts of its structural elegances. The master of ceremonies breaks in, points out that she and Private Jackson have other things than the camp to talk about, leads into a more martial description of record-breaking building of cantonments.

THE KAHN DYNASTY

Elected to the presidency of Albert Kahn Associated Architects and Engineers, Inc., this month was Louis Kahn, younger brother and lifelong (1908) associate of



LOUIS KAHN, successor to brother Albert.

the famed, late Albert Kahn. For many years secretary-treasurer and executive head of the corporation, shrewd, business-wise Louis Kahn will head the organization, assisted by vice presidents Sheldon Marston, George H. Miehls, and Robert E. Linton; secretary George K. Scrymgeour, treasurer Saul Saulson.

PLEA FOR PLANNING

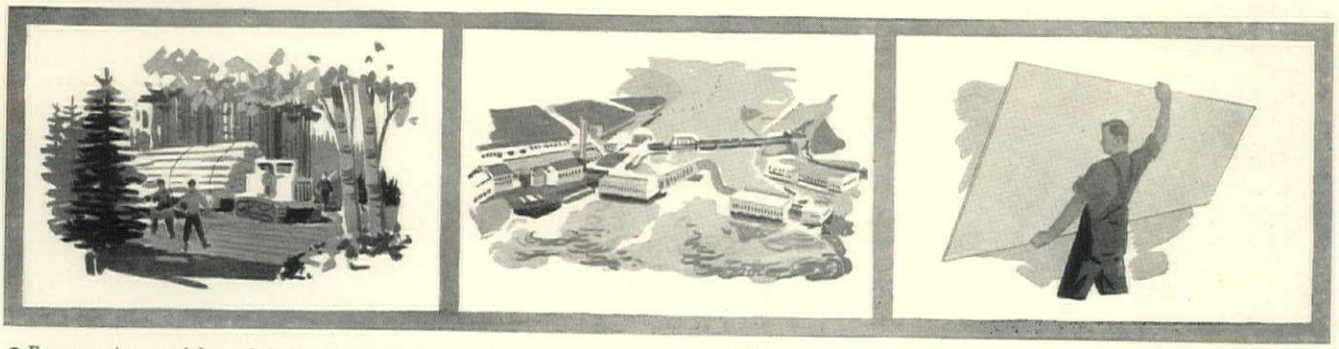
"Lenders find themselves in the unpleasant situation of financing their own funeral." This was but one of a long, grim list of urban problems which Miles L. Colean totaled last month before a sober gathering of the Mortgage Bankers Association in New York.

Colean, long-time housing student and

(Continued on page 96)

ONLY A NORTHWOODS TREE

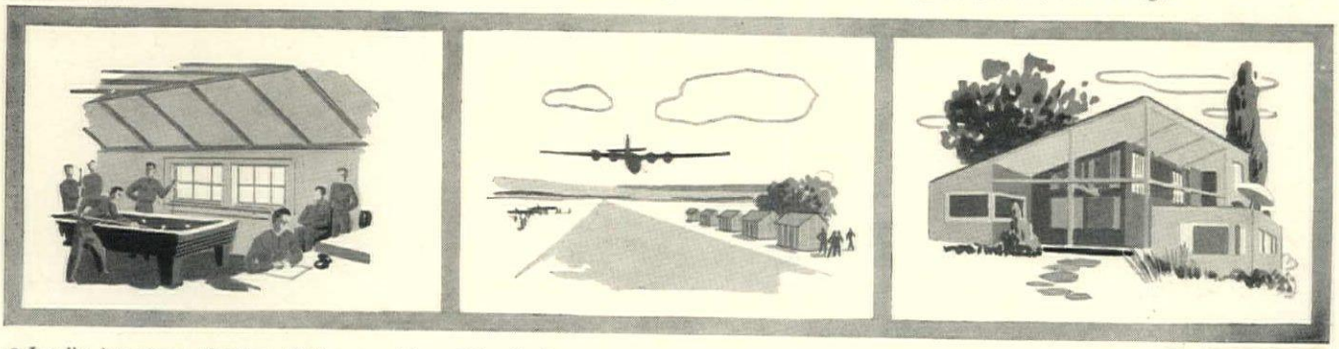
. . . . yet its fibres are the sinews of war as well as one of the comforts of peace . . .



● For centuries wood formed shelter for mankind. Used as lumber, wood built homes, factories and workshops. But more than a quarter of a century ago, modern science found that the *fibres* of wood could be transformed into materials of *wider adaptability* than wood as nature made it.

● Big logs were put into specially constructed machines that literally tore them to pieces—leaving only sturdy wood fibres. These fibres, the "heart of the wood," were then treated to resist the elements. Then the fibres were processed by a new method into panels of rigid strength.

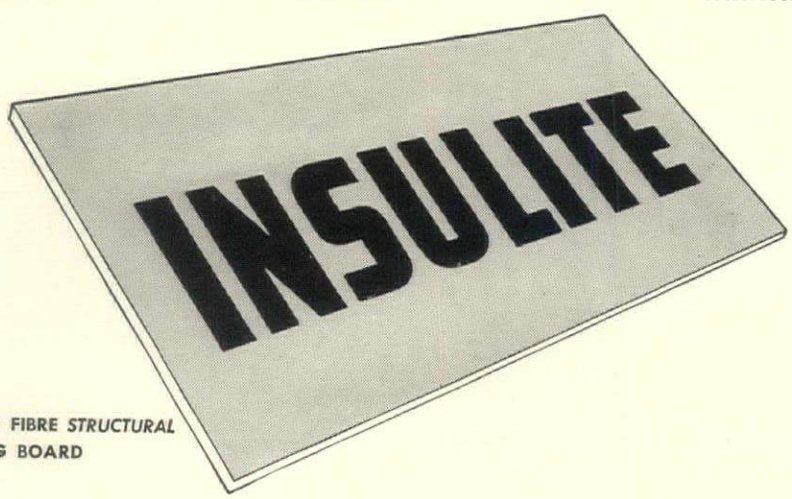
● The finished product—INSULITE. These panels or boards have great structural strength. They have high insulation efficiency, retarding the passage of heat or cold. They are moisture-proofed, wind-proofed, provide sound control, and are protected against termites, rot and fungi.



● Insulite has many *advantages*. Today, speed in construction is important. Large panels of Insulite are quickly applied, quickly nailed into place, thus saving precious man-hours. Many defense projects, cantonments and factories throughout the nation have been built in record time with Insulite.

● Insulite has many *uses*. It was used to build the gigantic set for King Arthur's Court on a Hollywood sound stage; it is being used today, throughout the world, to build warm, comfortable shelters for our fighting men, erected on the spot in only 90 minutes time.

● In home construction, Insulite finds its widest use. Walls constructed of Insulite are not only stronger, but they are also weathertight, wind-proofed, and are an effective barrier against extremes of temperature, saving fuel in winter, giving cooler rooms in summer.



THE *ORIGINAL* WOOD FIBRE *STRUCTURAL* INSULATING BOARD

MINNESOTA AND ONTARIO MANDO FOREST PRODUCTS PAPER COMPANY

Insulite Division of Minnesota and Ontario Paper Company
Minneapolis, Minnesota

MONTH IN BUILDING

(Continued from page 94)

administrator and now v.p. of Starrett Bros. and Eken, listed factors which, if unchecked, would accelerate the disintegration of all cities. And he made plain that these factors would continue unless immediate plans were laid to cushion their impact. Colean's list: declining growth of urban population undermining competitive position of old buildings; more widespread distribution of family incomes and reduced family debts plus easy credit encouraging movement to move to livable outlying areas; technological improvements in house building making the new house easier and more attractive to buy; new war plants within metropolitan areas but outside city limits will attract industry and workers' houses; lower suburban taxes and low land prices combined with good, cheap transportation; difficulty of assembling large in-city tracts suitable for large-scale development; restrictive city building codes and zoning regulations; doubtful future of public housing programs to take over costly land in blighted city neighborhoods.

Colean concluded, "Unfortunately, the words words 'plan' and 'planning' have fallen on evil days. They are apt to bring up a picture of determined and not always realistic zealots who would use the powers of government to force upon us their own notions of how the country should be run. The terms have come to imply control by the government for the sake of control, or at least without clear reason as to the necessity of control or assurance as to the purpose for which it is exercised. But if we have this sort of planning, established at the top, it is due to the neglect of a more democratic type of planning which springs from the common consent as to what is desired and as to the means of reaching the desired end. Call it by any name you will, planning is as essential to the safe conduct of our economic life as it is to our military campaigns. The questions are who shall do the planning and what shall we plan for. We can all agree, I think, on the broad objective—cities that are pleasanter to live in, more convenient to work in, more economical to maintain. We want to see an end of the confusion, duplication, and waste of municipal administration and of the chaotic financial situation in which most central cities find themselves. We want to see, if not a recovery, at least a stabilization of urban land values at a point where redevelopment will be possible. We want to halt the rapid and spreading depreciation of urban districts. We want to secure an adequate supply of good housing for those who seek to own and for those who either desire to or are forced to rent their dwellings."

Back to their offices went the mortgage men to ponder, and, perhaps, to plan.

LETTERS

(Continued from page 20)

persons have made a very real contribution to Tacoma's future, and if we are qualified to further their work we shall begin to follow a long-range program which will be so much better than living from year to year as we have insisted on doing in those decades which have gone by.

I am anticipating the coming year of 1943, for it is likely to determine to what extent we can outline our needs for the next ten or twenty years. . . .

HARRY P. CAIN, MAYOR

Tacoma, Washington, D. C.

CRITICAL MATERIALS

Forum:

Your December issue is an inspiration, as all your issues are, to men who desire to make something better and certainly something cheaper in price to house the American people after the war is over. These men, through necessity, are following now the lines of least resistance but do not want to lose sight of the fact that they must improve their present techniques in a large manner to justify their place in building. These men are struggling now with a war foundling called, for lack of a better name, prefabrication.

It seems to me that their, or rather our, problems are chiefly four: first, a lack of substitute materials for manufactured articles such as plumbing fixtures, pipe, heating units, expensive metal hardware, etc., second, flexibility of architectural design to blend with shop production, third, distribution and sales problems, and fourth, public acceptance and lack of responsible intelligent sponsorship.

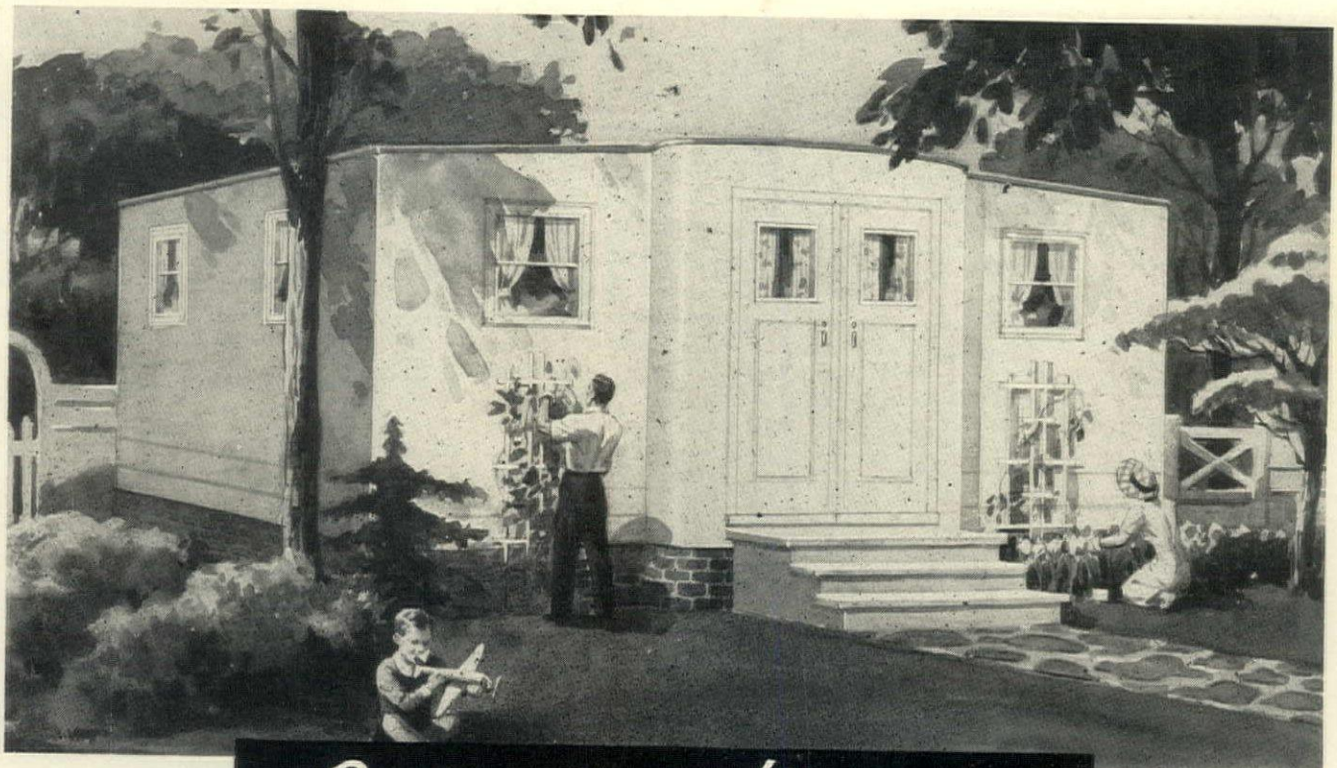
A magazine such as yours, and I know of no better in the field, whose editors seem to have faith in the future of this little industry, could do a great deal to solve these problems in a material way.

I have this in mind: many building materials manufacturers have developed recently substitute products for the old conventional items used in a house before Pearl Harbor but no one has ever attempted to merge these products into one unit. Why not take a list of "critical" materials and other items still used which have outlived their usefulness in their present form and canvass these progressive manufacturers for substitutes for these items, assemble these items in a new housing unit. . . .

WILLIAM J. LONNQUIST

Chicago, Ill.

The critical materials situation is not static. By the time reader Lonnquist's proposed research could be completed changes in the situation might invalidate the entire study. —Ed.



