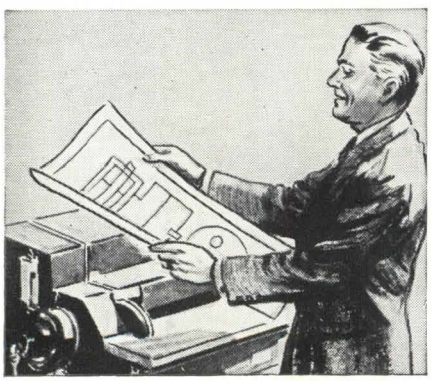
THE GENERAL MANAGER ASKED:

"Why change to Ozalid Whiteprints?"

YOU CAN COUNT ON the General Manager firing a line of questions when radical changes are suggested.

Here are three questions frequently asked by hard-thinking, hard-boiled executives when the engineering department requisitions an Ozalid Whiteprint Machine. And here are some sound reasons why so many have been convinced of Ozalid's superiority over old-fashioned print-making methods.



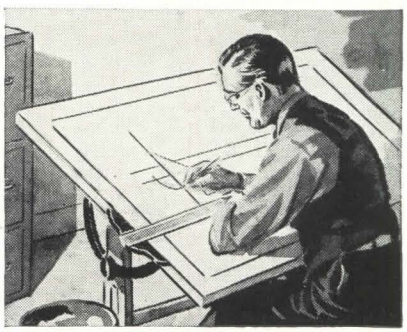
Q. ***What's wrong with our present equipment?***

A. Compare with Ozalid's. An Ozalid machine turns out whiteprints of engineering drawings, charts, letters in two fast steps—EXPOSURE and DRY DEVELOPMENT. There are no liquid baths, no plumbing connections, no solutions to mix. A score of other maintenance headaches have also been eliminated.

And, an Ozalid Whiteprint Machine is so clean and compact . . . it may be installed right in the drafting room. Anyone can operate it at top efficiency.

Q. ***Why is the Ozalid Process the most versatile?***

A. You can do so much more! (a) You can make prints having black, blue, or maroon lines on a white background. The maroon line is recommended for the shop since it shows the greatest contrast to grease and dirt . . . and will stand up better than the white line of a blueprint. (b) You make duplicate originals the same way you produce standard prints —without Van Dyke tieups. (c) You can use cut sheets as well as roll stock in an Ozalid machine. Thus, you can completely eliminate trimming waste by using sheets the size of your tracings.



Q. ***How can Ozalid save a thousand hours in our drafting room?***

A. Give a draftsman an Ozalid duplicate of a tracing which you want changed in part. He'll have a "new" original in a fraction of the time required with other methods. First, he eradicates the obsolete lines with Ozalid Corrector Fluid. Then he draws in the new design. It's that easy! It's *never* necessary to redraw any line which remains the same as in the original.

Think of the changes you're making in your products today. Think of the changes you'll be making in the post-war period. By installing an Ozalid Whiteprint Machine—you'll be sure of a "head start."

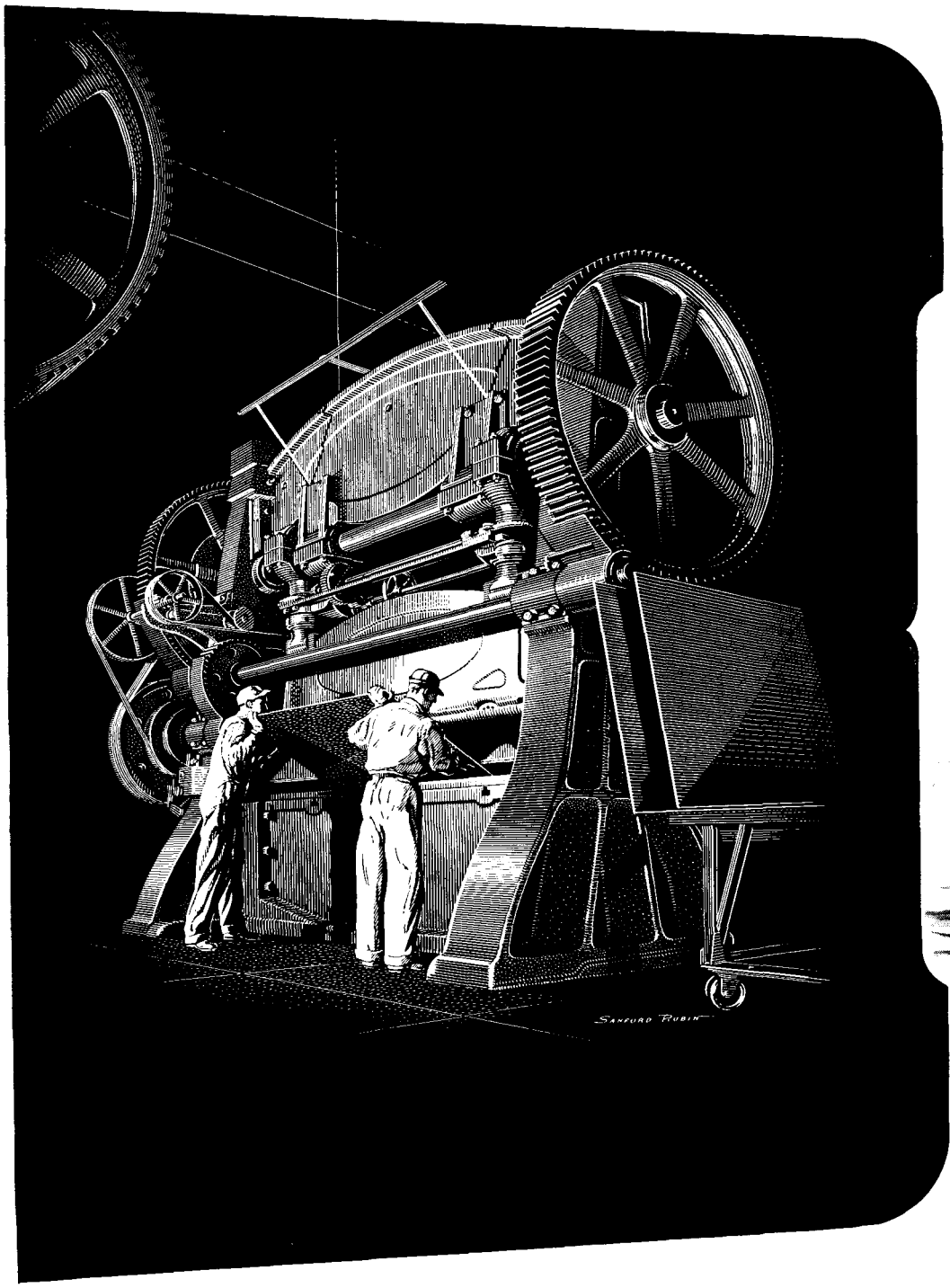
OZALID PRODUCTS DIVISION

GENERAL ANILINE AND FILM CORP.

Johnson City, N. Y.

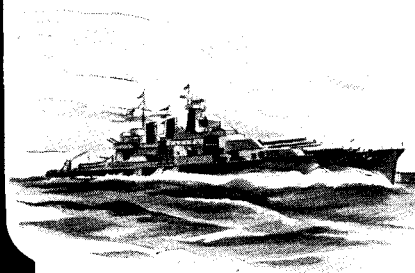
Write for "Simplified Printmaking." *It shows how leading manufacturers save time, labor, and materials with the Ozalid Process.*

EVERYTHING WE ARE DOING TODAY..



Some Facts We'd Like You To Know About Mesker's New Facilities

200-Ton Presses, like our "Big Bertha", can be found in more than one plant. Not so common are its many new uses that Mesker men are daily devising, to expedite war production today . . . contribute to better windows tomorrow.



Mesker Engineers . . . the country over . . .

YESTERDAY AND TOMORROW

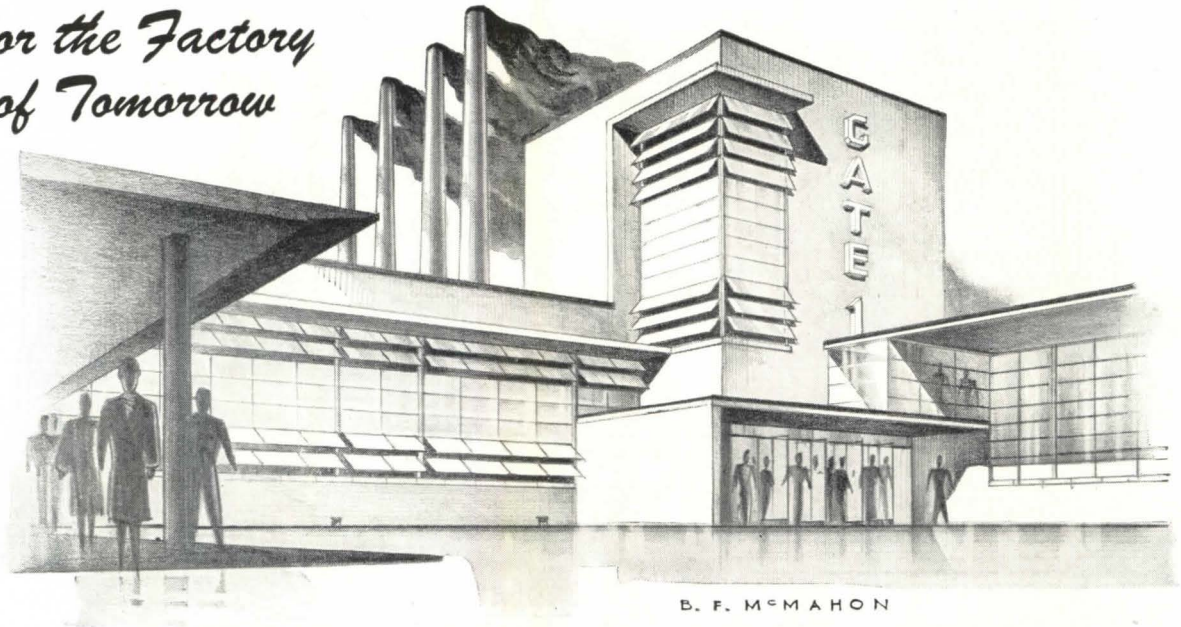
CASEMENT WINDOWS · MONUMENTAL WINDOWS · INDUSTRIAL WINDOWS · SCREENS · INDUSTRIAL DOORS · DETENTION WINDOWS · REINFORCING MESH GRATING . . . plus . . . tomorrow . . . some other interesting new products!

Mesker

424 SOUTH SEVENTH STREET

S DESIGNED TO HELP YOU TOMORROW

For the Factory of Tomorrow



B. F. McMAHON

MESKER METAL WINDOWS

Ever hear of a draft-less, yet 100% *low-cost* ventilated, perfectly natural-lighted factory? Industrial designers have been working toward it for years. For, after all, *windows ARE cheaper than walls.* Properly distributed by the designer in long horizontal runs, they provide abundant natural light and low-cost ventilation; properly weather-conditioned, they assure excellent insulation. Architect McMahon's Factory, planned for Tomorrow, will *be* such a factory. The windows that will make it possible will be a direct outgrowth of the facilities, techniques and processes now being developed in a plant all-out on war production. The "Window *Of* The Future" is today's window WITH a future . . . *Mesker Metal Windows.* They'll be worth waiting for.

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 whisties or whirligigs . . . to assist 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 THE NAVY'S FIGHTING SHIPS . . . other products which necessarily must remain military secrets.

Today EXPERIENCE— not theory—answers RADIANT HEATING QUESTIONS

BYERS WROUGHT IRON

Probably there always will be design problems to discuss in connection with Radiant Heating . . . progress to be reported . . . experiences to be shared.

But one subject of conversation that once occupied many architects and engineers—"is Radiant Heating a good system?" . . . has been settled by a multitude of answers to these matter-of-fact queries:

. . . Do the people who live or work in Radiant Heated structures *like* it?

. . . Do the people who pay the heating bills, whether occupants or owners, think costs are reasonable?

Once experience answers these questions, all theorizing falls rather flat. And experience has: the following report is representative.

One day in February when the temperature (after an overnight 10 below) was 4° below zero, a group of engineers went out to spot-check two installations.

In the first—a Library—the group reaction was that the temperature was a little high. The thermometer read 74°, when 70° would have been ample. Charts from recording thermometers show the following readings at 4:00, 6:30 and 11:00 A.M., respectively. Floors, 85°, 87°, 87°; 4½-feet above floor, 72°, 73°, 74°; ceiling, 72°, 73°, 74°. Floor covering was linoleum. Gas bills covering an estimated 75% of the heating load for the entire winter were $64.83.

In the second—a Tavern—recording thermometers were not yet installed, but here again the group reaction was that temperatures were unnecessarily high. Although plaster had been applied directly to uninsulated cinder-block side walls and brick front wall, and although there was heavy air infiltration at top and middle of the double doors, gas bills for an estimated ¾th of the heating season, (including the coldest December in 8 years), were only $66.58. In both installations, the occupants had nothing but good to report of comfort conditions.

In material selection also, experience has eliminated any need for uncertainty or theorizing. Byers Genuine Wrought Iron has served for years in Radiant Heating installations, as well as in other applications where corrosive conditions were identical. Its unique and superior serviceability is a matter of engineering record.

Our technical bulletin, "Byers Wrought Iron for Radiant Heating Installations," digests the what-where-how of the subject into handy, usable form. May we send you a complimentary copy?

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

Corrosion costs you more than Wrought Iron

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE ALLOY STEELS · OPEN HEARTH ALLOY STEELS
CARBON STEEL TUBULAR PRODUCTS

ARCHITECTURAL
RECORD
COMBINED WITH AMERICAN ARCHITECT AND ARCHITECTURE

VOL. 93 **APRIL 1943** No. 4

CONTENTS

NEXT MONTH

HOSPITALS are essential buildings in times of both war and peace. Hospitals have been built in record time to care for the war casualties we must expect. New hospitals are under construction throughout the land, some temporary, others permanent. Existing hospitals have been enlarged and thoroughly modernized. New communities of industrial workers have meant new hospitals in war production areas, and hospitals of all kinds are now being planned for postwar construction. It is fitting that our Building Types Study for May should be devoted to buildings so essential to the health of the country. . . . Good lighting for all types of buildings and for all sorts of seeing tasks is much more than a matter of mere "foot-candles." Matthew Luckiesh, D.Sc., D.E., has written a thoroughly practical article for architects and engineers on providing proper conditions for seeing. He explains the application of the latest research to our everyday problems. . . . Construction below grade has always been hampered by troublesome water conditions. Research into the causes of the trouble and the ways of correcting it by proper draining and waterproofing methods is explained in a comprehensive article. . . . And these are but three of the not-to-be-missed features in the May issue.

F. W. DODGE CORPORATION
H. JUDD PAYNE, Vice President in charge of MAGAZINE DIVISION

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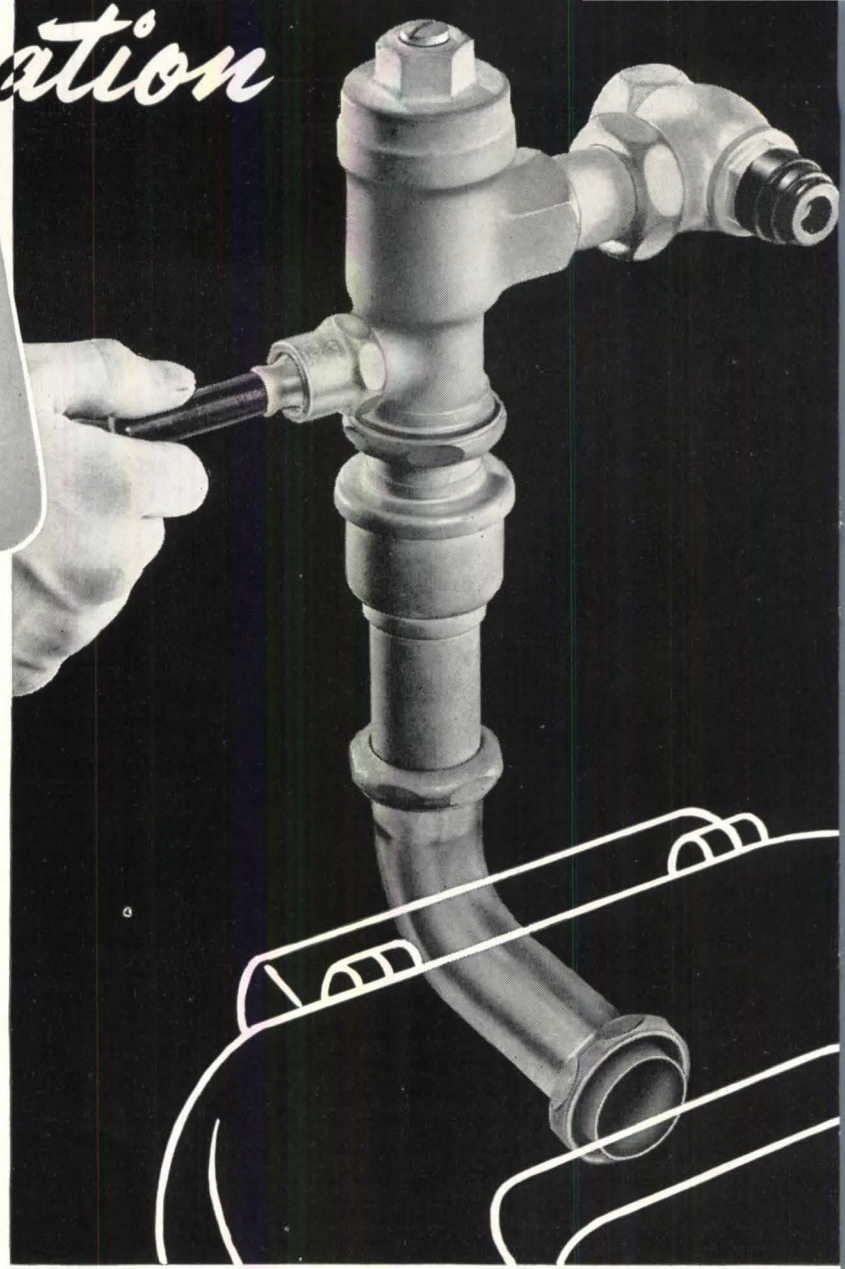
—for the Duration

THE "V" MODEL Watrous FLUSH VALVE



Conserves critical war materials . . .
Meets War Department Spec. PE-623
Built to give lasting, reliable service

• • • —

WAR projects must have flush valves that are highly dependable . . . long-lived . . . water-saving. Yet the critical materials used in the manufacture of such valves must be held to the minimum.

To meet this need, Imperial developed and is concentrating its production for the duration on Watrous "V" Flush Valves. These valves save brass, bronze and other extremely critical metals required for the war. They conform to War Department Specification PE-623 and are approved for use on government projects.

These "V" model valves retain, however, Watrous proved design and excellence of workmanship, and they will give lasting, economical service.

As will be noted from the illustration at right, Watrous "V" Flush Valves are similar in general appearance and features to the well known Watrous "Jewel" Flush Valve. The alternate materials used in place of brass and bronze in these valves have been selected with extreme care to the end that efficiency and dependability will be retained.

It is important to note that all vital working parts of the valve remain brass, a vital point in assuring long, trouble-free service.

For detailed information on Watrous "V" Flush Valves and the combinations to use to comply with War Department Specifications, write for Bulletin 858-W, or see the 1943 Sweet's Catalog File, Section 27, Catalog No. 39.

THE IMPERIAL BRASS MFG. CO.

1240 West Harrison Street, Chicago, Illinois

"V" Model retains Watrous proved design and excellence of workmanship

Like all Watrous Flush Valves, the "V" model offers a water-saver adjustment. This enables valve to be regulated to MINIMUM water requirements of fixture by a slight turn of the adjusting screw.

• • • —

Advantages of Watrous system of "Single-Step-Servicing" are fully embodied in this valve. Under this system complete operating unit may readily be lifted out. This makes possible quick, convenient replacement of worn washers, etc., if ever necessary.

• • • —

Valve is shown complete with vacuum breaker which provides positive protection against back-siphonage.

QUICK REFERENCE CHART

Showing Watrous 'V' Flush Valve combinations which correspond to various Item Nos. in War Dept. Spec. PE-623

War Dept. Spec. No.	Watrous Combination to Use	War Dept. Spec. No.	Watrous Combination to Use
Item P-1	WD-933-WVB	Item P-6A	WD-932-VB
Item P-2	WD-949	Item P-30	WD-939-VB
Item P-3	WD-949	Item P-31	WD-939-VB
Item P-4	WD-949-VBF	Item P-32	WD-941
Item P-6	WD-932-VB		

Watrous Flush Valves

WASHINGTON NEWS

By J. MAXWELL DICKEY

Postwar Planning • CMP and Construction • Construction Industry Exempted from Price Control • Materials Conservation Requirements • Construction Decentralization • War Housing Conversion • New WPB Inspection

REGARDLESS of Congressional attitudes toward the National Resources Planning Board, many top figures in Washington frankly confess that the recent postwar program released by that Board has done much to make official Washington conscious of adjustments to come after the war ends. The report, issued by NRPB, has been variousy described as "Socialism" and "Magnificent—a decided step in the right direction." No actual Capitol Hill action can be expected on postwar problems or the recent NRPB report during this session of Congress.

Aside from the social security program which attempts to establish an individual economic stabilization from "the cradle to the grave," the most talked of aspect of postwar planning seems to center on a probable giant-scale construction expansion financed by both Government and private industry. This includes urban construction housing as well as modernization of existing structures, both residential and industrial.

Most of the states have established some form of postwar agency for individual state programs. Some of the more progressive of them already have begun to program necessary public works projects such as schools, public buildings and new highways. After the war many war workers will give up their present makeshift living accommodations in production centers and return home, creating a market there for new low-cost housing. Far-sighted officials in the Rural Electrification Administration predict an expansion of their program beyond their greatest expectations. This will of necessity mean a revolutionary revision of rural homes and farm structures.

NHA and FHA officials are rather reluctant to discuss the part their agencies might play in future developments, but their enthusiasm over probable Government - financed housing projects is easily detected. A note of caution is sounded by all Government officials to the effect that private industry and capital will be vitally essential in any postwar construction program. An undercurrent of unofficial talk in the Treasury Department seems to answer this cautionary attitude by outlining various types of "incentive tax" programs for private businesses after the war. A private business that may release capital for plant or housing expansion will probably be given a decided advantage from a tax standpoint. This will lend great encouragement to privately financed construction.

Many WPB officials believe that shortages of critical materials will continue to exist for some time after the war and that many changes in design will have to be made in construction in order to carry out any postwar building program. The use of certain plastics and alternate materials, heretofore only suggested or manufactured solely for exhibition purposes, will become commonplace in new construction materials and methods. The part that architects will play cannot be overemphasized according to one high-ranking official in the Construction Division of the War Production Board. He continued, "Architects will be basically responsible for all immediate postwar construction under a financially restricted, as well as a materials restricted, United States."

Indicative of the thought being devoted to future planning is the postwar program pertaining to highway construction now being formulated by 22 states. The U. S. Public Roads Administration says that these states are already preparing detailed plans for roads and bridges at an estimated cost in excess of $170,000,000.