Industrial Housing
SUPPLIED ALMOST OVERNIGHT

"PALACE" TWO-FAMILY DWELLING UNIT

Factory-Built and Factory-Assembled

Completely Equipped with Plumbing, Heating, and Electric Wiring

•

Also Bathroom and Kitchen Equipment, With Hot and Cold Running Water

NO longer is it necessary to wait for weeks and months when additional homes are required to meet emergency housing needs. The period of waiting has now been reduced to the length of time it takes for a fleet of motor trucks to travel from factory to building site.

Within 3 hours after an expansible Palace Dwelling Unit is delivered at its destination, it is ready to house two families—each apartment completely provided with furnishings as well as heating and cooking equipment.

If you anticipate a need for additional housing facilities because of prospective plant expansion, investigate how Palace Portable Dwelling Units will quickly solve your problem. Plan in advance by writing today for literature.

Transported by Motor Truck from Factory to Building Site

•

Delivered Complete With Furniture, Draperies and Floor Covering

Palace Travel Coach Corporation
Flint, Michigan

Palace TRAVEL COACH CORPORATION

FORUM OF EVENTS

(Continued from page 4)

ANNOUNCEMENTS

Sidelight on manpower shortage—the Department of State has suspended for the duration the award of official scholarships, fellowships and travel or maintenance grants to students from the U. S. for study in other American Republics. Reason: "most of the persons who would otherwise be eligible . . . will be engaged in the armed forces of the Nation, in the manufacture of war materials, or in other activities closely related to the war effort." Hospitably, however, the Secretary of State has emphasized his hope that other American countries will permit the continuance of these awards to their citizens for study in the U. S.

The *Posters for Victory* Exhibition—350 out of the 2,200 entries in the National War Poster Competition sponsored by R. Hoe and Company—has started a nationwide tour of major U. S. cities. The posters, first exhibited at New York's Museum of Modern Art, are dramatic testimonials to Axis cruelty, the dangers of loose talk, the vital role of civilian sacrifice and maximum production for the war effort.

EDUCATIONAL

The U. S. Army, now the biggest landlord in the nation, is necessarily concerned with housing its troops in camps and hotels that are efficiently and economically heated. To give Army combustion engineers streamlined knowledge of ways and means, a selected group of officers have been sent to a school operated by the Brown Instrument Division of the Minneapolis-Honeywell Regulator Company. At the Brown school, which has been teaching the use of industrial instruments to war plant and ordnance workers, the officers have been trained in the use and maintenance of such instruments as flow meters, which measure the output of steam boilers, CO_2 meters, which control combustion by analyzing the amount of gas to leave the fire box, and Protectoglo, a safety device which stops the flow of gas to a burner in case of flame failure.

War and Post-War Housing, a 12-week seminar for advanced housing students, will be given at the New School for Social Research, in New York, beginning January 18 under the direction of Charles Abrams, consultant to the o.d USHA.

DIED

Sir Reginald Blomfield, 86, architect, in Hampstead, England. Sir Reginald, ex-president of the Royal Institute of British Architects and principal architect

(Continued on page 102)

Only a very brave man will venture in these days to make definite long-range forecasts. However, some of the outlines of the post-war world picture are beginning to take form.

If the war is not too long and we do not shirk the responsibilities of political, financial, and economic leadership, there will be firm basis for the hope that the return to peace-time production can be accomplished without sacrifice of American ideals. Private enterprise should have its chance, as it always has had in this country, although no doubt it will necessarily be subject to controls for a considerable period of time.

A tremendous demand for homes of small and medium size will certainly exist. If the war is short, that demand may become effective through the ability of the individual to use his savings, with ordinary financing, to provide a home for himself. If the war is long, the Federal Government will probably devise means by which the necessary housing can be provided for the people.

The adjustment to a war economy has brought many new problems to our Company, but we are not altogether forgetting the post-war period. Plans and policies are under consideration, but not far enough advanced to make any announcement at this time. American industry will come out of the war with new and improved products and our Company will endeavor not to be an exception to that rule. Whether new methods of construction will largely take the place of old, we do not know; but in any case, there will be need of woodwork in residential construction and our products will be designed and produced to meet the requirement, whatever form it may take

Naturally, in accordance with established Curtis policy, whatever our program may be, it will be built with maximum regard for the interests of distributors of Curtis products.

G. L. CURTIS

PRESIDENT, CURTIS COMPANIES INCORPORATED

CLINTON, IOWA

A message of confidence . . . A statement of policy

This statement comes from a man who *knows* the building industry, and who speaks with the authority gained from many years of contact with the trade. His words are not only a definition of Curtis policy, but a message of confidence and reassurance for lumber dealers, builders and architects everywhere.

1866 CURTIS WOODWORK

FORUM OF EVENTS

(Continued from page 100)

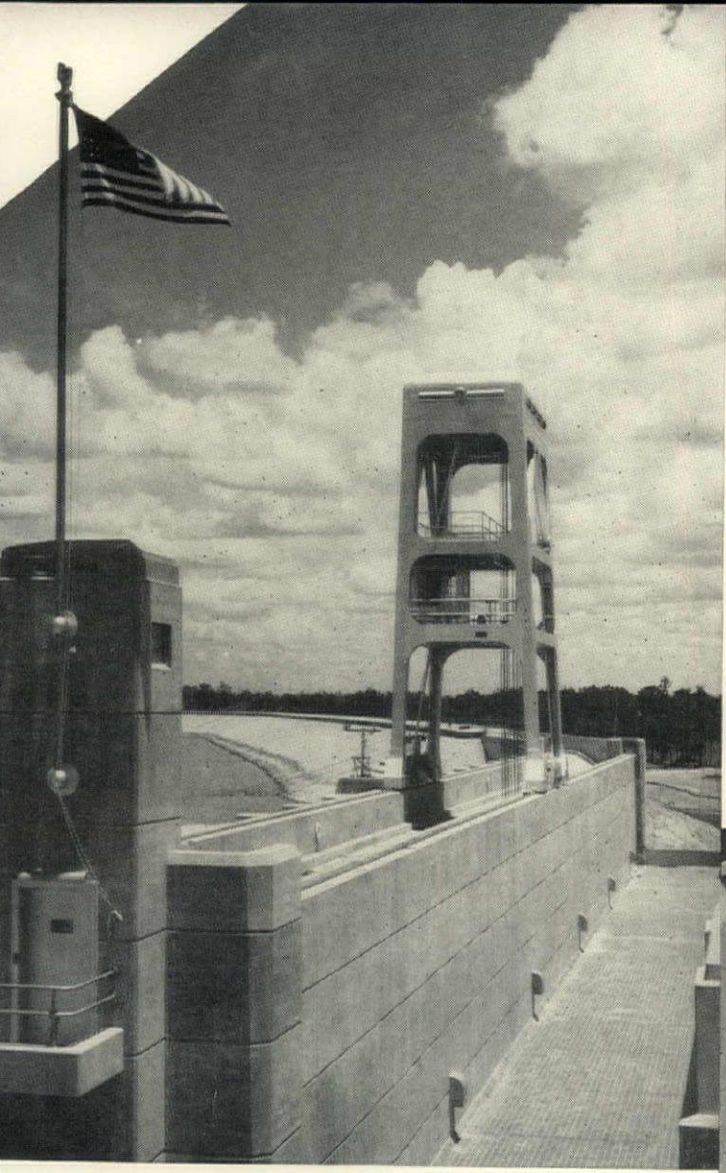
of the Imperial Graves Commission, designed the famed Menin Gate at Ypres. The Menin gate, officially opened in 1927, is a memorial to those who died at Ypres during the First World War. The structure has been so designed that it forms a part of the defense of Ypres. Sir Reginald was also responsible for the reconstruction of Sulgrave Manor, George Washington's ancestral home.

FRANK N. DODD, 72, former realty official, in New York City. For forty-two years secretary of the Metropolitan Opera and Real Estate Company, Mr. Dodd represented stockholders who owned the Opera House Building. He retired in 1940 when his company sold the Opera House to the Metropolitan Opera Association.

NICK F. HELMERS, 59, contractor, in New York City. Mr. Helmers, former president of the Associated General Contractors of America, was an authority on heavy construction and difficult deep water foundation work. He was president of the Siems Spokane Company of Spokane, vice-president and general manager of Siems-Helmers Inc. of St. Paul, and chairman of the board of the Orin P. Bailey Company of St. Paul from 1931 to 1938. While with the Bailey Company Mr. Helmers directed the construction of the Huey P. Long Bridge in New Orleans, and used his own Sand Island patent in the sinking of the piers, which engineers believe to be among the deepest in the world. Three years ago Mr. Helmers came to New York where he established his own company, engaged in the construction of several projects in South and Central America, and, since the war, in overseas projects for the War Department.

NORMAN MORRISON ISHAM, 78, architect and author, in Wickford, R. I. An authority on early American architecture, Hartford-born Isham taught at Brown University, from which he was graduated in 1886, and at the Rhode Island School of Design, was at one time consultant in full charge of the Colonial Room in New York's Metropolitan Museum of Art. He was the author of several works that have become classic in their field—*Early Rhode Island Houses*, which he wrote with Albert F. Brown, *Early Connecticut Houses*, and recently, *A Glossary of Colonial Architecture*. Mr. Isham was a member of the A.I.A. Rhode Island Chapter, and received a testimonial from them in 1936, and in 1940 a bronze plaque for his "distinguished service" in restoring the Gilbert Stuart snuff mill at North Kingstown.

(Continued on page 104)



Top of powerhouse at Santee-Cooper power and navigation project 50 miles north of Charleston, S. C.

Concrete provides rugged strength *for* war structures

WHERE rugged strength and appearance in keeping with the function of a structure are demanded, architectural concrete meets all the requirements.

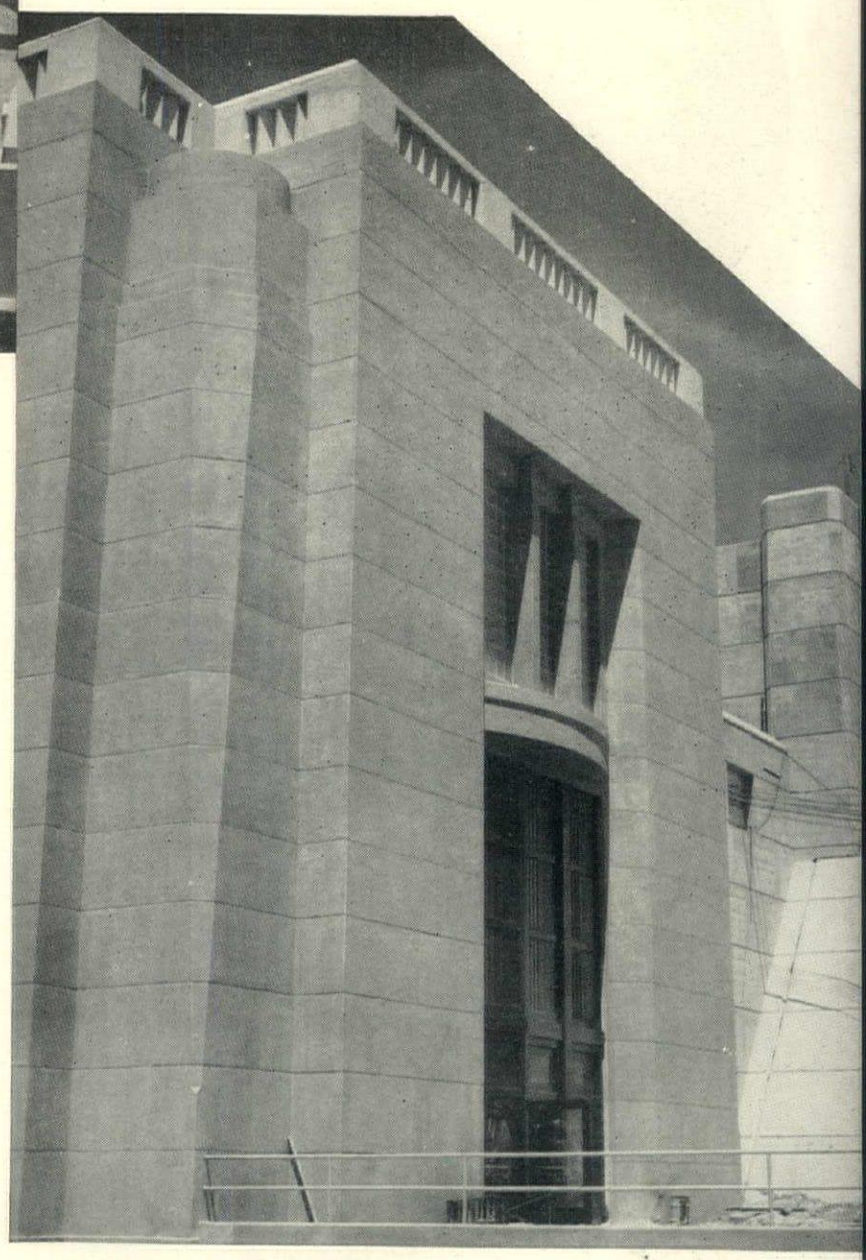
Designers of the huge Santee-Cooper power project used architectural concrete, placed in forms with absorptive lining.

The unique adaptability of architectural concrete is being demonstrated every day by its use in army depots, aircraft factories, hangars, munitions plants, warehouses and power plants. Availability and speed of construction make concrete a logical material for war projects. With this versatile material, sturdy, firesafe, low maintenance structures of good appearance are created at relatively low cost.

Technical assistance in solving problems related to concrete construction is available to architects and engineers engaged in war projects or any essential building. See Sweet's Catalog, 4/33.

PORTLAND CEMENT ASSOCIATION
Dept. A2-7, 33 W. Grand Ave., Chicago, Ill.

A national organization to improve and extend the uses of concrete . . . through scientific research and engineering field work



Rustication lines give scale to mass walls of Santee-Cooper powerhouse. Building designed by Harza Engineering Co., Chicago. Built by Central Engineering Co., Davenport, Iowa.