CMP and Construction

CMP Regulation 6, which governs construction under the Controlled Materials Plan has been kicked around

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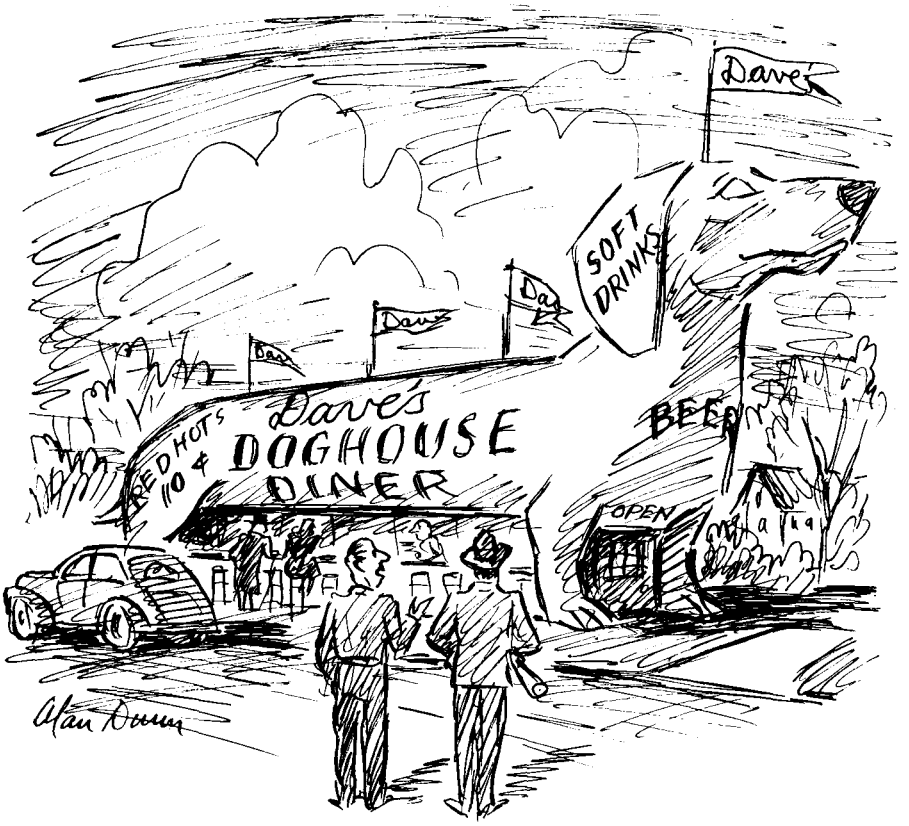


"I want it remodeled into a St. Bernard."
—Drawn for the RECORD by Alan Dunn

1941

The "contact" that calls in the nurse . . . Quickly, silently, her fingertips bring her instant service. Edwards hospital communications are typical of the peacetime equipment that brought added efficiency to thousands of institutions, homes and factories throughout America.

1943

The "contact" that caves in U-boats . . . The shark-like shadow is sighted. The command is given. An Edwards device activates the Y-gun . . . And depth charges doom one more Axis marauder. This is typical Edwards wartime equipment for Army, Navy, and Merchant Marine.

194? How does a Y-Gun fit into your future?

● As American sub-chasers lash through Axis-infested waters, the Y-gun is the grim sentinel that stands guard over Allied shipping. Today, the Y-gun looms in importance in your life. It brings peace just one step nearer. But, here's what it means for tomorrow . . . the Edwards engineering brains that created the Y-gun contact switch and many other high-speed communications of war will be ready, at a moment's notice, to contribute to the blessings of peace. Amidst 100% war production, Edwards' Post-War Research steadily progresses to assure the mass manufacture of improved communications equipment, signal and alarm systems for peacetime America.

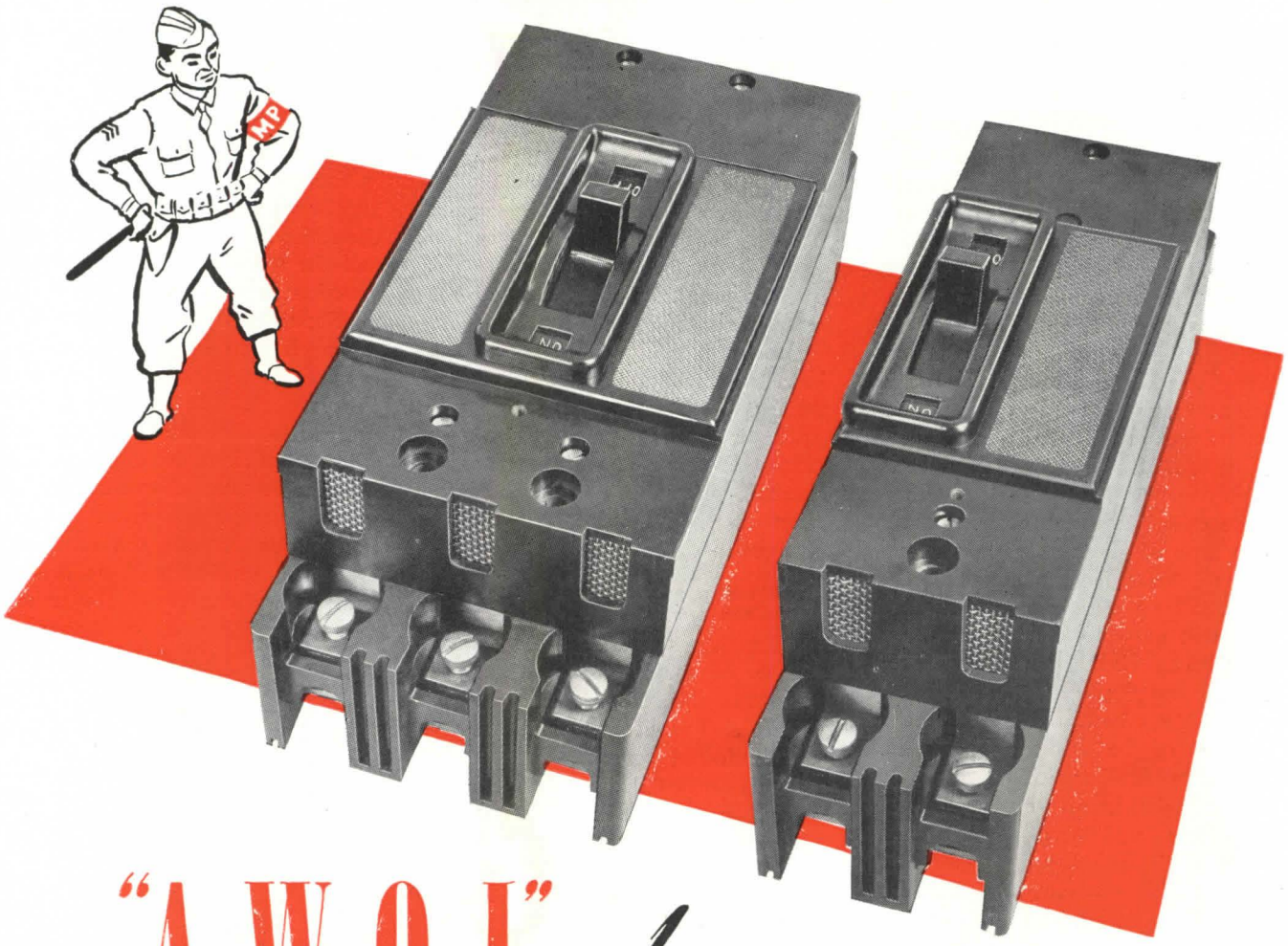
ARMY E NAVY

Edwards and Company, Norwalk, Conn.

EDWARDS

SINCE 1872

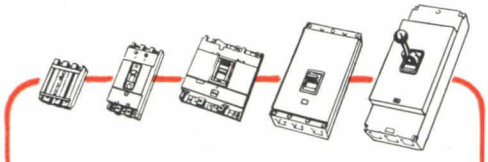
Communication Equipment for Homes, Institutions and Industry



no "A.W.O.L."s here

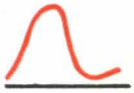
WESTINGHOUSE NOFUZE BREAKERS ARE ON ACTIVE DUTY—

mobilized to protect war circuits



NOFUZE "DE-ION" BREAKERS

prevent *harmless* overloads from interrupting war production.



protect circuits from *dangerous* overloads and "shorts".

restore service *instantly* with just a flip of the switch.

Absent? Yes. Absent for the duration from peacetime applications because the Westinghouse production of Nofuze Breakers is devoted to war requirements.

But far-reaching improvements are resulting from this wholehearted participation. For example, in the new line of "F" Frame Breakers, all ratings from 15 to 100 amperes have been redesigned into one compact frame size. Instead of 14 different models, 4 now serve the same purpose.

In a typical panel, the new breaker results in a saving of 38% of the steel and 18% of the copper over present panels. And although the new breaker is smaller and weighs less than half of some of the superseded units, it has better performance.

Westinghouse engineering facilities have been placed on a broad consulting basis to help with the job of protecting vital war circuits from unnecessary interruptions. Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania.

J-60522

Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

NOFUZE CIRCUIT PROTECTION

(continued from page 7)

WPB more than all of the other regulations combined. Several drafts of the proposed constructions regulation have been completed and made ready for release. Each time they have been withdrawn because of additional changes. Officials have been frank to state that there has not been the necessity for speed in issuing this regulation that there was for other industries under the new allocation program. L-41 with its various amendments has kept a tight control on construction and materials for a long time. CMP will have little effect on whether or not a certain type of construction may be approved, restricted or stopped. It is essentially a procurement procedure and will not directly affect architects.

WPB has also advanced another reason for postponing the issuance of the new CMP construction regulation. A revision of the processing procedures and a standardization of forms is being completed. All current construction jobs authorized in accordance with WPB orders prior to February 17 have been assigned to individual claimant agencies. Claimant agencies have contacted jobs under their jurisdiction and have requested applications for controlled materials.

In the case of construction projects authorized since February 17, instructions will be issued to the consumers involved which will designate the proper Claimant Agency to which applications for controlled materials are to be directed. All applications for authorization to commence construction will, for some time to come, be handled as in the past under L-41. Preference ratings assigned to construction projects may be applied or extended only for the purpose of acquiring those items of materials specifically approved in connection with the issuance of the authorization to construct.

In connection with the Controlled Materials Plan, and of particular importance to architects and industrial designers, is the new "Master Scheduling Order"—M-293. This order classifies critical components into three overlapping categories in accordance with the severity of their respective shortages. M-293 takes precedence over all existing preference ratings. Certain items are brought under this order as critical components which have formerly been construction "musts." Such equipment as fans and blowers, conveying machinery, certain types of power boilers and many other essential construction necessities are listed under the new scheduling order. Before such critical components can be obtained, regardless of preference ratings, WPB must place any order on an approved schedule. This will mean that construction planners must ascertain whether or not certain equipment can be obtained and if not, changes in design must be made.

Construction Industry Exempted From Price Control

OPA has announced that it will revoke Maximum Price Regulation No. 251 which controlled prices on construction services, sales of building and industrial equipment and materials on an installed or erected basis. Price Administrator Prentiss M. Brown observed that the need for rigid control of prices in the industry no longer exists because of the decline in construction of private projects. All general contracting activity and many types of subcontracts for jobs on new dwellings and industrial plants will be formerly excluded from price regulation. Those construction activities which are determining factors in preserving rent ceilings will remain under pricing control by means of specific regulations.

The sale of such materials as roofing, flooring and siding when made on an installation basis will remain under OPA control. Although the formal revocation of the construction price regulation has not yet been effected, the requirement of filing reports under the provisions of MPR No. 251 has been eliminated. OPA is compiling a list of specialized lines of contracting and installed sales.

Materials Conservation Requirements

NHA has established procedures clarifying the application of materials conservation requirements to privately financed war housing. This clarification implements the joint policy declaration of WPB and NHA concerning the use of critical materials in connection with the official War Housing Construction Standards and War Housing Critical Lists.

The outstanding feature of NHA's regulations is that the provisions of the revised War Housing Critical List and the Revised War Housing Construction Standards will apply without qualification to private projects where the application for priority assistance is acted upon favorably by FHA after February 17. The newly established procedures also clarify the situation where conditions have changed and have necessitated downward revision in the established private construction quotas for any critical housing area. The revision will be met first through withdrawal of the unissued quotas for the area, or through recapture of outstanding preference rating orders which will not be used because of the changed condition. FHA will recommend that WPB recapture outstanding preference ratings only if the builder has performed no substantial work on the project. Even in this case, FHA, with the concurrence of the NHA's Regional Representative may not recommend recapture if it is determined that such action would result in undue hardship.

Construction Decentralization

Following closely the decentralization program being carried on in WPB, authority to begin residential, agricultural and many other types of commercial construction has been turned over to the 12 WPB Regional Offices. The one limitation placed on this authority is that the cost of the construction must be less than $10,000. Under the new procedure, "banks" of materials are being established in the various WPB Regional Offices. The Regional Directors may make necessary allotments of controlled materials under this program simultaneously with the issuance of authority to begin construction.