Buy more war bonds

FORUM OF EVENTS

(Continued from page 102)

ROBERT MACDONALD, 67, architect, in Montreal. Mr. Macdonald, who was born in Melbourne, Australia, helped design some of Canada's leading hotels (the Royal York Hotel of Toronto, the Mount Royal of Montreal, the Hotel Saskatchewan at Regina, the Macdonald at Edmonton) as a partner in the architectural firm of Ross & Macdonald. His firm also designed other well-known buildings—the Royal Bank Building and the Union Station in Toronto, the Y. M. C. A. buildings in Montreal and Kitchener, Ontario, and the Homeopathic Hospital in Montreal.

FRANK CALVIN ROBERTS, Sr., 81, civil engineer, in Philadelphia. New York-born, Princeton-educated Roberts, whose professional activities took him to Canada, Great Britain and Spain, helped design and construct the Curtis Publishing Company Building, the first section of the Bulletin Building and the Public Ledger Building, all of Philadelphia, and buildings for the Lehigh Valley Railroad. He designed 75 iron and steel plants, and more than 100 blast furnaces for such companies as the Jones & Laughlin Steel Company, of Pittsburgh; Sheffield Coal and Iron Company, Alabama; Frodingham Iron and Steel Company, of England.

FRANK SEARS SENIOR, 66, civil engineer, in Montclair, New Jersey. From 1899 to 1929 associated with Arthur McMullen Company, and in 1929 founder of Senior & Palmer Inc., construction contractors, Mr. Senior specialized in the construction of railway spans and pneumatic foundations. Under his direction foundations were built for bridges spanning the Susquehanna River at Havre de Grace, Md., the Missouri at Pierre, S. D., the Monongahela at Pittsburgh, the Hudson at Castleton, N. Y., and the Delaware at Trenton, N. J.

PERSONAL

V. GILMORE IDEN has resigned as Secretary of the American Institute of Steel Construction, New York City, to become the Industrial Editor of the Bureau of National Affairs, Washington, D. C.

The American Standards Association announces that CAPTAIN ROBERT V. LABARRE, consulting foundation engineer of Los Angeles, has been appointed a member of the Association's Subcommittee on Building Code Requirements for Excavations and Foundations, and that OTTO V. KLOPSCH of the Wolverine Tube Division of the Calumet and Hecla Consolidated Copper Co., has been appointed a member of the Subcommittee on Minimum Requirements for Plumbing and Standardization of Plumbing Equipment.

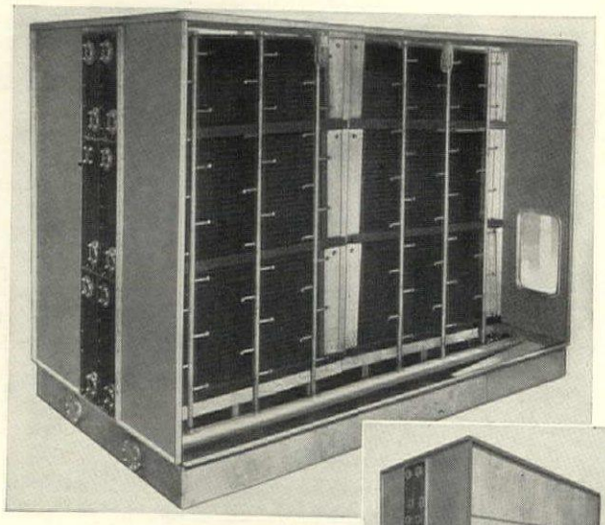
War Department's new Pentagon Building. Built under direction of Corps of Engineers, U.S. Army. Heating Contractors, Baker-Smith & Co.; Nehring & Hansen Co. Modine Dehumidifier Units built to specifications of Chas. S. Leopold, designer of air conditioning systems.

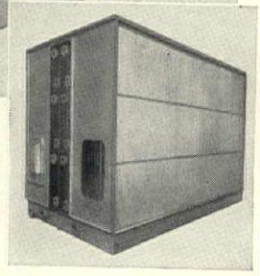
modine-built DEHUMIDIFIERS equipped with....

modine

STEEL COILS

help Air Condition The PENTAGON





(*above*) Dehumidifier (*air intake side*) Unit consists of a sheet metal enclosure housing from 4 to 24 Modine Steel Cooling Coils (depending on size of unit). On inlet side of coils a series of nozzles spray water over the coils.

(*right*) Dehumidifier (*air outlet side*). After the air leaves the Modine Cooling Coils, excess water is removed from it by eliminator plates built into the unit.

ALL-STEEL CONSTRUCTION—Both condenser and casing are steel—from stem to stern.

METALLIC BONDING—Steel fins permanently bonded with metal to steel tubes—prevents intra-corrosion, preserves original heat transfer capacity.

TO PROTECT STEEL FINS AGAINST CORROSION——thus preventing them from rusting and becoming rough and thickened—Modine dips complete welded and brazed coil assembly into a lead-alloy bath.

DIE-FORMED FINS promote greater heat transfer; permit a Modine Coil of smaller size, less weight and fewer fins per inch, to have the same capacity and air resistance as a larger coil using the conventional flat fins.

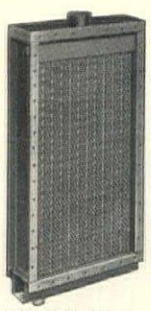
HEAVY STEEL TUBES AND PARALLEL HEAVY BRAZING enable condenser to resist differential expansion. "Floating" Return Header absorbs overall expansion.

MODINE STEEL COILS

now available for

WAR WORK PROJECTS

Look in your phone book for Modine representative's name—"Where to Buy It" section under Heating Apparatus.



Modine Blast Heater

MODINE STEEL COILS

in heating, ventilating, air conditioning systems are not only bringing new and greater comfort to governmental buildings, army cantonments, air and naval bases, ordnance works, Navy combat and auxiliary ships, Maritime Commission cargo ships, and war industry plants...They are accelerating industrial production and food dehydration *in processing and drying systems.*

WRITE FOR LITERATURE

MODINE MANUFACTURING CO., 1736 RACINE STREET, RACINE, WISCONSIN

BOOKS

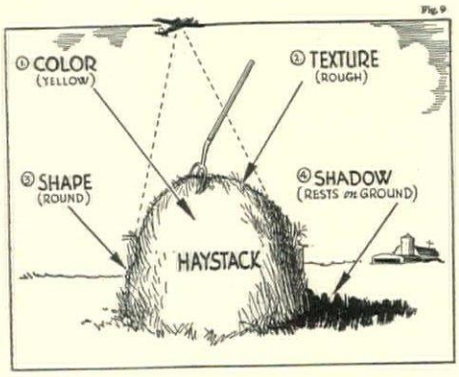
(Continued from page 14)

an independent and critical attitude. While designed to meet the requirements of a lay audience, the material is so extensive and varied that most architects will find a great deal of valuable information. Since the modern residential architect is often expected by his clients to be as useful in the selection of colors and drapery fabrics as he is in specifying materials and equipment, the book is an excellent guide. There is a bibliography—and a complete index, a list of outstanding architects and designers. In addition to the black and white illustrations there are a number of plates in color.

CAMOUFLAGE SIMPLIFIED, By Eric Sloane. The Devin-Adair Co., New York. 60 pp., 34 plates. 8x11. $2.50.

Some time ago Mr. Sloane, who is an artist by trade, put out a book on meteorology, in which he used a newspaper cartoon technique of drawing to tell most of his story. The result was an amusing, easily understood book on a subject normally considered too technical for such a presentation. This new book on camouflage uses the same technique very successfully. The author starts off with the statement that "this book contains no military secrets." He might have added, too, that it contains little or nothing that has not already appeared in other standard books, such as *Modern Camouflage* by Lt. Col. Breckenridge. It discusses the theory of recognition and concealment in nature. It analyzes the problems of aerial observation. It estimates the relative importance of color, textures, shadows, etc., and deals with smoke for concealment, blackouts, and the construction of decoys. All of these subjects, of coures, are familiar—not only to the expert, but to anyone who has taken the time and trouble to peruse any of the common references.

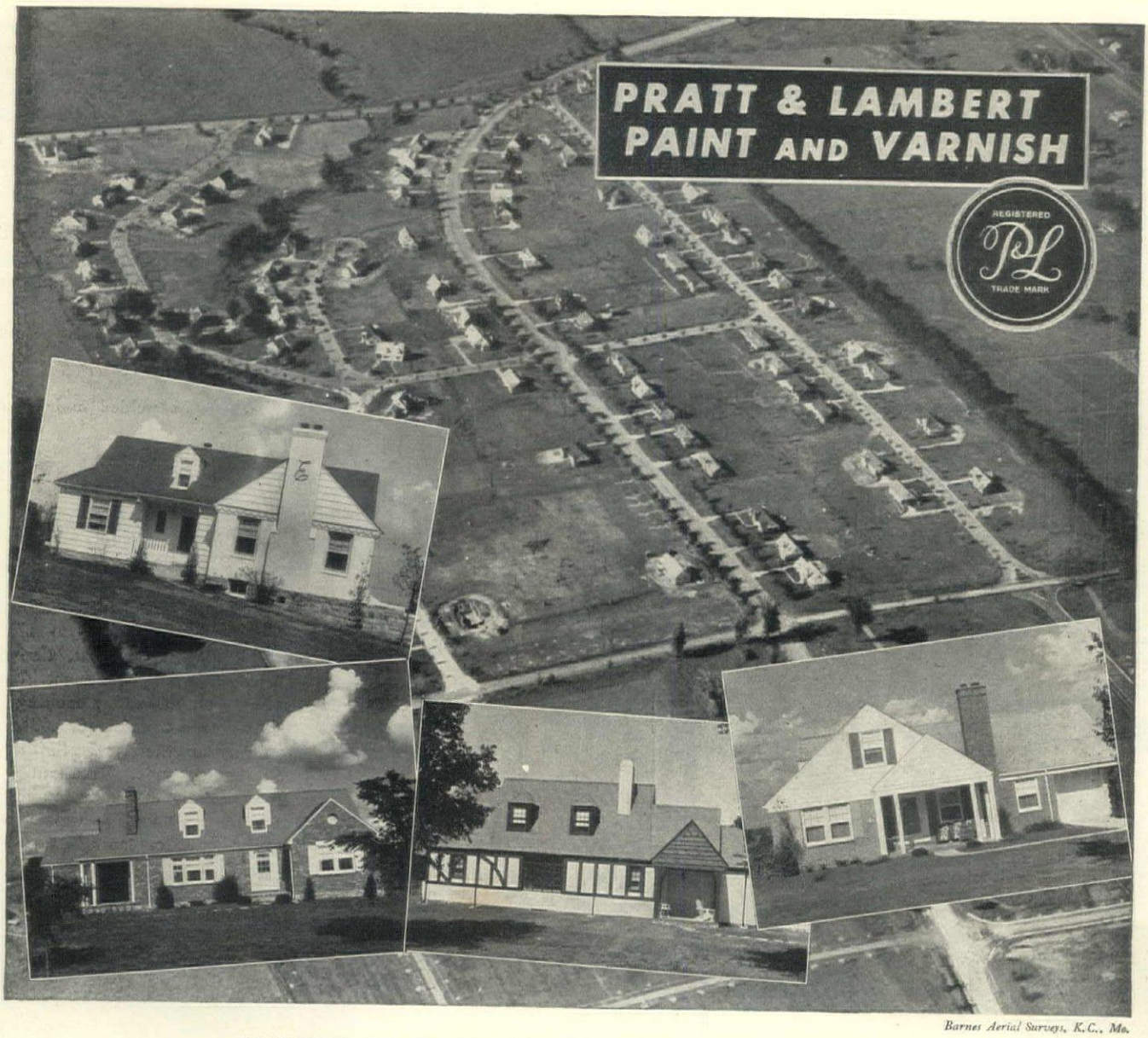
The great difference between this and other books which cover the same subject lies in the technique of presentation, and it must be admitted that this technique speeds up reading time by several hundred per cent. The illustration of the haystack, for example, immediately conveys a very



good idea of the basic problems of camouflage, which involve not color alone, but also texture; not only the plan shape, but the vertical projection as well, and the shadows it produces. Mr. Sloane has a very good understanding of his subject, and he has succeeded in packing an astonishing amount of useful information into each of his drawings. To those interested in getting a general idea of what camouflage is all about in the shortest possible time, *Camouflage Simplified* is the best answer that has yet appeared.

THE FOREST FIGHTS. Timber Engineering Company, Inc. 47 pp., illustrated. 9 x 12.

This booklet was put out as a general promotion piece, showing the uses of wood in the current war program, in housing, in industrial buildings and at the fighting fronts. There are about 200 photographs which give a remarkably complete picture of the tremendous number of current applications for the material, and a very convincing explanation of the shortage that has developed. Illustrations range from ships and hangars to wood rifle stocks, crates, truck bodies and machinery patterns.

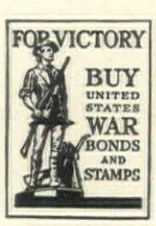


Barnes Aerial Surveys, K.C., Mo.

LEAWOOD DEVELOPMENT, JOHNSON COUNTY, KANSAS
HERBERT E. DUNCAN, ARCHITECT · KROH BROTHERS, INC., BUILDERS

TYPICAL of the homes built by Kroh Brothers, Inc. in their various developments, is this group of houses in the Leawood district, Johnson County, Kansas. These substantial homes are designed for folk seeking a permanent residence in suburban areas. Accessibility, modern utilities, pleasing decoration and landscaping are factors which help to make these houses easier to sell.

The use of Pratt & Lambert Paint and Varnish in decorating these houses is another practical illustration of how well P&L materials fit into all types of housing projects in the United States and Canada. P&L Paint and Varnish are economical because they save time, labor and coats, yet provide maximum beauty and protection. Ask the P&L Architectural Service Department nearest you to show you the advantages of close co-operation on your projects, regardless of their size.



PRATT & LAMBERT-INC., Paint & Varnish Makers
NEW YORK · BUFFALO · CHICAGO · FORT ERIE, ONTARIO

Building Reporter

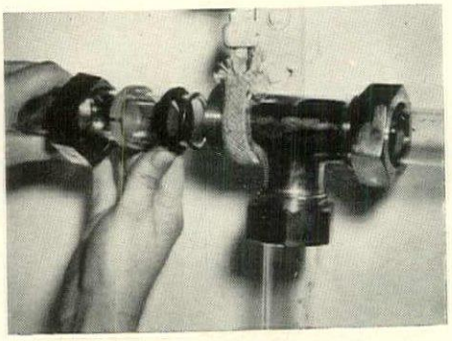
(Continued from page 8)

GLASS PIPE. Beaded-end glass piping developed to relieve metal shortage in dairy industry.

Name: Glass Sanitary Piping.

Purpose: To meet dairy pipe line requirements, including sanitary considerations.

Features: It is now possible to use regular Pyrex Tubing in place of metal piping. Means have been developed for securely connecting glass tubing to standard sanitary metal fittings such as elbows, tees, valves, etc., which will probably be made



available in limited quantity. This glass-metal combination is easily demountable and readily cleaned. Tests have indicated that its smooth, hard surface remains intact indefinitely—consequently, there is no formation of pits that could hold bacteria, yeast or mold, and no accumulation of milkstone deposits, films and scale. By using simple, portable equipment, the tubing can be cut accurately to the desired length, then fused and annealed in the field, so that ordinary dairy workmen can make initial installations and quick repairs using glass tubing from local stocks. Joint construction not only withstands dairy-service pressures, but is more flexible than the all-metal joint and stands up well under vibration.

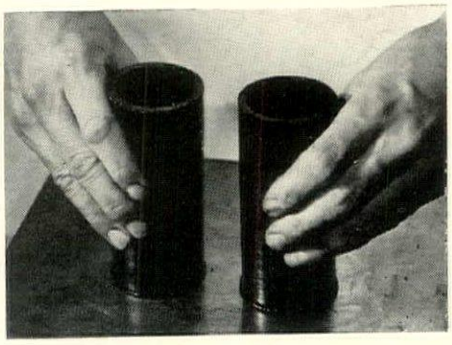
Manufacturer: Corning Glass Works, Corning, N. Y.

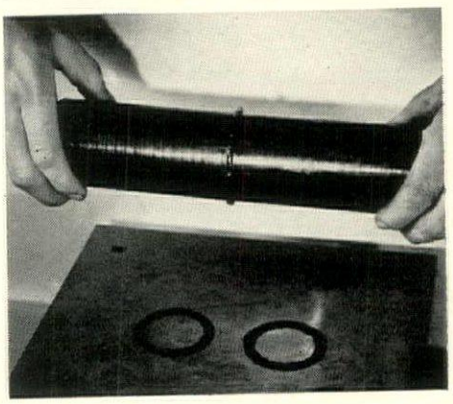
PLASTIC PIPE can be welded in less than one minute.

Name: Saran Plastic Pipe.

Purpose: To replace strong steel pipe.

Features: Made of a thermoplastic resin, Saran Pipe is light in weight, tough, durable, flexible, nonscaling and resists abrasive and corrosive actions of soaps, oils, chemicals and moisture. It withstands freezing and heat up to 175°F. Can be welded, heated, bent, threaded with standard plumbing equipment. Welding can be accomplished by melting the ends slightly on a hot plate (350-400° F.), pressing firmly together, and allowing to cool for a few seconds. Resultant joint is as strong as any other portion of the pipe. In the field it can be welded with use of a gas flame or torch heated unit.





* Dimensions are identical to those of extra strong iron pipe up to 2 in. dia., larger sizes promised soon. Standard flanges available in same size range; other fittings available soon.

Manufacturer: Dow Chemical Co., Midland, Mich.

(Continued on page 110)

Pentagon Bldg., Arlington, Va., U. S. War Dept., Archts., Edwin Bergstrom, Cons. Archt. Alberene Stone used for 5 stairways; Alberene Soapstone photo-developing tank equipment.

U. S. Naval Hospital, Bethesda, Md., U. S. Navy Dept., Archts., P. P. Cret, Cons. Archt.; Alberene Black Serpentine Exterior Paneling, Alberene Stone Laboratory Equipment, and Alberene Stair Treads and Platforms.

Versatile, durable Alberene Stones

FIND MANY USES IN THE GOVERNMENT'S PERMANENT PROGRAM

OTHER TYPICAL WAR CONSTRUCTION INSTALLATIONS

SHOWER COMPARTMENTS

U. S. Navy Yard Barracks, Phila., Pa.; George W. Pepper, Jr., Archt. U. S. Naval Aircraft Factory, Phila., Pa.; Ralph B. Bencker, Archt.

STAIR TREADS

Fort Belvoir, Va., Baskervill & Sons, Archts. The White House, Washington, D. C., Lorenzo S. Winslow, Archt.

FOOD BARS

U. S. Naval Aircraft Factory, Phila., Pa., Ralph B. Bencker, Archt. (Black Serpentine)

SINKS AND TANKS

U. S. Naval Photographic Laboratory, Anacostia, Md. Eastman Kodak Co., Engineers.

FUME HOODS

U. S. Naval Research Laboratory, Anacostia, Md.

Three factors account for the widespread use of versatile Alberene Stones in War construction, i.e. (1) proven durability, (2) availability, and (3) economy.

Alberene Soapstone has been standard equipment for fine laboratories for over 50 years. Highly resistant to acid and alkali, with no surface glaze, dense and tough, it is easily machined... and easy to keep clean.

Alberene Tread Stock is selected stone of great hardness. Its natural highly-toothed surface remains non-slip whether wet or dry.

Alberene Black Serpentine has become extremely popular because its polished black surface affords excellent contrasts for modern design. Highly resistant to weather action, the use of thin sections (7/8 in.) makes for economy.

We are ready and able to make prompt shipments of these various stones. Your inquiry will receive immediate, executive attention.

ALBERENE STONE

MODERATE IN COST...NEGLIGIBLE IN UPKEEP

ALBERENE STONE CORPORATION OF VIRGINIA, 419 FOURTH AVENUE, NEW YORK, N. Y.

Quarries and Mills at Schuyler, Virginia ★ Sales Offices in Principal Cities

Building Reporter

(Continued from page 108)

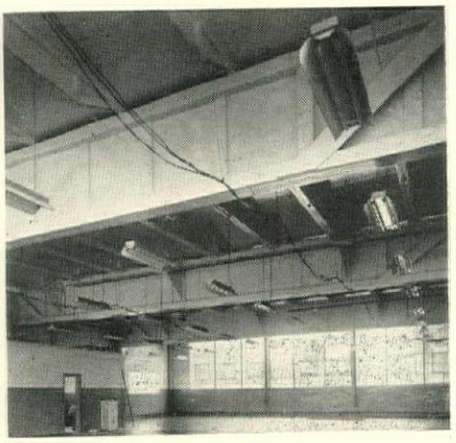
STRUCTURAL WOOD BEAMS. Factory-fabricated wood I-beams replace steel.

Name: Timbeam.

Purpose: Practical substitute for structural steel beams.

Features: Timbeam is a system of wood-structural framing based upon a wood plate girder beam, supplementary joists and purlins and wood H-columns. Owing to its conventional I- and H-shapes, it lends itself to framing in much the same manner as steel shapes and is in some cases even more versatile because it can be nailed. The working fibers are placed so as to deliver maximum work with the least sectional area. Dead loads due to beam and column weight are from 20 to 40% reduced, with the same strength obtained. Ends are tied with a diagonal tie from bottom to top flange to resist tension and shear at these points. Bearing and shear areas are computed from the safe crushing strength of the wood used. Flange and web members are glued together and doweled with maple dowels. All splices and connections are made with split ring connectors. Shop-fabricated to size and length from standard plywood and standard size lumber. Treated with wood preservatives; may also be treated to increase fire resistance. Spans as long as 60 ft., 5 ft. deep, are capable of sustaining a load of 1,500 lbs. per lin. ft.

Manufacturer: Timbeam, Inc., 3255 Goldner, Detroit, Mich.



WOOD SHELVING. New line is completely flexible, practical, requires no hardware to install shelves.

Name: Ivelock Shelving System.

Purpose: To provide adjustable storage space without use of critical materials.

Features: Because of the new positive patent lock-fit, it is easy to slide shelves in at any level (as close as 6 in.). Grooved splines for inserting bin dividers are optional. When shelf or bin divider is no longer needed, it can be removed and a smooth level surface achieved by inserting a solid spline. Units (shipped knocked down in corrugated cartons) are made of selected solid oak, poplar or clear pine, with shelves and finish side ¾ in. thick; divider side (for continuous rows) 1⅛ in. thick; back ¼ in. gum plywood. All surfaces are treated with dark green sealer-stain. An oilproof lacquer coating is extra. Dimensions of unit illustrated: width 36 in.; height 84 in.; depth 12 to 30 in. Also available is a complete line of light, sturdy, demountable wood lockers in a variety of styles and sizes.

Manufacturer: Ivel Corp., 211 West 61st St., New York, N. Y.

WOOD VENTILATOR for farm buildings.

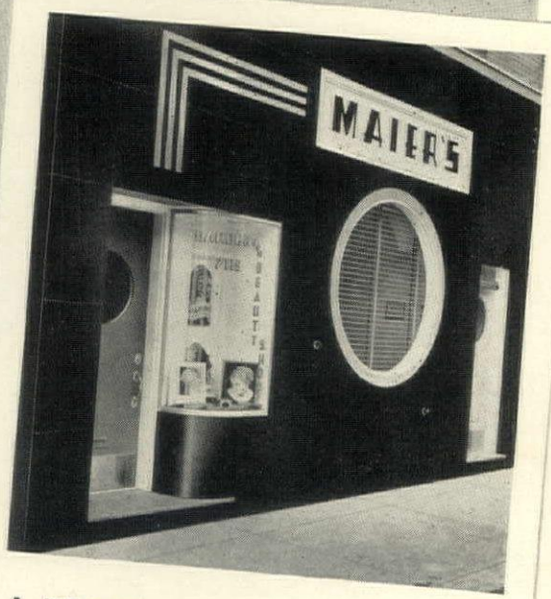
Name: Wood Ventilator.

Purpose: To eliminate need for metal.

Features: Ventilator can be manufactured economically by woodworking establishments from short pieces of standard lumber with precision jigs which will be made

(Continued on page 112)

NEWS ABOUT GLASS from "Pittsburgh"



A DESIGN WORTHY OF NOTE

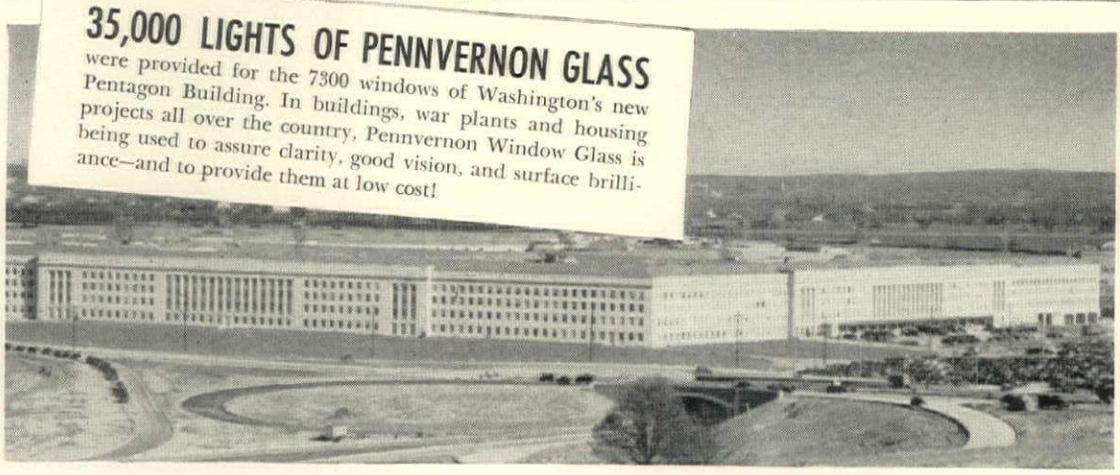
is this beauty shop front by Architect R. Maurice Trimble. Simple, modern, highly attractive. This design is well worth saving in your file for reference when building restrictions are lifted.

NEW! TUBS OF TEMPERED CARRARA GLASS

Ideal for defense housing projects. No priority materials are required in the tub's construction. Cost is low. Comes in a variety of beautiful colors. Will prove popular with house occupants, especially where children are too small to use showers. Available for immediate shipment.

35,000 LIGHTS OF PENNVERNON GLASS

were provided for the 7300 windows of Washington's new Pentagon Building. In buildings, war plants and housing projects all over the country, Pennvernon Window Glass is being used to assure clarity, good vision, and surface brilliance—and to provide them at low cost!



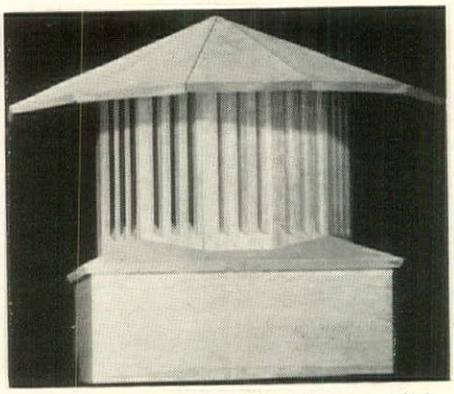
PITTSBURGH PLATE GLASS COMPANY · PITTSBURGH, PA.

"PITTSBURGH" stands for Quality Glass and Paint

Building Reporter

(Continued from page 110)

available for the purpose. A swirling motion is produced within ventilator when wind is caught by the louvers on windward side and exhausted on leeward side, partly by suction. The type of base used makes it possible to adjust ventilator snugly to pitch of the roof. Sizes are: 12, 16 and 21 in. inside dia. The two smaller sizes have inside sleeves which can be raised or lowered easily to regulate flow of air (cut, right).



Information Service: Weyerhaeuser Sales Co., First National Bank Bldg., St. Paul, Minn.