Publicly financed housing projects and privately financed war housing units to be constructed under Title VI of the National Housing Act are not affected by this new procedure. Publicly financed housing construction applications will continue to be processed in the Construction Division in

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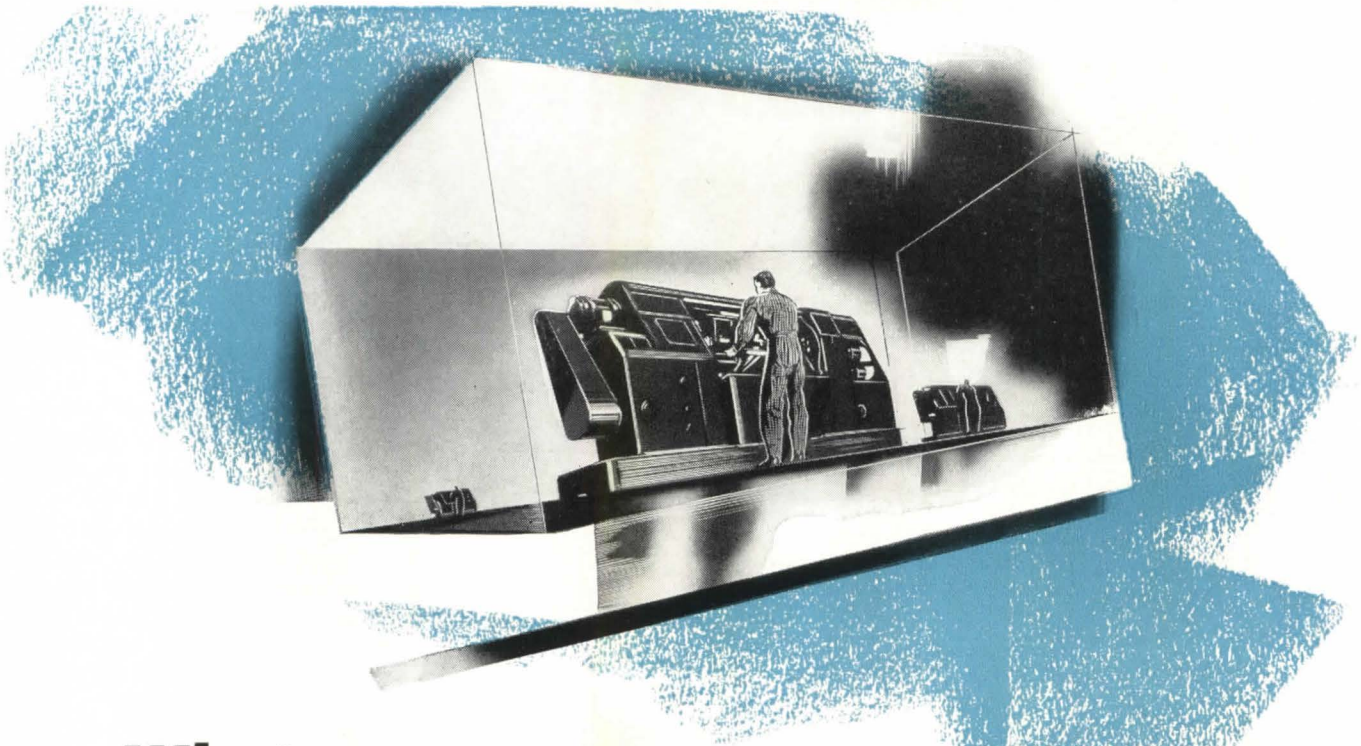


Whatever the Shape of Things to Come

. . . Air Conditioning must be in the forefront of every conception of indoor space. Industry has joined Business in accepting Air Conditioning as a factor of economic necessity in making man-hours and investment count in fullest measure. The tenant for rental space of every kind will expect conditioned air as a matter of course.

It is with this vision of the embodiment of Air Conditioning equipment specifications in your every project that Worthington is planning its after-the-war designs. The 50-odd years of refrigeration machinery specialization, which will be in back of the mechanical units, is a strong Worthington asset. Sound engineering is the rock on which this business is grounded. But designing for tomorrow takes in more than that. Worthington is designing from the customers' viewpoint, also—with size, shape and proportion on a par with operating efficiency.

Worthington will want architects and engineers to have the advantage of knowing that such equipment will be available. It can be important in your planning.

☆ As you begin to work on specific projects, we suggest you draw the nearest Worthington office into consultation.

Worthington Pump and Machinery Corporation, Harrison, N.J. District Offices and Representatives in Principal Cities. CA3-13

Air Conditioning

WORTHINGTON

AND WORTHINGTON REFRIGERATION

Looking Ahead in Air Conditioning with Dr. Willis H. Carrier

DR. WILLIS H. CARRIER, *Chairman of the Board, Carrier Corp., and "father of modern air conditioning," needs no introduction. Kinetic Chemicals, Inc., is pleased to present his thoughts, in this, the first of a series of messages addressed to architects on air conditioning for present and postwar building.*

"ONE of the greatest opportunities for extending the benefits of air conditioning in the early postwar period will be in office buildings, hotels and the better class apartment houses. Although many individual rooms will be conditioned with self-contained type units, if this market is to be fully developed, air conditioning must be made wholly adaptable to existing buildings, as well as to new buildings. Economy in cost and space will require a revolutionary design employing a minimum of ductwork and the concentration of all machinery in a central plant.

"The ideal air conditioning system for such buildings must be especially adaptable to existing architectural requirements. It must use much less floor space; not infringe on head-room space; be suitable to old as well as to new buildings; not restrict acceptable structural practices nor interfere with interior arrangements. Functionally, it must maintain high quality comfort air conditioning; provide each room occupant with individual control; give desired results regardless of wall exposure, sunlight, number of room occupants, normal lighting and outdoor weather variations, heating some rooms while cooling others, . . . and operate quietly. Ideally it must combine the winter and summer services in one system. Since one of the greatest benefits of air conditioning is to be found in the absence of dust and dirt that comes through open windows, heating and cooling means, together with suitable control, must be provided for each individual room.

"The advance in the art of air conditioning now permits such requirements to be approached at costs that are reasonable in view of the advantages offered. When building owners and occupants realize that they may have true air conditioning in all seasons of the year at moderate cost, the potential market for air conditioning will be very large."

THE RECORD REPORTS

(continued from page 10)

New York. Privately financed applications are already being processed in the field. Industrial construction such as expansion of war plant facilities will continue to be handled in the New York Office.

War Housing Conversion

The National Housing Agencies Home Use Service has issued a report which shows a remarkable progress in converting various types of structures into family dwelling units for war workers. By means of unique remodeling plans, NHA has effected the conversion of tourist camps, armories, orphanages and many other little used buildings into modernized adequate family dwelling units. NHA Administrator John D. Blandford, Jr. has stated that leases signed up to March 1, 1943 will provide more than 1,300 additional living units for war workers and their families. Several thousand units are now being negotiated for additional conversions. The best guide to this conversion program may be determined by the areas in which critical war housing shortages exist, such as the Connecticut industrial areas and midwestern war boom towns.

New WPB Inspection

WPB and NHA have agreed to establish a compliance inspection service under which FHA officials will conduct periodic inspections of houses under construction. FHA will check against the approved materials list and the materials actually going into construction.

In the past, FHA field officials were required to sign all purchase orders for rated materials to show suppliers that the use was justified in the particular construction project. That policy has now been changed and WPB has announced that purchase orders for rated materials going into privately financed housing construction will no longer require the certification by FHA field offices.

★ ★ ★

WASHINGTON POSTWAR STUDIES

The Washington, D. C. Chapter of the A.I.A. has announced the appointment of a Planning Committee to study some of the many problems raised by the war and apt to develop in the postwar period. One important

(continued on page 14)

Is This Destruction Necessary?

Not a bombed area – 17 buildings destroyed by fire in the business district of a mid-western city.

Pier fire destroys vital supplies – $2,000,000 damage. 3000 ton ship destroyed, 34 barges damaged.

Railroad terminal. Complete destruction of grain elevator, warehouse and a long string of loaded freight cars.

Aircraft parts were made in this "fireproof" building – until fire struck leaving it a mass of twisted metal.

• • •

Every day, warehouses, piers and plants far from the battlefronts are going up in smoke. Terrific losses of vital war plants and equipment result . . . production is tied up . . . our fighting forces wait for supplies that do not arrive. The fire loss in the United States for 1942 was $314,849,000.

Fire can be Controlled There is one sure way of checking this destruction of millions of dollars worth of badly needed materials and supplies . . . AUTOMATIC SPRINKLERS. Dependable, automatic, a Grinnell Sprinkler System detects and checks fire before major damage can occur. 8000 fires have been put out since 1930 with Grinnell Automatic Sprinklers.

Protection for so Little One sprinkler head protects 100 square feet of building space. Installed, it requires only about 50 lbs. of pipe, fittings, hangers and valves to serve it, yet it can save tons of structural steel and other critical building materials. Its 24-hour-a-day protection can prevent destruction of millions of dollars worth of war material and keep plants running that would otherwise be twisted ruins. Why take chances when protection requires so little?

Grinnell Company stands ready to protect your warehouse or plant against fire. Experienced engineers at nearby offices are ready to help you. Call them. Grinnell Company, Inc., Executive Offices, Providence, R. I. Branch offices in principal cities.

GRINNELL

AUTOMATIC SPRINKLERS

For Production Protection

THE RECORD REPORTS

(continued from page 12)

job of the Committee is preparation for making the plans which must be the basis of the huge program of postwar building expected by both private industry and the Government, including the conversion of war plants to peace use, as well as the construction of domestic, commercial, industrial and public works projects put off until after the war.

In order to cover the many aspects of the proposed program, the Committee will be divided into seven major groups. One group will be concerned with the effects on the profession of various social conditions, economic and political situations after the war; another will work on problems of urban planning; a third will study new developments in materials, building codes and standards and construction methods; others will deal with large-scale housing, public works, architectural education and relationships with engineers, builders, labor organizations, real estate brokers, financing organizations.

The Planning Committee groups are made up of private and Government architects together with landscape architects, city planners, engineers, economists, lawyers, and other specialists in the field of construction. Fifty working members already are enrolled in these units with an equal number of specialist consultants. The Chairman of the Committee is Albert Charles Schweizer, Director of the New York University School of Architecture and Allied Arts, at present working with the National Resources Planning Board on the development of plans for certain cities in the United States which have been seriously affected by the war.

The Committee expects to coordinate its work with the National Postwar Reconstruction Committee of the American Institute of Architects, the Producers Council, the Building Congress, and various engineering societies active in this field.

HOUSING FOR WAR WORKERS

Charging that acute housing shortages throughout the nation have interfered seriously with the recruitment of essential workers in war production communities, the National Committee of Housing Associations has called on

(continued on page 16)

ADD *Aluminum in Color* TO YOUR POSTWAR THINKING

Aluminum finished in bright colors and pastels, in black, silver and gold, with bright and matte surfaces; colors dyed right into the metal. This is no idle dream. It's an actuality, something on which you can safely let your postwar thinking dwell.

Research has been at work constantly, seeking better finishes for the aluminum that is going into airplanes, parts and accessories. They've found finishes that give greater resistance to corrosion, better adhesion for paints, blacks for reduced visibility, colors for identification.

Architects are always seeking new ways of expressing themselves, of achieving unusual and more beautiful effects. These finishes for aluminum offer a means of expression. Of course, you can't start using them now, nor the metal, but it's none too early to be thinking thus—

Aluminum, with its lighter weight, easy and faithful fabrication, ability to resist corrosion, adds color to its surroundings. ALUMINUM COMPANY OF AMERICA, 2167 Gulf Building, Pittsburgh, Pennsylvania.

ALCOA ALUMINUM

THE RECORD REPORTS

(continued from page 14)

various Federal agencies to revise the present war housing program so that essential workers "can be assured a place to live."

The Committee adopted a six-point proposal aimed at speeding up the classification and certification of workers who should receive first consideration for war housing and dwelling space, and sent its recommendations to the War Manpower Commission, WPB, NHA and OPA.

The recommendations as summarized by the committee call for:

1. Establishment of War Housing Centers under NHA to assure adequate housing of workers in all war production communities where housing conditions are critical.
2. Certification of applications for war housing by the War Manpower Commission to local War Housing Centers.
3. Creation of an advisory board within local War Housing Centers of local representatives of NHA, WMC, WPB and OPA.
4. Compulsory registration with War Housing Centers of all vacant dwellings or other structures capable of conversion.
5. Issuance of an Executive Order by the President granting powers to NHA to lease vacant buildings.
6. Initiation of a program for utilizing excess space in occupied dwellings in war congested areas.

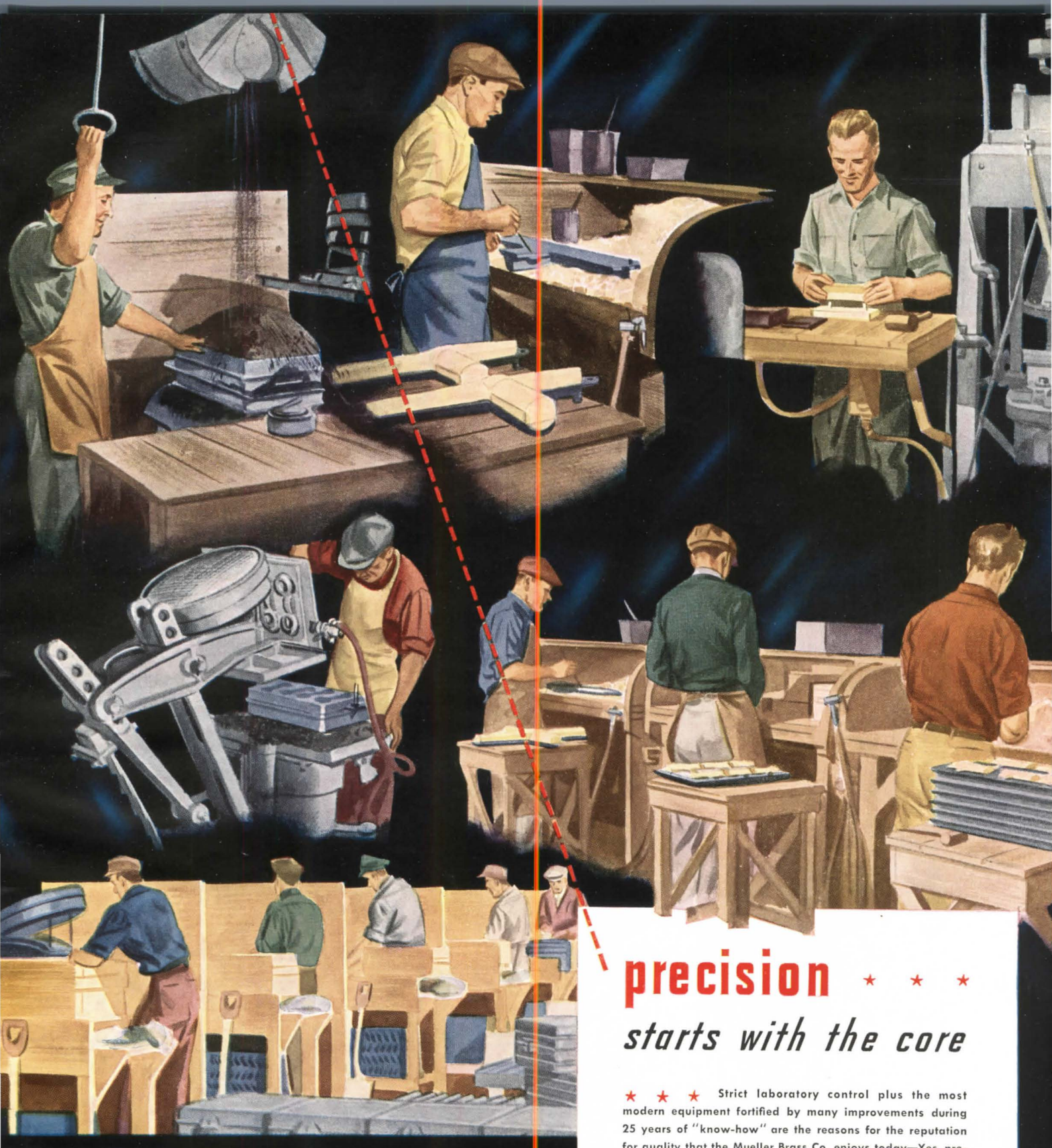
MANUFACTURERS' DATA AND SAMPLES WANTED

The Department of Architecture and Fine Arts, University of Manitoba, Winnipeg, Canada, would like to receive information on new construction methods, materials, finishes, and fixtures, and samples of new products, for its collection of materials.

(continued on page 98)

DESIGNER WANTED

Wanted: Show Case Designer and Detailer, experienced in design and layout of Moderne Show Cases, and Display Cases for spot selling. Prefer a man with an Architectural Engineering education, but not absolutely necessary. State age, experience and salary desired. Middle west location. Excellent opportunity for right man. Box 150, ARCHITECTURAL RECORD.



precision ★ ★ ★

starts with the core

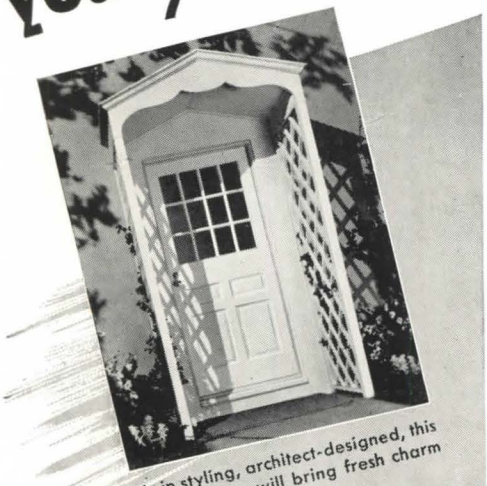
★ ★ ★ Strict laboratory control plus the most modern equipment fortified by many improvements during 25 years of "know-how" are the reasons for the reputation for quality that the Mueller Brass Co. enjoys today—Yes, precision starts at the very beginning in the manufacture of STREAMLINE fittings—**precision starts with the core.**

Today modern equipment and mass production hasten STREAMLINE fittings through the coremaking department, on through foundry and machine shops to our armed forces for installation in fighting ships of all kinds.

When the post-war period dawns, an improved and extended line of STREAMLINE products will have their full share in the rebirth of America and the world in the building of better homes for its people. STREAMLINE bronze fittings and STREAMLINE copper pipe will once more protect the health of the nation as they are now protecting the health and lives of our men in the service.

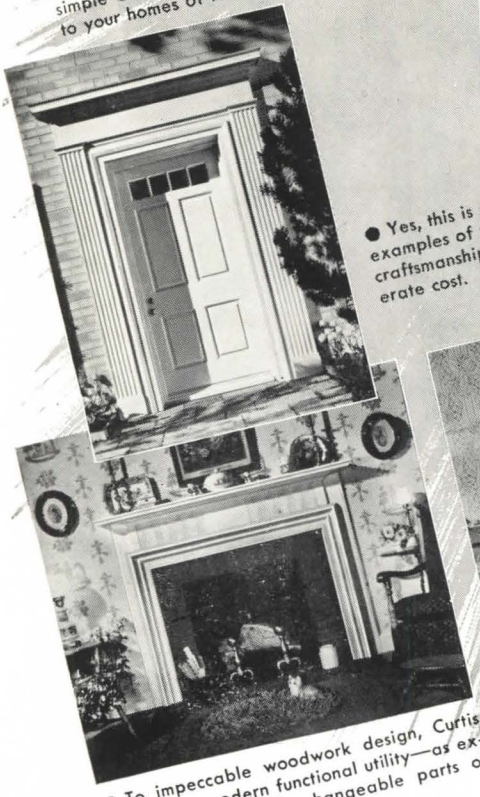
STREAMLINE
PIPE AND FITTINGS DIVISION
MUELLER BRASS CO.
PORT HURON, MICHIGAN

Let beauty sit in on your post-war planning



● Authentic in styling, architect-designed, this simple Curtis entrance will bring fresh charm to your homes of tomorrow.

THEY'LL be hungry for *beauty*—those post-war clients of yours! They'll want their homes to have the grace and charm they have pictured in their dreams. Yet they'll want *low cost,* too. How can Curtis stock woodwork help you meet these needs? Why can Curtis woodwork help you meet them *better?* These pictures—including some of the *new* low cost designs in the Curtis line—may give you the answer . .



● Yes, this is stock woodwork—one of many examples of the way Curtis provides quality craftsmanship for the home at low or moderate cost.

● To impeccable woodwork design, Curtis has added modern functional utility—as exemplified in the interchangeable parts of this low cost mantel.

● No post-war home need lack a mantel of enduring beauty—thanks to Curtis—pioneer manufacturer of woodwork that meets every standard of good taste.

● You would expect such fine detailing only in the most expensive woodwork. This is one of the newer designs of Curtis China Closets.

● This beautiful stairway was assembled from Curtis stock stair parts. The Curtis line includes distinctive stairwork for all architectural styles.

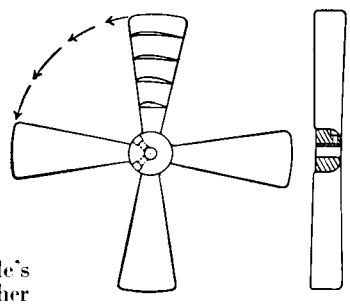
As an aid in planning the homes of tomorrow, we should like to send you our book *"New Woodwork in Tune with the Times."* You'll find this full of new woodwork ideas by some of America's outstanding architects. Mail your request to Curtis Companies Service Bureau, Dept. AR4W Curtis Bldg., Clinton, Iowa.

1866 CURTIS WOODWORK

4 REASONS why PROPELLAIR Fans are Better for Industrial Ventilating Jobs!

1 AXIAL, AIRFOIL PROPELLERS

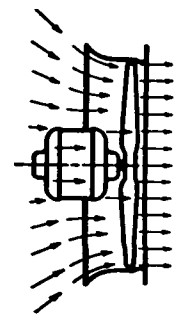
Deliver Maximum Air with Minimum Horsepower



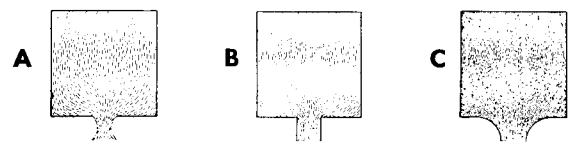
It is obvious that a fan blade's tip moves farther than other parts of the blade. So in order to get *even* air flow throughout the entire ring diameter, Propellair engineers designed special *axial, airfoil* propellers with pitch and thickness increasing toward the hub. (See sketch.) The result is maximum air delivery per horsepower because the *whole* fan works—not just the tips! These unique propellers are also non-overloading. From free air to complete block-off, horsepower remains virtually constant as long as motor speed remains constant. The number of blades, and their pitch and shape, depend on the job to be done.

2 CURVED ENTRANCE RING—

An Exclusive Propellair Feature that Increases Fan Efficiency



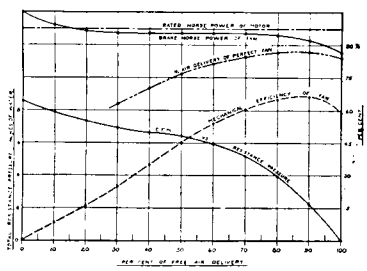
The principle of this feature is best explained by the small sketches below. The square-edged outlet in Fig. A, without nozzle, cuts down air flow to 62% of maximum. The cylindrical nozzle in Fig. B is better, but air flow is still only 82% of maximum. The curved nozzle in Fig. C, which is the principle employed by Propellair, permits air flow *99% perfect!* Thus Propellair uses the entrance ring (utilized in ordinary fans only as a mounting device) to increase fan efficiency. This improvement was introduced by Propellair engineers in 1930 as a result of exhaustive tests and experiments.



3 CERTIFIED RATINGS

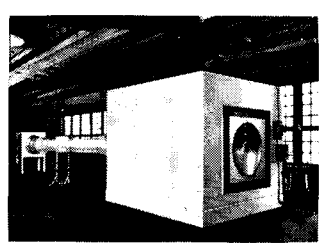
Assure Peak Performance

A certified performance curve like this is available on any Propellair Fan ➔



This label is your assurance that Propellair Fans are properly tested and accurately rated. It is issued to a fan maker only after the Propeller Fan Manufacturer's Association (PFMA) is satisfied that the applicant's fans have been tested in accordance with the Standard Test Code as adapted by the American Society of Heating and Ventilating Engineers (ASHVE). Propellair Fans were among the *first* to receive the PFMA label.