FLUORESCENT LIGHTING. Non-metallic unit utilizes the new critical-material-saving General Electric "Forlamp" ballast.

Name: Super-Maze-Lite.

Purpose: To furnish high-intensity lighting in inspection areas or for high-bay lighting.

Features: Bump-proof ends protect lampholders against abuse and insure correct distance between lamps. Reflector has deep light-cutoff and is formed of Masonite "Reflector-Board." Four-lamp ballast is available for 220- to 280-volt circuits AC. Similar fixture equipped with 2-lamp ballast is also available for 110- to 125-volt circuits AC. Both come in two sizes, for either 4-40 watt or 4-100 watt fluorescent lamps.

Manufacturer: Edwin F. Guth Co., 2615 Washington Blvd., St. Louis, Mo.

FLOODLIGHT. All-glass except the socket housing and bracket.

Name: G-E Silvered-Glass Floodlight (Type L-49).

Purpose: To conserve vital metals.

Features: Reflector is made of high-transmission blown glass with alternate layers of chemically deposited silver, electrolytically deposited silver, high-temperature porcelain enamel, electrolytically deposited copper, and dark green Glyptal enamel. The floodlight is said to be shatter-proof, moisture-proof, heat-resistant, and from 10 to 30% more efficient than all-metal units. Utilizes 300- or 500-watt lamps.

Manufacturer: General Electric Co., 1 River Rd., Schenectady, N. Y.

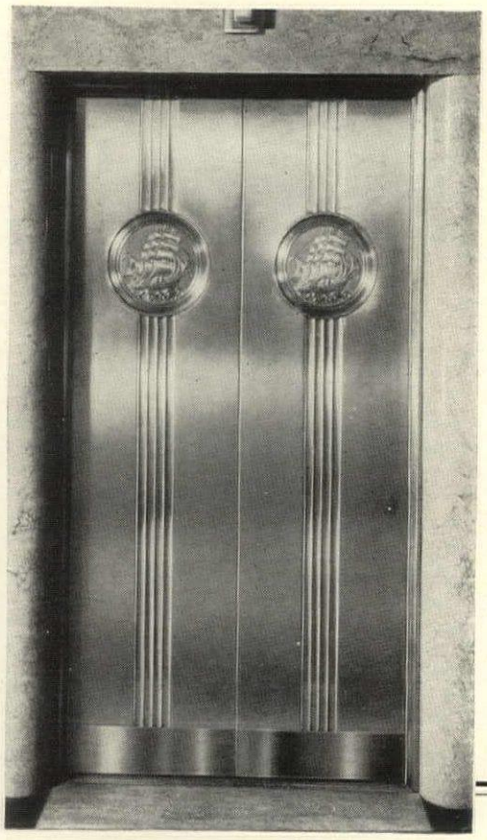
FLUORESCENT MAGNIFIER for close inspection work.

Name: Flud-Lite Magnifier.

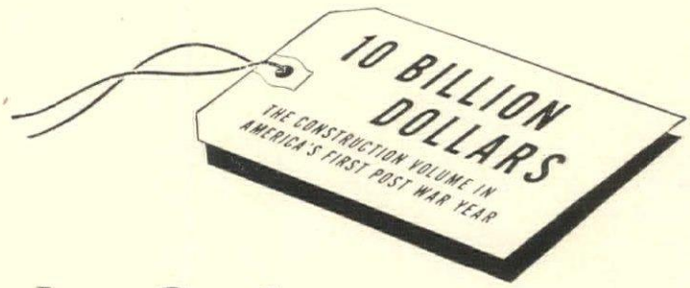
Purpose: To combine magnification and shadow-free lighting in one tool.

Features: Miniature fluorescent lamp, scientifically focused, distributes natural light over object without shadow. It generates

(Continued on page 114)



THE PRICE TAG READS



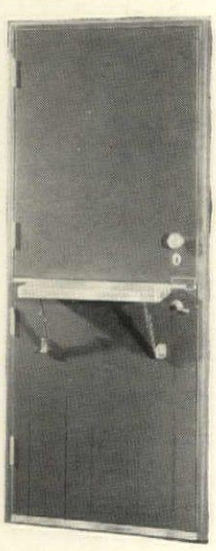
the Sale is ALL YOURS

Ten Billion Dollars represents the consensus of expert opinion on the estimated building volume for our first post-war year. It is about equally divided between residential and commercial-industrial construction. The great majority of the projects represented will be Architect designed and supervised.

That's the job ahead. Comparatively, it dwarfs the best building-boom year of all time. Objectively, it offers architects the opportunity—through fresh thinking, new materials, new means and methods—of vastly improving the living habits, health and happiness of a nation.

That, at least, is the way we think. That is the next goal toward which Dahlstrom is striving, even though now, all our skill and facilities are *at war*. In the meantime, if you believe "two heads are better than one," we will be glad to cooperate with you on your post-war planning. Obviously, no obligation is implied.

DAHLSTROM'S WAR WORK . . . goes on night and day, turning out all manner of things to speed the day of Victory and a peaceful, normal world. Illustrated is one of many examples



(*Top Illustration*). First floor elevator entrances, Bank of America, San Francisco, Calif. Architects, The Capitol Company.

DAHLSTROM

METALLIC DOOR COMPANY, JAMESTOWN, N. Y.

BRANCHES IN NEW YORK, CHICAGO, PHILADELPHIA AND SAN FRANCISCO

Representatives in Principal Cities

Building Reporter

(Continued from page 112)

little heat and is inexpensive to operate. Rotary light switch is mounted in frame. High quality lens, with 5-in. dia., focal length of 13 in., provides full magnified vision. Base and frame swivel joints and friction arm joints permit movement of lens to any desired position without moving base. Frame and arms are die castings, ribbed for strength and rigidity; durable black finish. Available in two models: No. 701 has adjustable base (see illustration), price $24.50. No. 701H is for portable inspection and is equipped with a comfortable grip, hardwood handle, price $22.50. These magnifiers operate only on AC current, 110-120 volts, 60 cycles.

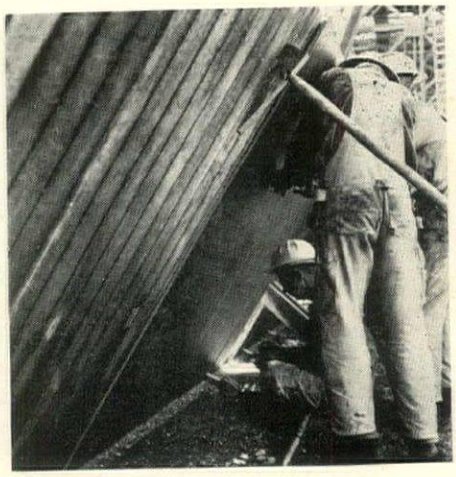
Manufacturer: Electric Tool Div., The Stanley Works, New Britain, Conn.

CONCRETE FORM LINER. Absorptive board for poured wall construction.

Name: Celotex Absorptive Form Liner.

Purpose: To make concrete surfaces harder, denser, smoother and more resistant to abrasion.

Features: Used on the inner surfaces of



concrete forms, it improves the surface of the concrete in several ways. It absorbs air bubbles from the surface, preventing pitting and sand streaks. It removes excess water from the concrete, reducing the water-cement ratio and any excess of fines. It produces a structural change in the concrete to a depth of 1½ in. back from the face of the form. The tough, dense concrete near the surface blends with the interior so gradually that there is no plane of cleavage between the surface concrete and underlying mass. Tests show that pitting directly beneath the surface has been eliminated when the face of the concrete was stoned to remove the surface film, and that there is practically no surface crazing or deterioration. Available in two types: the standard product is ironed on one surface to provide a smooth concrete; a textured liner provides a textured concrete.

Manufacturer: The Celotex Corp., 120 South LaSalle Bldg., Chicago, Ill.

FIRE EXTINGUISHER. New pump tank, uses a minimum of critical materials, correct for use on incendiary bomb fires.

Name: Commander.

Purpose: To meet latest requirement of OCD for a straight stream to control magnesium-type incendiaries.

Features: The oversized air chamber assures minimum pulsation, a steady pressure, a constant stream. Range is 30 to 40 ft. As it is a self-contained unit, it can be readily transported up ladders, over roofs and to points difficult of access. It is equipped with a standard 26-in. hose. Interior has a corrosion-resistant coating and outside finish is red enamel for immediate identification. Available in 2½- and 5-gal. sizes—both approved by the Underwriters'

(Continued on page 116)

Let's look *behind* the store fronts of tomorrow...

TO YOU ARCHITECTS who will plan the stores of post-war America, the door is open for many improvements—both exterior and interior.

What shape your plans may take, we do not know. But we feel sure you will include air conditioning. Because air conditioning makes shopping pleasanter... helps to keep employees on their toes... keeps merchandise fresh... increases sales.

We can't give you specifications on the G-E air conditioning equipment of the future. However, some of the features you can expect are compactness—greater adaptability in application—and lower owning and operating costs. These plus values will come naturally from the contributions G-E engineers have made in applying air conditioning to exacting war-time needs.

When the time comes—whether you want to air condition a department store or a small shop—a hotel or a home—you can turn to G-E with confidence.

Air Conditioning and Commercial Refrigeration Department, Div. 3132, General Electric Company, Bloomfield, New Jersey.

Air Conditioning by

GENERAL ELECTRIC

Building Reporter

(Continued from page 114)

Laboratories with a Class A-1 rating, under the Emergency Alternate Specifications.

Manufacturer: American-LaFrance-Foamite Corp., Elmira, N. Y.

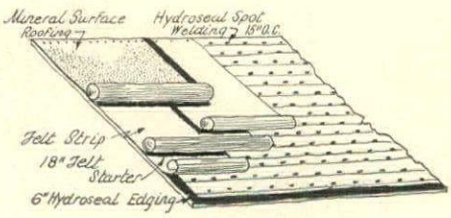
SPOT-WELDING process anchors roofing sheets to roof decks.

Name: Hydroseal.

Purpose: To conserve roofing nails.

Features: Spots of mastic (asbestos-asphalt compound) are placed under corner of each shingle tab. Manufacturer claims that Hydroseal 1) provides greater security against wind, 2) gives better anchorage for roofing sheets, 3) minimizes wrinkles and buckles, 4) eliminates tear hazards caused by nails. For use with asphalt roofing products.

Manufacturer: Paraffine Companies, Inc., 475 Brannan St., San Francisco, Calif.



NEW PRODUCT LITERATURE

ARP. *Keeping the Blackout Outside Your Home,* revised edition. Booklet, 14 pp., 5½ x 8½, prepared to assist householders in blacking out shelter rooms, has been reviewed and passed by the OCD. Gives latest information on how to meet blackout requirements and yet provide pleasant living conditions. Subject matter includes: definitions of civilian defense terms, choosing the shelter room, how to make a blackout shade, new types of ventilators, etc. Numerous drawings and photographs. Price: 2¢ a copy. Westinghouse Electric & Mfg. Co., Bloomfield, N. J.

ELECTRICAL. Two new booklets:
1) *Bulletin 500,* 23 pp., 8½x10½, revised edition. Covers the design and listings of all types of Square D safety switches for industrial applications.
2) *Bulletin 3,000,* 16 pp., 8½x10½, revised edition. Complete information on Square D circuit breaker and fusible switchboards. Square D Co., 6060 Rivard St., Detroit, Mich.

ELECTRICAL INSULATION. *Vinylite Plastics for Wire and Cable Insulation.* Booklet, 12 pp., 8½x11, reviews the advantages of Vinylite synthetic resin compounds for wire and cable insulation from the standpoints of installation, service, safety. Contains tables of physical and electrical properties and examples of typical applications. Halowax Products Div., Union Carbide & Carbon Corp., 30 East 42nd St., New York, N. Y.

ELECTRONICS. *Electronics—a New Science for a New World.* Colorful, pictorial booklet, 32 pp., 8¼x11, tells how the electron is working today: in war combat—in research to reveal more of nature's mysteries—in industry to step up production, increase human efficiency, reduce material waste—in radio and television to extend the range and quality of sound and sight over the air waves—in agriculture to improve quantity and quality—in medicine to reveal more of the structure and behavior of the human body. Striking format by Herbert Bayer. General Electric Co., Schenectady, N. Y.

GLOSSARY. *A Glossary of Housing Terms,* revised edition, BMS91. Reference manual, 34 pp., 8x10½, brings together for convenient use the definitions of approximately 800 generally accepted terms used in building which are not fully defined in most dictionaries. Price: 15¢ a copy. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

GLUE. *The Casco Trouble-Shooter for Joint-Gluing.* Handbook, 21 pp., 4¾ x 7⅝. Simple, basic information on joint-gluing written in brief, nontechnical form for the many new users of wood and glue as substitutes for metal. Subject matter is confined to joint and assembly gluing of wood with casein, urea-resin and phenol-resin glues. Casein Co. of America, 350 Madison Ave., New York, N. Y.

LIGHTING. *Facts to Help You Plan Better Wartime Fluorescent Lighting.* Folder, 8 pp., 8¼x10¾, explains the important place that cold cathode fluorescent illumination is taking in war plants. National Transformer Corp., 224—21st Ave., Paterson, N. J.

LIGHTING. *War Booklet, Serial 2130,* 12 pp., 8x11, covers lighting products for use in industrial plants and offices. Particular emphasis is laid on the new Fluratex nonmetallic reflector units and the silver mirror glass reflector units for high bay installation, which conserve critical materials. Includes data on fluorescent industrial lighting units, on the 3KW industrial unit for Mazda AH-9 lamps, on fluorescent CurtiStrip, and on Fluracite, the baked white synthetic reflecting surface used on Curtis fluorescent lighting equipment. Curtis Lighting, Inc., 6135 West 65th St., Chicago, Ill.

SWITCHGEAR. *Metal-Clad Switchgear, Catalog 1110,* 10 pp., 8½x11, describes and illustrates horizontal drawout metal-clad switchgear in 100,000, 150,000 and 250,000 KVA capacities at 5,000 and 15,000 volts. Roller-Smith Co., Bethlehem, Pa.