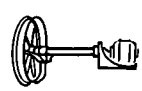
PROPELLAIR FAN-TESTING LABORATORY



The wind tunnel and fan-testing equipment in Propellair's modern laboratory conform strictly to the revised edition of the Standard Test Code for Centrifugal and Axial Fans, prepared jointly by committees of the National Association of Fan Manufacturers and the American Society of Heating and Ventilating Engineers.

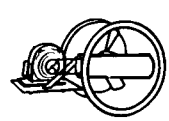
4 A PROPELLAIR FAN FOR EVERY APPLICATION

CD—Direct connected to electric motors. For ducts, hoods, roof ventilators or panels.

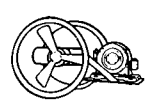


CE—Extended shaft fans for ducts, dryers, etc., where motor must be outside the air stream.

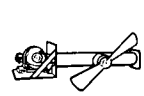
CF—For belt drive from separate motors, engines or line shafts. Also with extended shaft assembly.



CS—Heavy-duty complete belt-driven unit in duct section. For severe dust, corrosive or explosive vapors.



CSV—Heavy-duty complete belt-driven unit for high temperatures in ducts, pipes, and as stack boosters.



CSB—Heavy-duty complete belt-driven unit for ducts or stacks to handle explosive vapors, dust, or high temperatures.

CU—Low-stand, tiltable, portable cradle fan for hardening-room service, product drying or cooling.

CM—Heavy-duty pedestal blast fan for cooling men and products in heavy industries.

C—Industrial circulator fan for general air-circulating service of all types.

CB—Slow-speed, ultra-quiet complete belt-driven fan. For office or room ventilation.

If you have a pressing industrial ventilating problem, *write us!* We'll either mail you our complete Propellair catalog No. 10-F—or have the nearest Propellair ventilating specialist get in touch with you—whichever you prefer.

On the other hand, if you'd like more information for *future* reference, and not in connection with a specific war-production job, see our 20-page insert in Sweet's Catalog for 1942.

PROPELLAIR INC.

"Moving Air Is Our Business"

SPRINGFIELD • OHIO

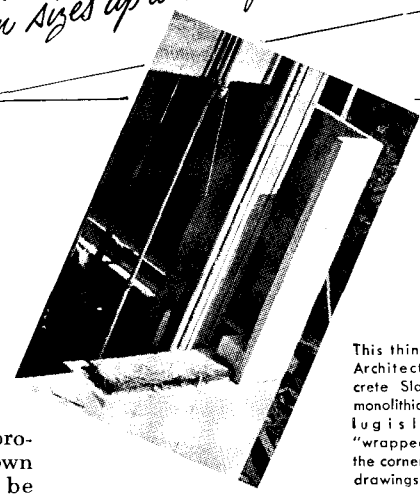
Wrapping up a building in ARCHITECTURAL CONCRETE SLABS

ARCHITECTURAL CONCRETE SLABS

#2

Notes on the design, use and installation of thin, precast Architectural Concrete Slabs-prefabricated, concrete building units made in varied shapes, and in sizes up to 100 sq. ft. or more

Varied shapes of thin, prefabricated units curve around corners, sills, heads and cornices



This thin, precast Architectural Concrete Slab with a monolithic anchoring lug is literally "wrapped around" the corner. (Also see drawings below.)

THIN, precast Architectural Concrete Slabs are decorative, structural units only about 2" thick, made of strong, durable, heavily reinforced concrete. They are precast in varied sizes and shapes with or without integral returns, such as sills, lintels and copings. The face, plain or patterned, and cast monolithically with the slab, is brushed and washed to expose and reveal selected aggregates in their true colors and natural textures against a matrix of Atlas *White* cement.

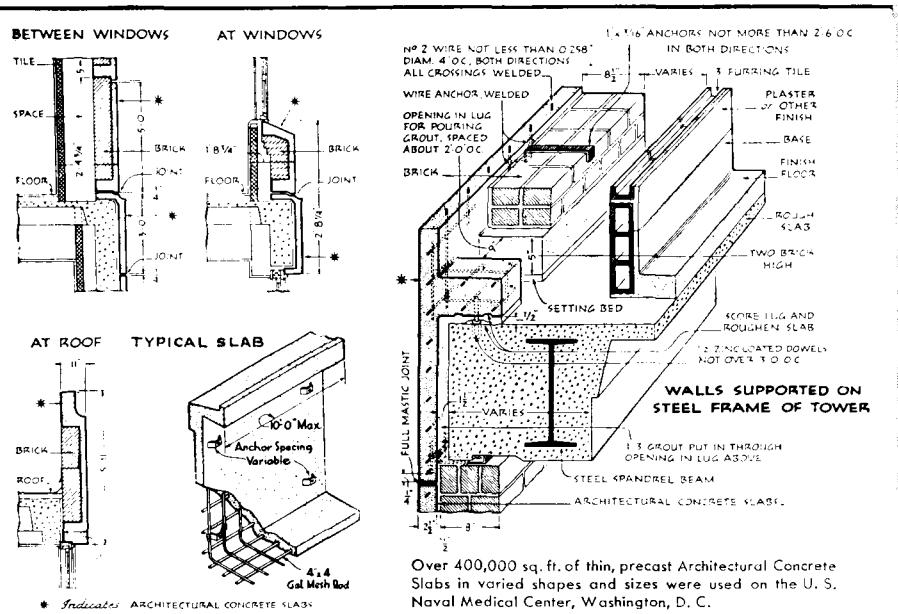
Shapes include rectangles, angles, channels and curved sections. They may be solid or pierced, plain surfaced, fluted or recessed, in solid colors, or of any other decorative design.

The slabs fundamentally are designed as a covering for other materials—a protective and decorative surface. As shown in the illustrations, they may be "wrapped" around corners and cornices. Lugs, cast monolithically with the main section, may be formed to receive windows and door bucks. Lugs also are used to anchor and interlock the thin, precast slab with the back-up material. Spandrels, including window head below and sill above, may be made in a single piece. This reduces the number of joints, the cost of flashing and water proofing, and the cost of erection.

See Section 4-14 in Sweet's Architectural File, or write for the new book, "Architectural Concrete Slabs," which tells of the shapes, colors, textures, and the architectural and structural advantages of this thin, precast, versatile building material made with Atlas *White* cement. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York City.

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

AR-ACS-38

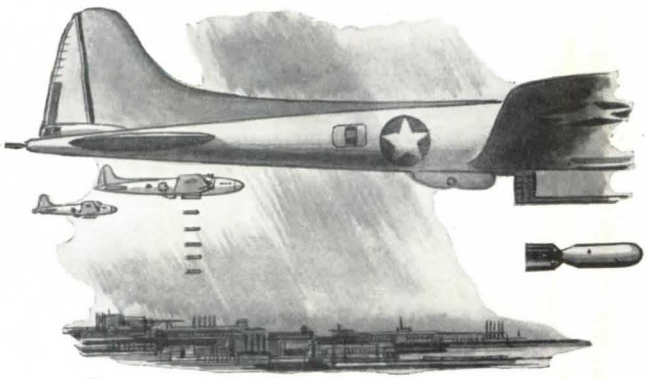


Over 400,000 sq. ft. of thin, precast Architectural Concrete Slabs in varied shapes and sizes were used on the U. S. Naval Medical Center, Washington, D. C.

Koppers "C & C"* Projects

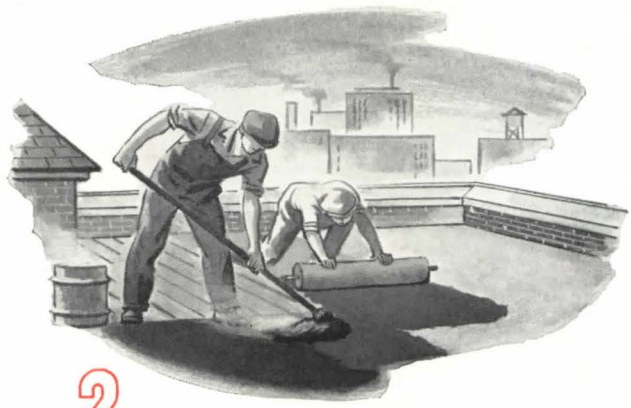
*Current and Contemplated

Tar and Chemical Division



1 Current

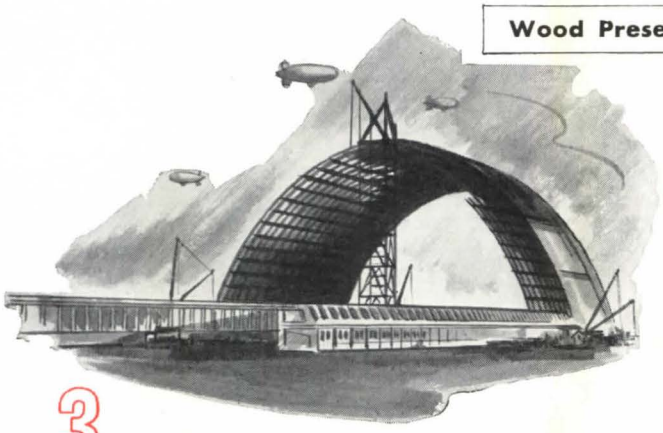
Tar that once roofed American factories now "unroofs" German factories—Coal derivatives which used to go into coal tar roofing pitch are now one of the richest sources of war-vital materials for electrodes (used in electric furnaces to produce aluminum).



2 Contemplated

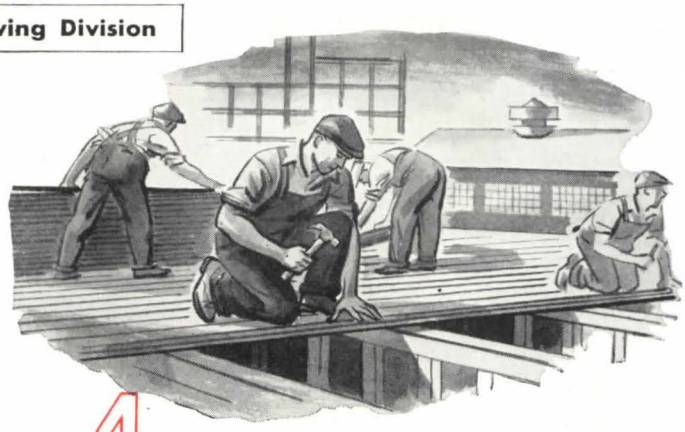
Wartime roofing proves anew that coal tar is best—In one war factory alone, more than 200 railroad carloads of Koppers roofing was used. On vast roofing projects like this, valuable lessons have been learned in roofing . . . and the best advice still is: "Stick to coal tar."

Wood Preserving Division



3 Current

Pressure-treated timber replaces critical metals to speed war production—The proven ability of pressure-treated timber to serve for years under extreme conditions of exposure provided a huge reservoir of construction materials for war industries and for essential civilian uses. Millions of board feet have been treated in Koppers pressure-treating plants to resist fire as well as decay and insects.



4 Contemplated

Air-conditioning brings need for pressure-treated timber—Air conditioning is often used to maintain a relatively high degree of humidity, which is conducive to decay. Factory owners have found Koppers pressure-treated timber immune to decay. Use pressure-treated timber in roof decks, trusses and other places exposed to moisture—Koppers Company, Pittsburgh, Pa.

KOPPERS

THE INDUSTRY THAT SERVES ALL INDUSTRY

INSTANT AUTOMATIC *EMERGENCY LIGHTING* PROTECTION

Exide's LIGHTGUARD

A COMPLETE EMERGENCY LIGHTING UNIT

DESPITE all precautions of utility companies, storms, floods, fires, street accidents, and sabotage may damage the electric lines leading to your plant, or plants you design, and plunge them into disastrous darkness. At such times, the new Exide LIGHTGUARD serves an invaluable purpose.

This completely self-contained unit operates instantly and automatically. It is designed to be installed on walls or posts, and its sealed glass automobile driving light will furnish sufficient illumination to permit necessary operations at your control switchboards, valves, gauges, and other devices in boiler and engine rooms. It permits you to stop machines safely, and aids in control of vital work. Further, Exide LIGHTGUARDS can be used as portable lights, if required.

Completely self-contained, these units are automatically maintained in a state of charge. Defense plants, ordnance plants, chemical plants, refineries, and arsenals can find many uses for these dependable Exide LIGHTGUARDS.