WROUGHT IRON. *Wrought Iron for Underground Services.* Technical bulletin, 36 pp., 8½x11, discusses the most important factors effecting soil corrosion of underground piping, weighs theory against test results and outlines installation histories of water wells and lines, lawn sprinkler piping, oil and gas wells and lines, gasoline lines and tanks, and electrical cable conduit. Includes many photographs of underground piping installations under varied conditions in major cities throughout all parts of the country. Well organized, easy to read. A. M. Byers Co., Clark Bldg., Pittsburgh, Pa.

A BOOKFUL OF NEW, WORKABLE IDEAS FOR POST-WAR HOMES

THE end of this war may introduce one of the biggest home-building booms the nation has ever known.

Architects must be ready—a year or more ahead of time. That's why we are bringing out this *New Idea* book now. It features 85 *practical* ways to make homes better with steel.

This is *not* a visionary book, featuring imaginary uses of steel, but one which gives useable information about new steel products which will be obtainable after the war. Many of these products will bring lower building costs because they take advantage of mass production methods.

If we are to develop low-cost, high-quality housing, it will be necessary for architects, builders and suppliers to co-operate in every way possible. In this new book, we have urged prospective home owners to use the services of reliable architects and builders for best building results. Send the coupon today and we'll put you on the list for a copy.

Reserve your copy today!

United States Steel Corporation Subsidiaries
621 Carnegie Building, Pittsburgh, Pa.

Gentlemen:

Please send me a copy of your forthcoming book, "85 Ways to make a Better Home."

Name.....

Firm.....

Address.....

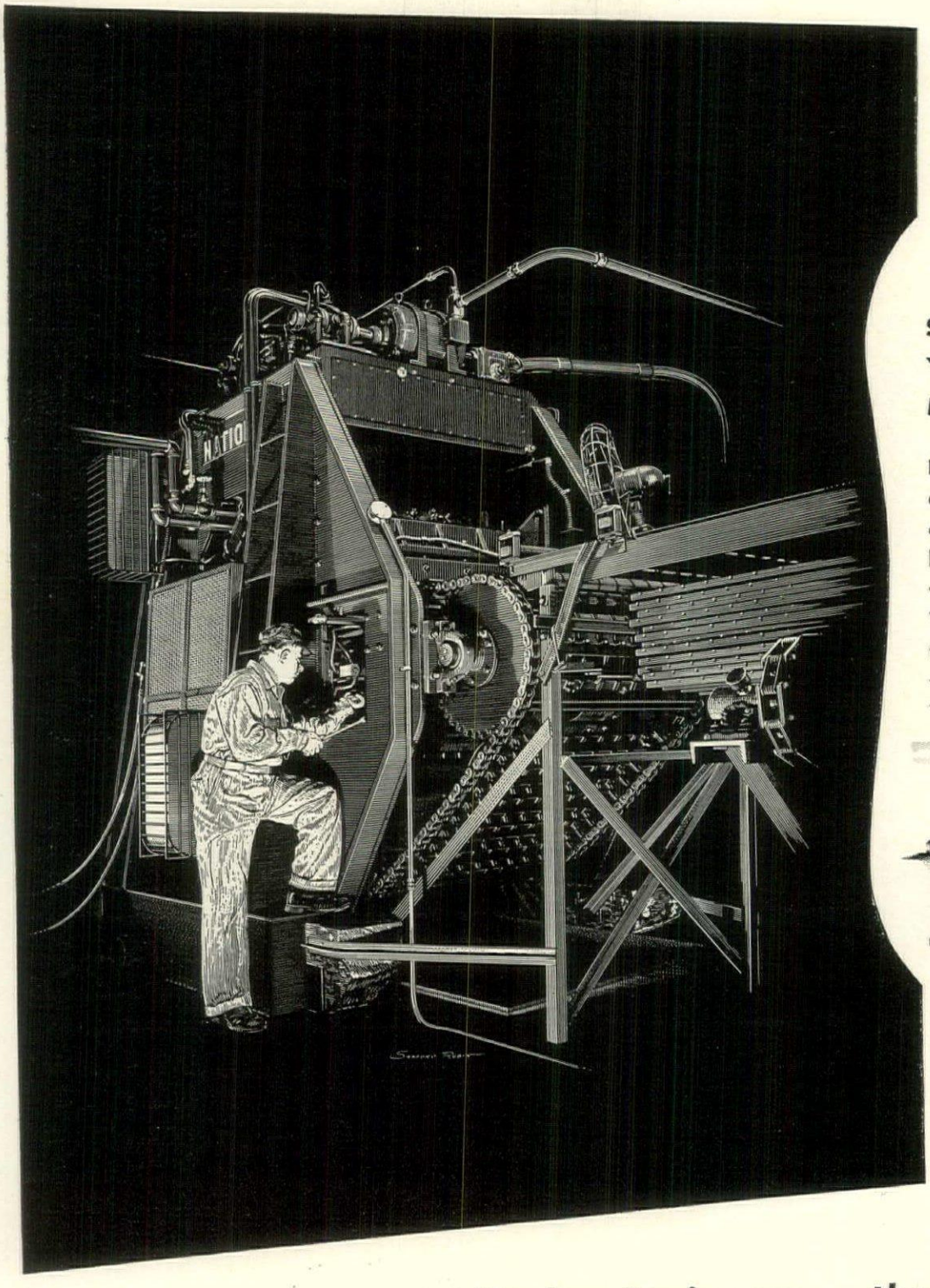
City..... State..... AF 2-43

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*

United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

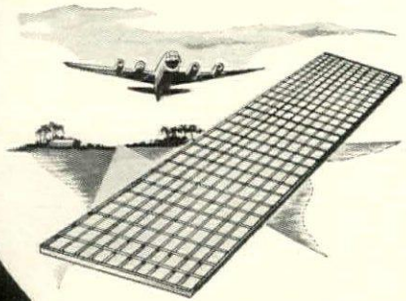
UNITED STATES STEEL

EVERYTHING WE ARE DOING TODAY...



Some Facts We'd Like You To Know About Mesker Brothers

Ever see a "hydraulically-operated 40-gun automatic electric welder"? You're looking at one . . . that *spits* welds as fast as you can say: "Zit, zit"! 24 hours a day, it's on the job, welding a war product very much *like* a window. Tomorrow? You guessed it.



Mesker Engineers . . . the country over . . .

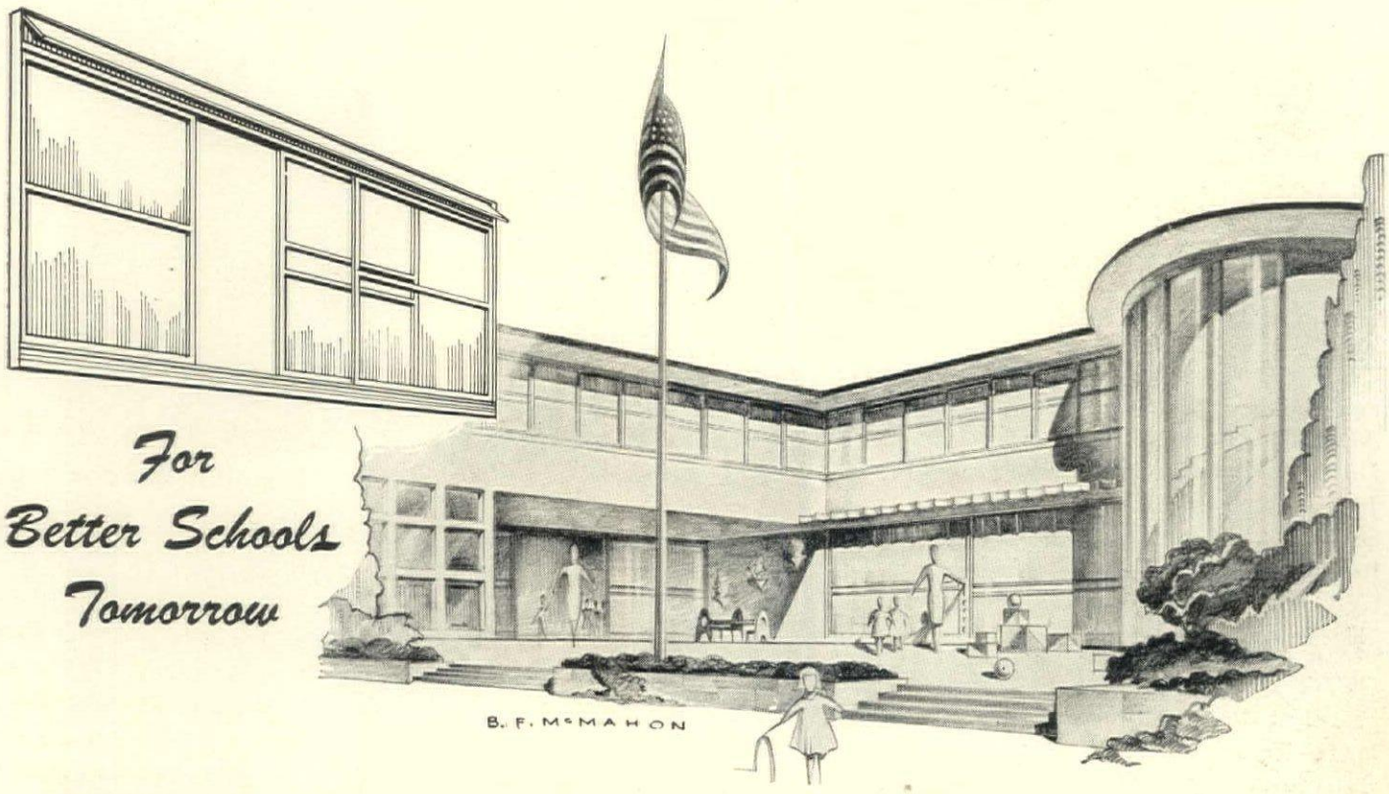
YESTERDAY AND TOMORROW

CASEMENT WINDOWS • MONUMENTAL WINDOWS • INDUSTRIAL • WINDOWS • SCREENS • INDUSTRIAL DOORS • DETENTION WINDOWS • REINFORCING MESH GRATING . . . plus . . . tomorrow . . . some other interesting new products!

Mesker

424 SOUTH SEVENTH STREET

IS DESIGNED TO HELP YOU TOMORROW



For Better Schools Tomorrow

Mesker Metal Windows

Out of the vast proving ground of war-time experience is emerging much new Mesker "know-how"... born of much problem solving and new production experience. For example, we're making pre-fabricated airplane runways for war-time use... and learning a lot applicable to making peace-time windows more efficiently, more economically. Mesker designers are hard at work translating this invaluable production experience into windows you'll proudly specify tomorrow. After the war, there'll be Mesker Metal Windows... new in design, appearance, operation, simpler to install... for the modest home, the hard-at-work factory, the imposing sky-scraper, Tomorrow's Schools. *In* the future, keep your eye on "the Window WITH a Future"... MESKER.

Do You Have Your "Red Book of Steel Sash?"

If not, write for this comprehensive volume, personalized with your name. Covers metal windows from A to Z... ideal to have at your elbow when working up specifications, details, etc., on post-war projects. No obligation.

Consult Your Mesker Engineer Now!

His job is to help you with your war-time construction problems... involving windows or whistles or whirligigs ... to asist on post-war projects requiring the kind of windows only Mesker can produce. Consult him NOW.

In War and Peace... at your service!

Brothers

ST. LOUIS, MISSOURI, U. S. A.

TODAY

STEEL AMMUNITION CASES · PRE-FABRICATED STEEL AIRPLANE RUNWAYS · OIL AND WATER STORAGE TANKS FOR MINE SWEEPERS AND SUB-CHASERS... other products which necessarily must remain military secrets.

JOINTS

Window, Stone and other Exterior Vertical Joints

MINWAX CAULKING COMPOUNDS

These compounds offer: PERFECT PLASTICITY—non hardening, stable and permanent; PERFECT ADHESION—the oils harden firmly *into* the surface; DRY "EGGSHELL" SKIN—a protective surface seal. In addition they are NON-SHRINKING—do not "pull away" to cause leakage — and NON-STAINING — the oils can not "bleed into the stone."

PROOF

GET THE FACTS. Send for copy of unbiased report made by Pittsburgh Testing Laboratory—a liberal education in caulking practice.

WEATHERCAP

—a formed strip of pure, soft lead imbedded in MINWAX Caulking Compound creates a permanent waterproof seal for horizontal or sloping joints in masonry, such as copings, cornices, water-tables, balustrades, steps, etc.

Horizontal or Sloping Joints under Traffic or Liquids

MINWAX EXPANSION JOINT CEMENT

A black, solid, elastic, asphalt compound, which is a blend of special Minwax Asphalts and colloidal mineral fillers. Heated and poured into a joint, it will form an elastic, water-tight bond to masonry, steel, or glass.

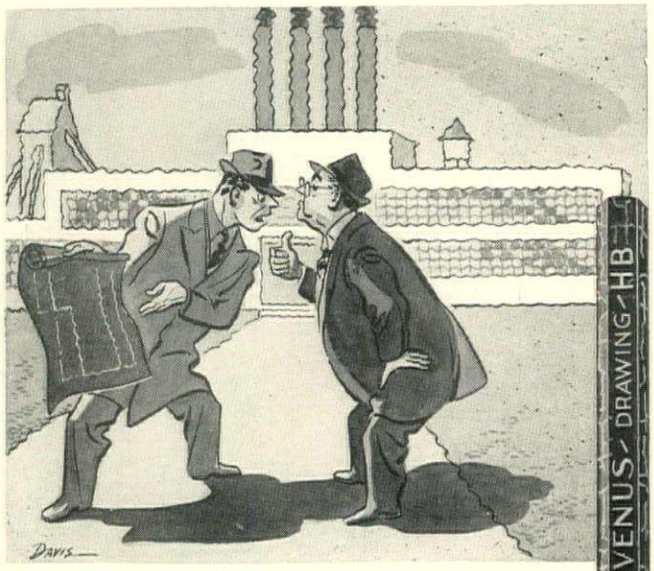
Triboro Bridge, New York
MINWAX Expansion Joint Cement used

MINWAX CO. INC., 11 WEST 42ND STREET, NEW YORK

TRADE **MINWAX** MARK

Waterproofings • Dampproofings • Caulkings
Wood Finishes • Waxes • Protective Coatings
COMPLETE CATALOGUES IN SWEET'S

A COMPLETE WATERPROOFING SERVICE



"THE PLANS WERE DRAFTED IN AN UNHEATED OFFICE"

Unheated or heated — more drafting rooms in America use Venus Drawing Pencils than any other make.

Draftsmen know they can rely on the strength and smoothness of Venus Drawing. And they know that each degree of hardness is exact and unvarying, whenever or wherever they buy it.

But let Venus Drawing Pencils speak for themselves. Just mail us the coupon below—circling the two degrees you would like to try—and we will send you free samples.

VENUS *Drawing* PENCILS

AMERICAN PENCIL CO. NEW YORK - VENUS - DRAWING - HB

American Pencil Company
Dept. 110, 500 Willow Ave., Hoboken, N. J.
In Canada: Venus Pencil Company, Ltd., Toronto

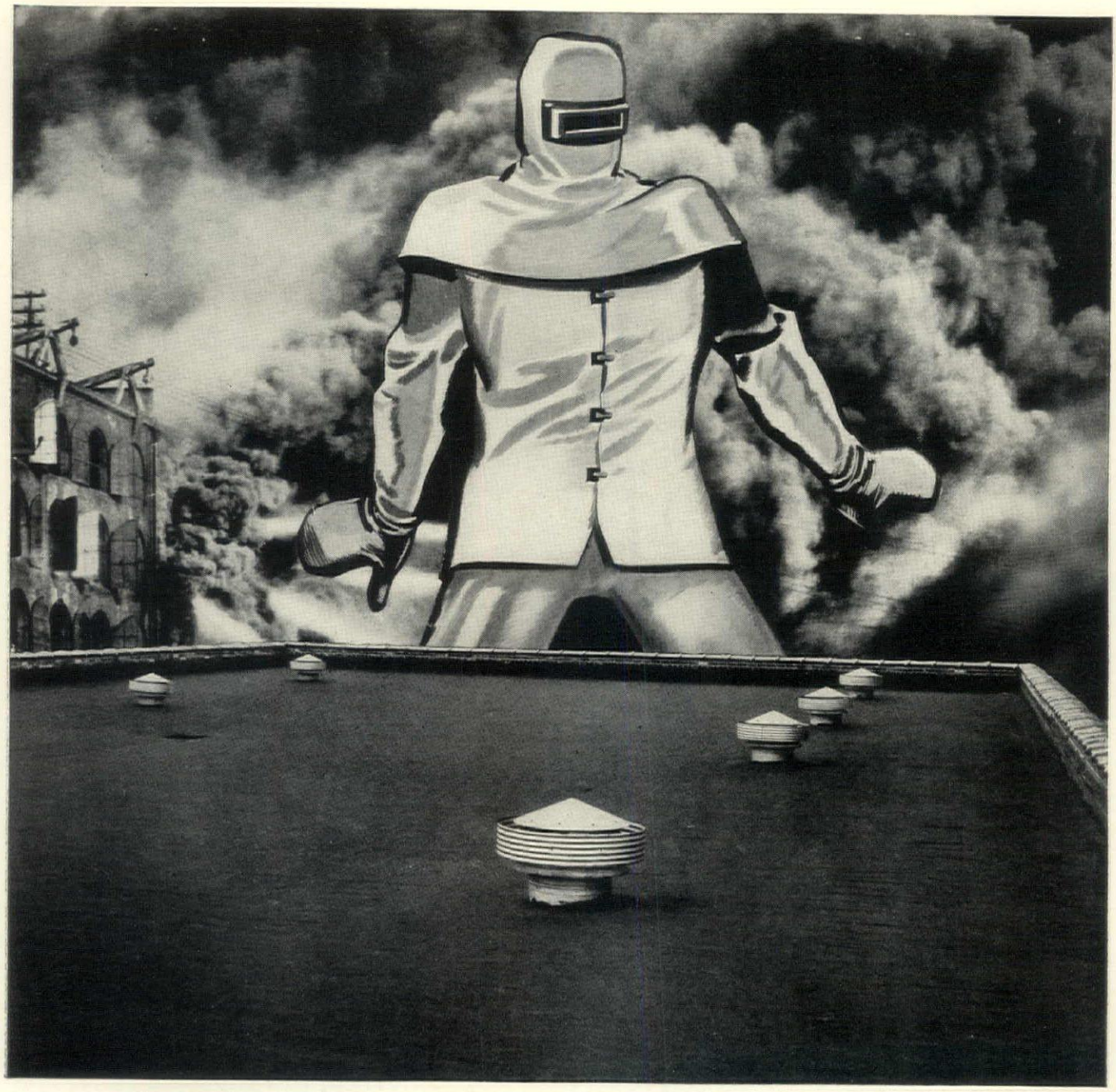
Please send FREE samples of the two grades circled:
9H - 8H - 7H - 6H - 5H - 4H - 3H - 2H - H - F - HB - B - 2B - 3B - 4B - 5B - 6B

NAME and title _____

FIRM NAME _____

ADDRESS _____

CITY _____ STATE _____



ASBESTOS *stands guard day and night against* ROOF-COMMUNICATED FIRE!

J-M Asbestos Built-Up Roofs provide fire protection and permanence...at low cost!

DON'T LET FIRE interfere with war production! Safeguard industrial plants against roof-communicated fire with a Johns-Manville smooth surfaced Asbestos Built-Up Roof. It provides such complete protection that even flaming embers falling on it from a nearby fire burn out harmlessly.

J-M Asbestos Roofs also provide durability. Long exposure to sun, rain and weather has little effect on the asbestos felts used in their construction. They are rotproof, need no periodic coating, and require little if any maintenance.

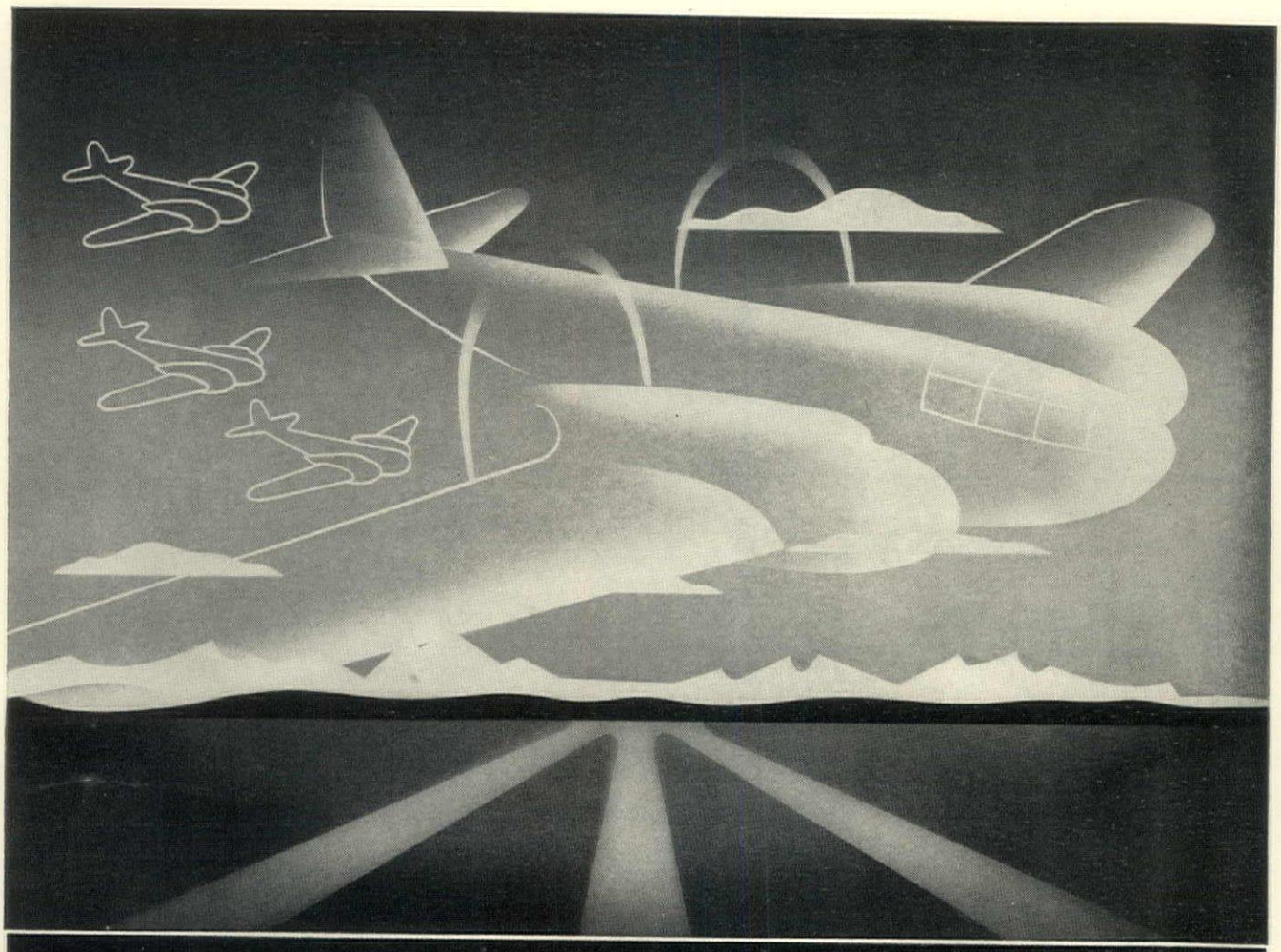
For complete details, send for your copy of the 48-page illustrated book, "Things You Should Know About Your Roof." Johns-Manville, 22 East 40th Street, New York, N. Y.

JM PRODUCTS

Johns-Manville

Asbestos

Built-Up Roofs



Preview of a busy airport

How would you get the hangars and buildings up quickly for Uncle Sam? How save time in wartime . . . especially in the middle of winter?

THIS airport-in-the-making will be an important link in the nation's chain of military fields. But how to get the finished structures off the blueprints quickly? The weather is cold for concreting. Time is short.

Here's a natural for Atlas High-Early cement. It's the type of wartime job that this product has been speeding for industry, war housing, military roads, naval bases, and army camps.

And in using this cement to speed foundations, structural supports, floors, walls and ramps, and finish the last runway for this airport, consider the other advantages in addition to time-saving which Atlas High-Early often makes possible—savings in lumber and fuel—savings in labor, in release of equipment such as tarpaulins and salamanders more quickly for new work, in earlier use of concrete, and earlier occupancy by owner.

If your essential job is a "Rush" (and what wartime job isn't?), then look to Atlas High-Early cement to give you serviceable, durable concrete several times faster than standard portland cement. Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York.

CHECK ON ATLAS HIGH-EARLY
for Wartime Construction

Atlas High-Early cement gains strength rapidly —produces serviceable concrete in one-fifth the usual time on some jobs.

So it—

1. ***Permits earlier use*** of concrete, and thus gives owner earlier occupancy.
2. ***Saves manpower*** when such conservation is needed most—releases men for new jobs more quickly.
3. ***Conserves lumber.*** Forms may be stripped sooner—often in 24 hours instead of from 3 to 5 days—and re-used. Hence fewer sets of forms may be needed, saving time, labor, and lumber.
4. ***Shortens time required for protection and curing*** as much as 70%. This saves fuel and releases tarpaulins and salamanders for other work.
5. ***Reduces overhead*** by saving time, manpower and equipment.

AF-H-51

OFFICES: *New York, Chicago, Albany, Boston, Philadelpia, Pittsburgh, Minneapolis, Duluth, Cleveland, St. Louis, Kansas City, Des Moines, Birmingham, Waco.*

SAVE TIME IN WARTIME WITH

Atlas High-Early Cement

A UNIVERSAL ATLAS PRODUCT

New Target for Industry:

More Dollars Per Man Per Month in the PAY-ROLL WAR SAVINGS PLAN

TO WIN THIS WAR, more and more billions are needed and needed fast—AT LEAST A BILLION DOLLARS A MONTH IN WAR BOND SALES ALONE!

This means a *minimum* of 10 percent of the gross pay roll invested in War Bonds in every plant, office, firm, and factory in the land.

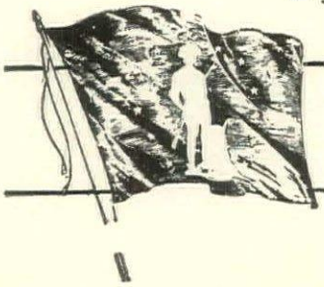
Best and quickest way to raise this money—and at the same time to "brake" inflation—is by stepping up the Pay-Roll War Savings Plan, having every company offer every worker the chance to buy MORE BONDS.

Truly, in this War of Survival, VICTORY BEGINS AT THE PAY WINDOW.

If your firm has already installed the Pay-Roll War Savings Plan, *now is the time*—

1. To secure wider employee participation.
2. *To encourage employees to increase the amount of their allotments for Bonds, to an average of at least 10 percent of earnings—because "token" payments will not win this war any more than "token" resistance will keep the enemy from our shores, our homes.*

If your firm has not already installed the Pay-Roll War Savings Plan, *now is the time to do so.* For full details, plus samples of result-getting literature and promotional helps, write, wire, or phone: War Savings Staff, Section E, Treasury Department, 709 Twelfth Street NW., Washington, D. C.



U. S. War Savings Bonds

This space is a contribution to America's all-out war program by

THE ARCHITECTURAL FORUM

EXCUSE IT, PLEASE, BUT THE TROOPS MUST HAVE SKIS!

Of course we are mighty sorry that we haven't been able to keep our furniture deliveries rolling along on schedule. But, on the other hand, we are proud that we are able to contribute to the war effort by making laminated skis and other restricted laminated products for the Armed Forces.