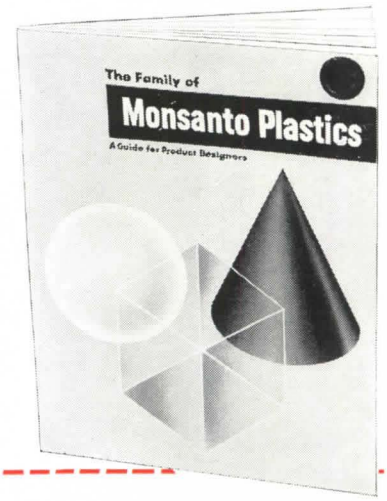
For full details about this important Exide contribution to industrial safety, write and ask about the Exide LIGHTGUARDS.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
Exide Batteries of Canada, Limited, Toronto

This new Exide Lightguard is completely self-contained and offers these important points:

1. No fixtures or wiring required, except a connection to the A. C. supply by the cord and plug furnished with the unit.
2. Low price.
3. Lights an area of 7500 square feet.
4. Self-contained, automatic operation and automatic charging.
5. Long-life, thick plate Exide Battery with visible pilot balls.
6. A selenium trickle charger which automatically recharges battery when A.C. supply is restored to the unit.
7. Can be used as a portable light, if required.

Exide
EMERGENCY BATTERIES



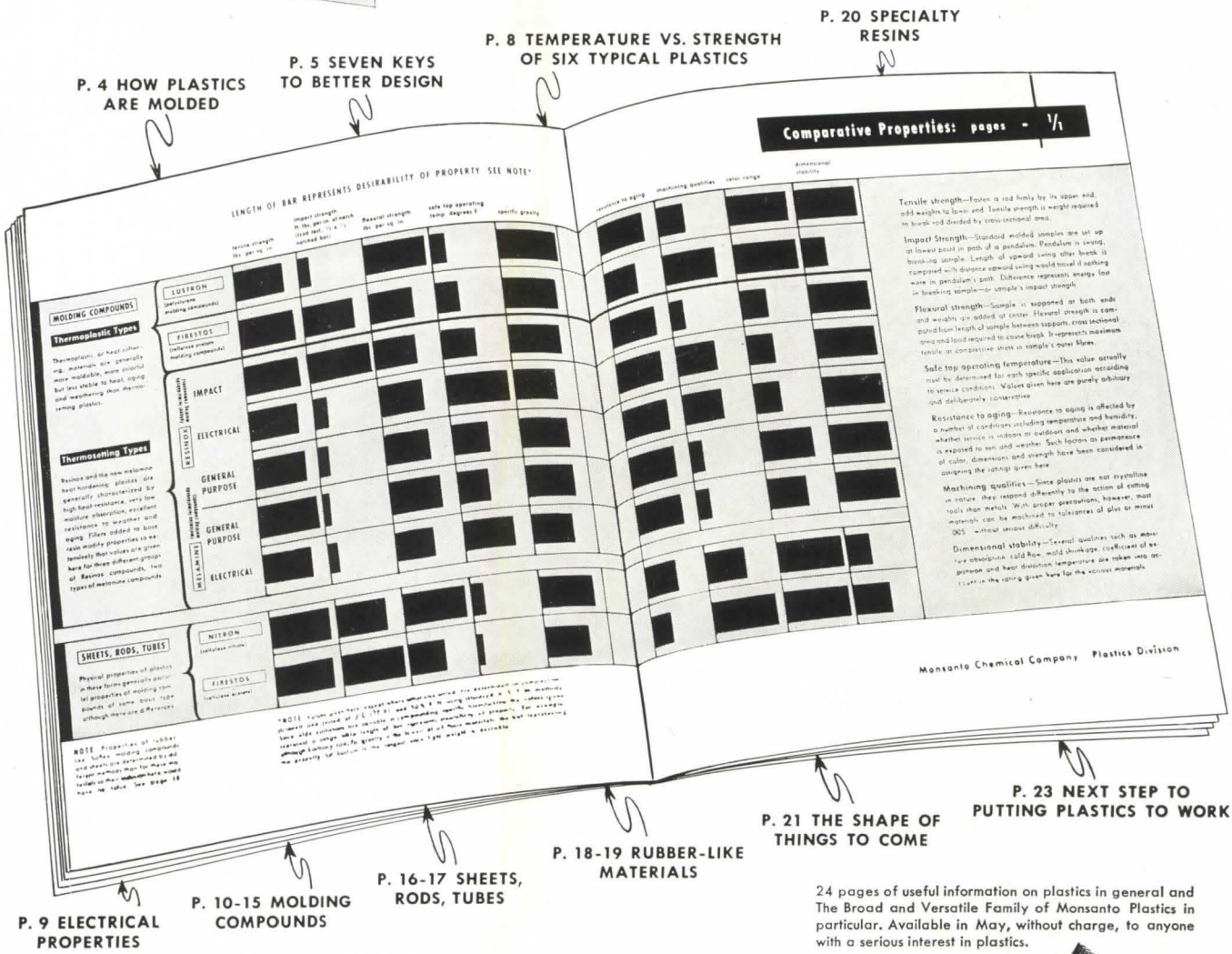
FACTS TO HELP YOU SHAPE THE FUTURE . . . RESERVE A COPY FOR MAY DELIVERY NOW!

THIS handbook should be on the desk of every engineer, designer, architect and businessman working today for victory—and planning today for a more plentiful peace tomorrow.

Yet it is essential these days that no paper or printing materials be wasted—so the booklet is being announced now, a month ahead of publication, and you are asked to reserve your copy now for delivery early in May.

In these 24 pages you will find news of many wartime advances in plastics materials and molding techniques . . . and many a useful suggestion on how these advances will affect the shape of things to come. The facts are here for the technical man—yet from these pages a complete stranger should get a clear picture of what plastics are, how they are used in industry and what they may offer him in his business or profession.

To make sure a copy is printed for you, mail the coupon below today!



24 pages of useful information on plastics in general and The Broad and Versatile Family of Monsanto Plastics in particular. Available in May, without charge, to anyone with a serious interest in plastics.

The Broad and Versatile Family of Monsanto Plastics

(Trade names designate Monsanto's exclusive formulations of these basic plastic materials)

LUSTRON (polystyrene) • SAFLEX (vinyl acetal) • NITRON (cellulose nitrate) • FIBESTOS (cellulose acetate) • OPALON (cast phenolic resin) RESINOX (phenolic compounds)

Sheets • Rods • Tubes • Molding Compounds • Castings • Vuepak Rigid Transparent Packaging Materials

MONSANTO PLASTICS

SERVING INDUSTRY...WHICH SERVES MANKIND

Monsanto Chemical Company
Indian Orchard, Massachusetts

Please print a copy of *The Family of Monsanto Plastics* for me and mail to:

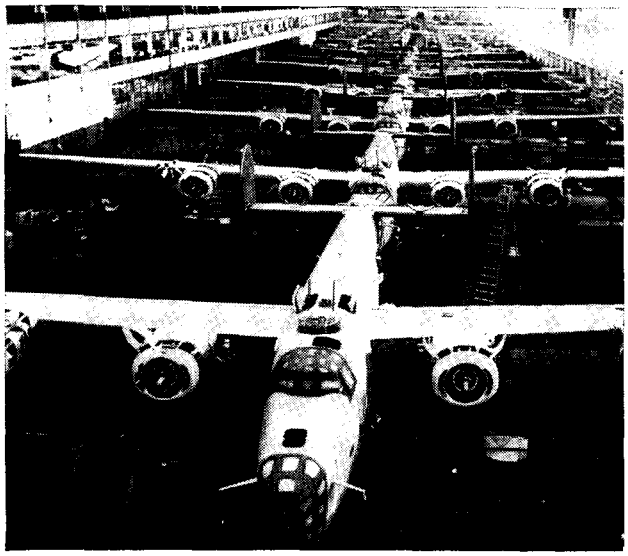
*Name*_____

*Business Firm*_____

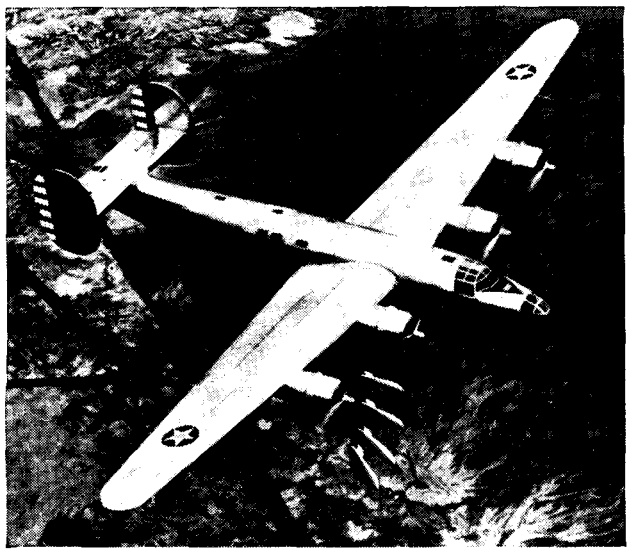
*Address*_____

*City*_____

1 This is a cornfield. Any first rate construction engineer can build a bomber factory on it—if he has time.



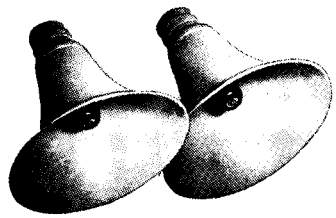
2 This is the bomber factory. Any first rate production man can assemble a bomber in it—if he has time.



3 This is the bomber. Any first rate pilot can take it over A Nazi target—if he has time. *Time* is the essence, the important dimension between cornfield and target.

TIME_

THE FOURTH DIMENSION



4 RCA Sound Equipment saves construction and production time by eliminating communication bottle necks

In war plant construction, RCA Sound Equipment has saved thousands of man hours by providing lightning communication between the shack and *every* workman *anywhere* on the job.

In war industry, RCA Sound Equipment has saved and continues to save thousands of man hours by eliminating communication bottlenecks.

That is why architects are using RCA Sound Equipment to speed up war plant construction and incorporating RCA Sound Equipment in their war plant blueprints.

In recommending RCA Sound Equipment to your clients, these important factors may be stressed.

RCA Sound Equipment enables management to: 1. Locate and communicate *instantly* with executives, key men, maintenance men and visitors anywhere in office or plant. 2. Expedite production and increase efficiency through plant-wide coordination and control. 3. Contact entire personnel for emergency announcements, air raids, fire and police alarms. 4. Provide special programs—"live", recorded, radio—during lunchtime and fatigue periods. Reports from hundreds of war industries show that such broadcasts build morale, increase efficiency, speed production.

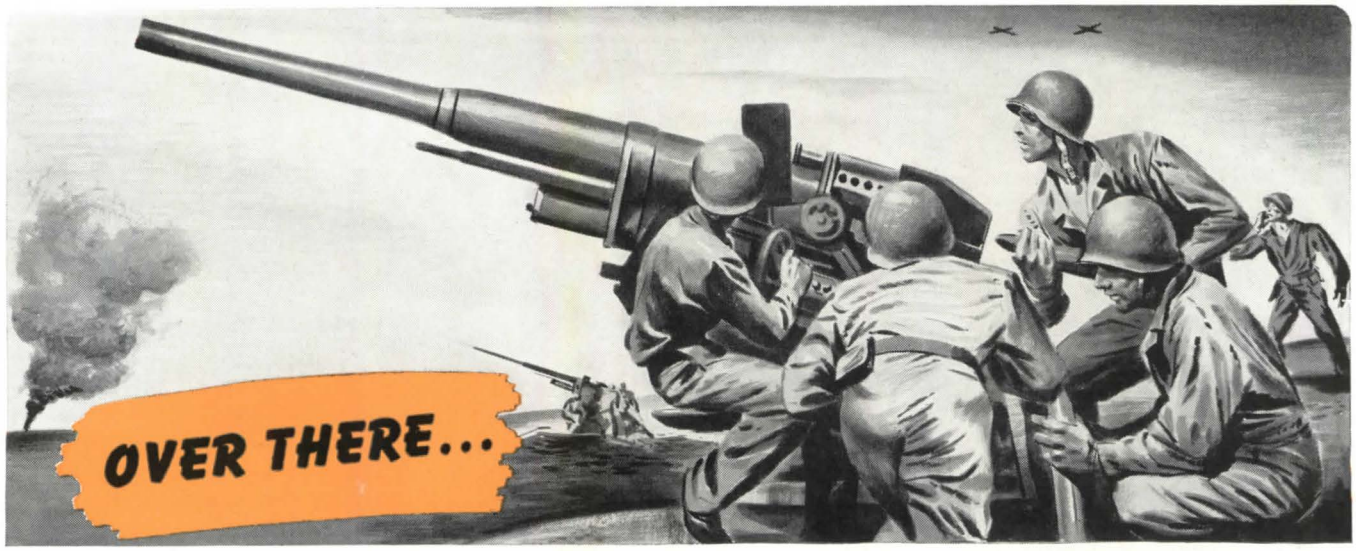
No matter how large or small the plant is, there is an RCA Sound Equipment combination that can be "tailored" to the job.