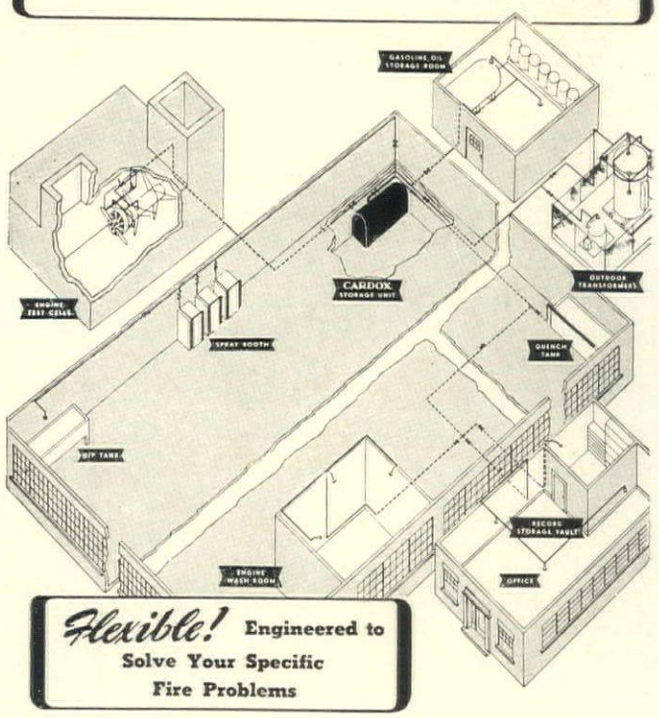
So next time your order is a little overdue, won't you just say to yourself: "Artek is making another shipment to Uncle Sam."

ARTEK-PASCOE INC.

16 EAST 49th STREET, NEW YORK

A SINGLE SYSTEM

Protecting *One* or *Many* Fire Hazards



Flexible! **Engineered to Solve Your Specific Fire Problems**

You, as an architect for war industry, know that war production must face the damaging setbacks that can be caused by fire. But the wide variety of hazards, existing in virtually every plant and shop, presents a difficult problem. Adequate fire protection must be provided *for each*. Differences in hazards, floor space, layout and size call for a fire extinguishing system engineered for over-all plant requirements.

Cardox Systems meet the specification fully. The schematic view shown includes a combination of fire problems so diversified as to be met with infrequently in industry. Yet one Cardox System, with its single storage unit, can be engineered to the job. It provides today's sound method of swift extinguishment, with little or no loss, damage or delay to equipment or production.

The flexibility of Cardox Systems permits easy installation in new construction or existing buildings. Write on your business letterhead for Bulletin 623.

CARDOX CORPORATION

BELL BUILDING, CHICAGO, ILLINOIS

District Offices in: New York • Detroit • Pittsburgh • Cleveland
Washington • Atlanta • San Francisco • Los Angeles • Seattle

CARDOX

NON-DAMAGING FIRE EXTINGUISHING SYSTEMS

SPECIFICATION AND BUYING INDEX

The advertising pages of **THE ARCHITECTURAL FORUM** *are the recognized market place for architects and all others engaged in building. A house or any other building could be built completely of products advertised in* **THE FORUM.** *While it is not possible to certify building products, it is possible to open these pages only to those manufacturers whose reputation merits confidence. This* **THE FORUM** *does.*

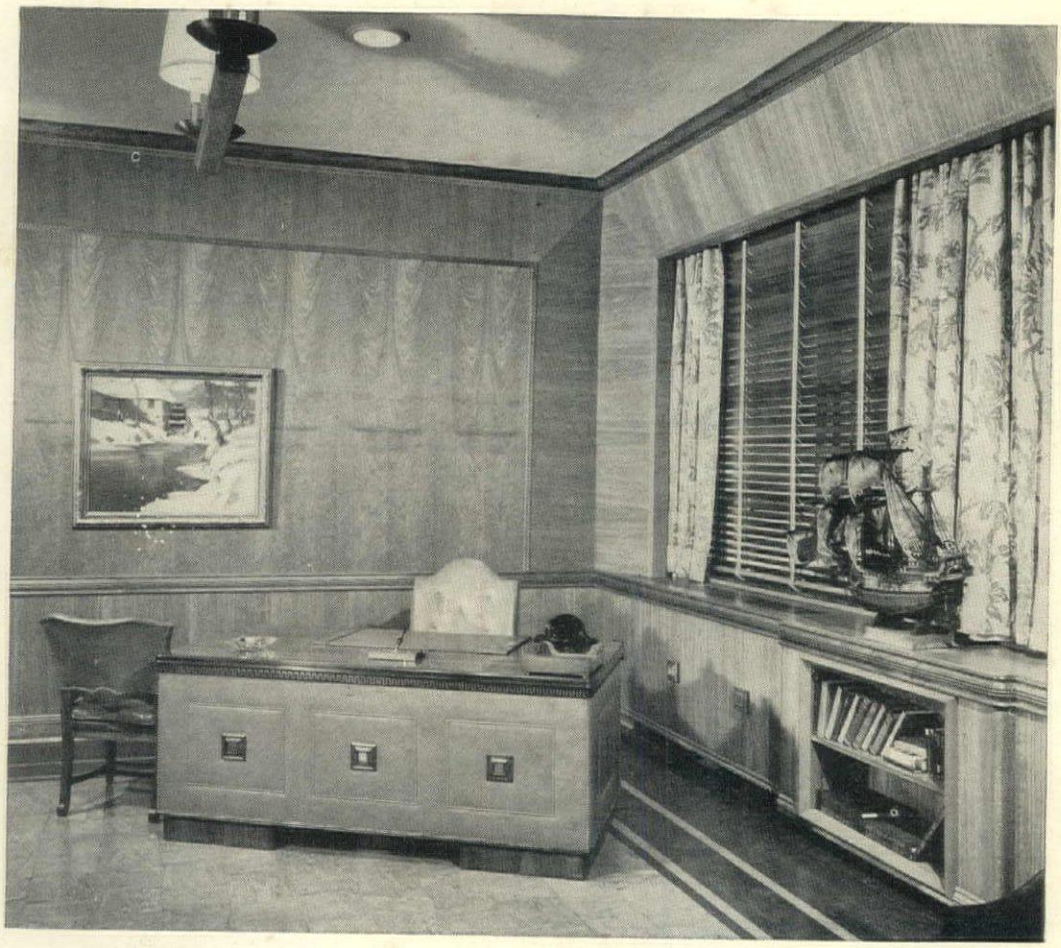


PHOTO: HEDRICH

The Matchless Charm of Beautiful Woods

TAILORED TO YOUR CLIENT'S PERSONALITY

Designing backgrounds for clients of diverse tastes is tremendously simplified when you use Flexwood.

This versatile medium makes possible the crisp severity of functional styling . . . the elegance of 18th Century paneling . . . the sleek curves and pale tones of the ultra-modern.

A handsome example of Flexwood in use is shown in the office above, one of many designed by Raymond Loewy for the Abbott Laboratories, Administration Building, North Chicago Plant, Chicago.

The room illustrated employs the age-old beauty of wood in an unusual combination. The central panel of Figured Teak is framed by a splayed section of English Oak. The dado also is finished in English Oak.

Made of selected veneers backed with fabric, and flexed by a patented process, wood in this new form is so pliable that it can be wrapped around a pencil! Because Flexwood is a non-strategic material and may be applied over existing surfaces with no structural changes involved, it is ideal for meeting present day remodeling needs.

flexwood

Genuine wood made pliable

Flexwood is immediately available, economical to use, easy to handle and install. There are more than 40 woods from which to choose!

Write today for the Flexwood folder and samples of some of the fine woods. No obligation. Address:

UNITED STATES PLYWOOD CORP.
103 Park Avenue, New York, N. Y.

★ ★ ★

FLEXGLASS—the Glass that Bends. Genuine glass rectangles mounted on flexible fabric backing. Readily cemented to flat or curved surfaces. Mirrors, dewdrops and opals . . . in many different colors.

Flexwood and Flexglass are manufactured and marketed jointly by The Mengel Company, Louisville, Ky., and United States Plywood Corporation.

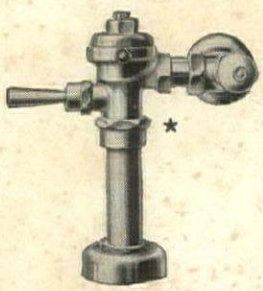
JOIN YOUR LOCAL
CIVILIAN DEFENSE UNIT

★ *Illustration shows magnified cut-away section of No. 50 Vacuum Breaker (See Below). Note: No mechanical moving parts to stick or freeze. Easy to install. No change in present roughing required.*

DEFENSE OF CIVILIAN HEALTH

The first line of defense is maintenance of civilian health. We have competent Air Raid Wardens, Fire Wardens, Airplane Spotters, Nurses Aids, First Aid, and Auxiliary Police who give freely of their time to aid and protect the civilian population and their homes.

You can help maintain and protect civilian health. Your industry recognizes the possibility of water contamination and its resultant detrimental effects on the health and morale of our civilian population. After years of careful survey, the Federal Government specifies that every toilet fixture with a jet, be equipped with an approved Backflow Preventer. Therefore, every home, factory, public building should have this same protection. Without home support, our troops cannot win. Bring this thought to your community and specify and install the No. 50 Delany Vacuum Breaker—it's 20 years ahead of any flush valve vacuum breaker on the market.

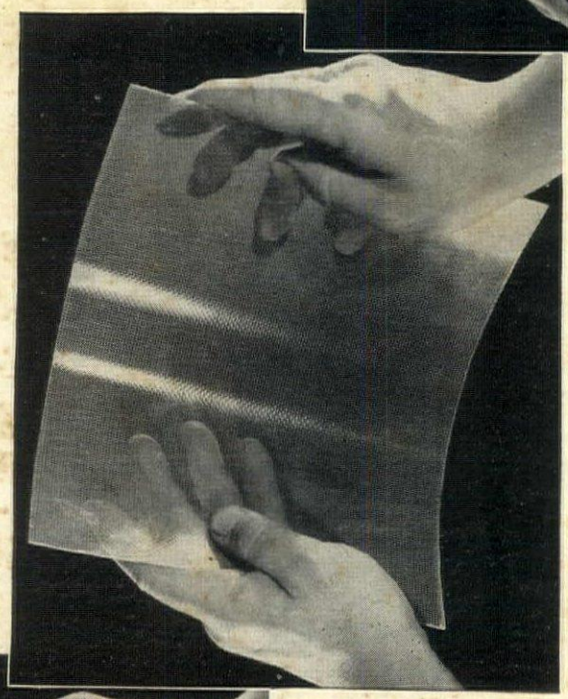


Showing No. 50 DELANY VACUUM BREAKER *installed in Delany Flush Valve*

SINCE 1879
Coyne & Delany Co.
BROOKLYN N.Y.

THE 3 TYPES OF PLASTIC GLAZING

War has brought into world-wide use the three types of Plastic Glazing developed by Celanese Celluloid Corporation. VIMLITE and LUMAPANE, with wire base, meet severest conditions of exposure to explosion . . . provide glazing for pre-fabricated hangars, troop housements, war industries plants, etc., etc. LUMARITH provides a crystal-clear non-shattering closure . . . has outstanding impact strength . . . is widely used in glider and 'plane cockpit enclosures, windshields, gun turret housings, etc., etc. Plastic Glazing is easily installed in both wood and steel sash. Its many wartime applications today presage far greater use in tomorrow's peacetime world. Write for descriptive booklet on all three types.



VIMLITE

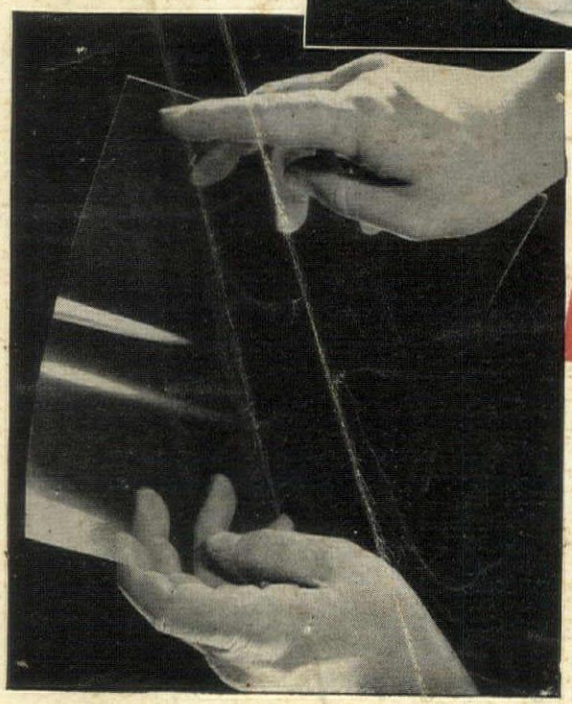
Made in 24″, 28″ and 36″ widths, in rolls 100′, 50′ and 25′. Wire base—14 mesh. May be cut with shears.

LUMARITH

Made in sheets 20″ x 50″. Simple curves can be formed without heat.

LUMAPANE

Made in sheets 20″ x 50″ from which panes may be cut. Standard wire base is 14 mesh.



CELANESE CELLULOID CORPORATION

The First Name in Plastics

Celanese Celluloid Corporation, a division of Celanese Corporation of America, 180 Madison Ave., New York City. *Representatives: Dayton, Cleveland, Chicago, St. Louis, Detroit, San Francisco, Los Angeles, Washington, D. C., Leominster, Montreal, Toronto, Ottawa.*

A DIVISION OF
CELANESE CORPORATION OF AMERICA

VIMLITE
LUMAPANE
LUMARITH
Trade Marks Reg.
U. S. Pat. Off.

For "HOMES on PAPER"

TED KAUFFER

The perfect door for post-war planning is The "OVERHEAD DOOR" with the Miracle Wedge, built in any size to fit any opening. Figure the size now, choose the style later. When homes are built again, this quality door will be available for residential use, with streamlined Salt Spray Steel hardware for quiet, easy operation. The "OVERHEAD DOOR" is built for a lifetime of service and sold installed by a Nation-Wide Sales-Installation-Service.

The "OVERHEAD DOOR"
TRADE MARK
WITH THE
MIRACLE WEDGE

OVERHEAD DOOR CORPORATION
Hartford City, Indiana, U. S. A.