For complete details, write RCA Industrial Division, Radio Corporation of America, Camden, N. J., Dept. 2-3.

RCA

RCA SOUND AND PICTURE EQUIPMENT

RADIO CORPORATION OF AMERICA
CAMDEN, NEW JERSEY



YOU CAN DEPEND ON COPPER AND BRASS

Wherever guns are firing, wherever planes are flying—American fighting men are proving the worth of copper and brass. Finer ammunition because of it . . . better ships . . . more effective planes . . . more efficient tanks . . .

It's true of the home front, too. Copper and brass-pipe plumbing is proving its worth again and again in long-lasting rust-proof, trouble-free service. Likewise copper sheet metal work . . . bronze screens . . . wherever copper is in use.

As an architect, you can be proud of the many times you wrote "Anaconda or equal" into pre-war specifications.

With you, we are looking forward to victory and to peacetime building on a scale never before achieved in America. Anaconda Copper and Brass will be ready for your blue-prints . . . in even wider fields of application, usefulness and economical maintenance. 4320

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REQUIRED READING

By ELISABETH COIT, AIA

THE HANDBOOK OF ARCHITECTURAL PRACTICE. 4th ed. Washington, D. C. (1741 New York Ave., N.W.) Amer. Inst. of Architects, 1943. 204 pp. 8½ by 11 in. tables. $5.00.

A THOROUGH revision, directed by William Stanley Parker, F.A.I.A., to record essential changes since publication of the third edition in 1927. To the statement of the Institute's idea of the contemporary architect, his professional position, his complicated rôle of artist, constructor, business administrator, judge and client's guide, are added helps to the worthy filling of that position: A code of approved practice; notes on pitfalls and how to avoid them with regard to client, office organization and records; studies, specifications, contracts, execution of the work . . ., the whole footnoted with references to some thirty A.I.A. Documents and forms reproduced here as appendices.

While to the practicing architect collection in one place of these items is a service, it is possible that the book may do us even greater service outside of the office. We have long been exercised as to how to publicize our profession without seeming to seek personal advertisement. The architect and his work are news to the layman: possibly astonishing news. Which of us cannot get his local editor to tell his local world about us, apropos of this well-written, well-printed, entirely professional—but human—book? How many of our local library boards will judge they cannot afford it at a time of public hunger for building and planning?

BRAZIL BUILDS: Architecture New and Old, 1652-1942. By Philip L. Goodwin, F.A.I.A. New York (11 West 53rd St.) Museum of Modern Art, 1943. 208 pp. 8½ by 11 in. $5.00.

HERE ARE photographs, sketches, plans or details of some four score buildings erected throughout the United States of Brazil during four centuries. The collection, made last year by the Chairman of the A.I.A. *Committee* on Foreign Relations, in collaboration with G. E. Kidder Smith, A.I.A., who photographed notable buildings and significant landscapes, was shown at the Museum of Modern Art in January-February, and an article on the exhibit appeared in the January ARCHITECTURAL RECORD with about fifty illustrations. Outstandingly interesting among the modern buildings developed in great variety in the last dozen years are the offices of the Ministry of Education and the A.B.I. (Brazilian Press Association) in Rio de Janeiro with sunbreak systems for glass-walled sunny facades which do away with the need of artificial air cooling (see ARCHITECTURAL RECORD, Dec. 1940, pp. 73-9 and Jan. 1943 p. 49). But most of the items selected from the work of two dozen architects show originality and freshness in siting, material and design, while the older buildings, skillfully photographed in their striking settings and well described, contribute not a little to our understanding and appreciation of our Southern neighbor.

AMERICAN PLANNING AND CIVIC ANNUAL. Ed. by Harlean James. Washington, D. C. (901 Union Trust Bldg.), Amer. Planning and Civic Assoc., c. 1943. 254 pp. $3.00.

NEW PLANS FOR OLD TOWNS . . . Hartford, Vt. By John W. Reps. Boston, Mass. (2100 Federal Bldg.) National Resources Planning Board, 1942. 39 pp. 8½ by 11 in.

NEW ZEALAND EXPERIENCE . . . planning for improved housing. New York (470 Fourth Ave.), Citizens Housing Council, 1943. 20 pp. 6 by 9 in. 20 c.; in quantity 10 c.

"THE UNPREPAREDNESS of the twenties and the depression years need not be repeated," says APSC in issuing one of the most comprehensive of recent publications on after-war planning: a record of current thought contributed by about a hundred experts in economics, housing, park administration, city planning and zoning.

New Zealand's problems and projects parallel ours only in the extent of the housing shortage and the tendency toward increased Government activity in matters which private enterprise has left unsolved. The State controls education, police and many other matters for which in more populous countries local boards are responsible; the national Government levies the land tax which meets the cost of state services. State controlled houses are available for all classes without discrimination and without income tests, and "the neatest and tidiest portions of New Zealand towns are those occupied by State tenants."

The case study of Hartford, Vt., made by the Senior Fellow at Dartmouth College, has value far beyond the record of local conditions made to serve in the township's future development. For the penetrating account of historic background, the town inventory, methods for translating plan into reality within the State framework, and the heartening glimpse into the Hartford of 1950, are intentionally presented as a handbook to help other towns similarly situated in making surveys preliminary to formulating future policies and procedures. There are four maps, and a three-page outline of the scope of a town planning survey; and the annotated bibliography, limited to directly pertinent material, shows that not a little work has already been done in the field of rural planning by both public and private effort.

PLUMBING PRACTICE AND DESIGN. By Svend Plum. New York (440 Fourth Ave.) Wiley, 1943. V.1. 300 pp. 5⅞ by 9 in. illus. $4.50.

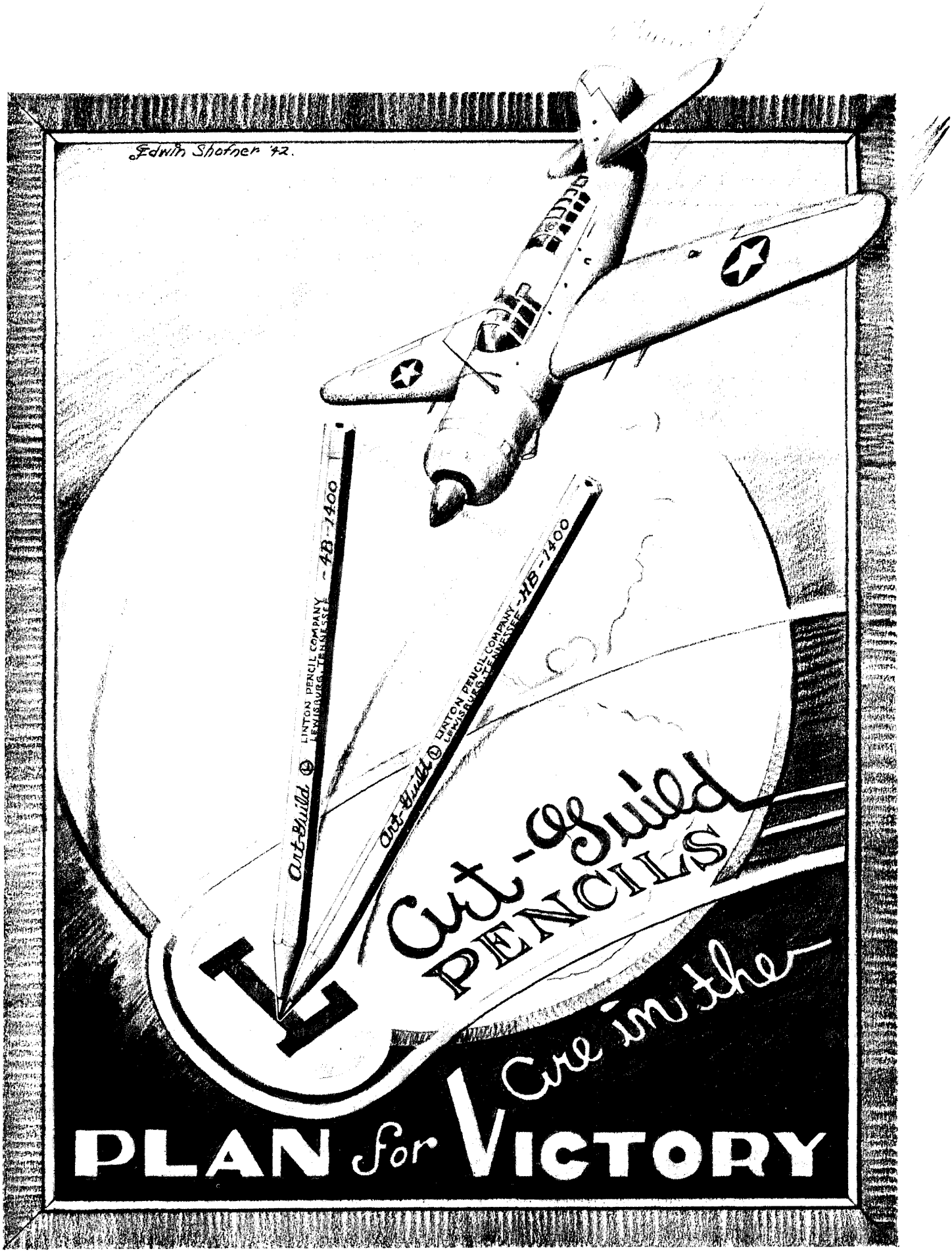
A "WHOLEHEARTED attempt" by a consulting engineer to do justice to an ancient and useful craft treated as a stepchild by architect and engineer. This volume is a consolidation, ingenious in arrangement, illustrated with 167 well captioned figures and 129 tables, with copious "definitions" grouped under each subhead and entered distinctively in the general index, bringing together accepted data in a uniform terminology, filling in missing parts, analyzing as many problems as practicable on materials, pipes and fittings, valves and controls, fixtures and accessories, pumps, fire protection and air piping equipment; while the companion volume, scheduled for June publication, will handle codes and regulations, water and gas supply, drainage, sewage, etc.

THE EVOLUTION OF BUDDHIST ARCHITECTURE IN JAPAN. By Alexander Coburn Soper, III. Princeton, N. J., Universal Press, 1942. 300 + 70 pp. 8¾ by 11¾ in. illus. $10.00. (Princeton Monographs in Art and Archaeology. 22.)

WITH 211 figures, mostly photographic, and a clear sympathetic text, the associate professor of art history at Bryn Mawr has made a beautiful and interesting book.

The work, entailing lengthy resi-

(continued on page 28)



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REQUIRED READING

By ELISABETH COIT, AIA

(continued from page 26)

dence in Japan and some time in China, was made possible by the award of research fellowships by the General Education Board and the American Council of Learned Societies.

Orientalists and other specialists may disagree with some observations and conclusions; all we seek to do here is to record the publication of a book of profit to the uninitiated, stimulating interest, explaining simply conditions and events leading to communication and interchange of thought between Chinese and Japanese, and to the later widening of the gulf between the two, with descriptions of architectural forms and practices, of details and symbols which the most superficial observer must have noticed wonderingly on innumerable occasions.

AIR CONDITIONING ANALYSIS . . . By William Goodman. New York (60 Fifth Ave.), Macmillan, 1943. 455 pp. 6¼ by 9½ in. tables, illus. $6.00.

THIS ANALYSIS by a Trane Co. engineer, author of many papers on various aspects of air conditioning, is a unified treatment of fundamentals of the science of changing the condition of the air as distinguished from the many texts available on equipment for refrigeration air handling and temperature control.

While detailed and comprehensive, the work is so arranged that many matters of concern to the advanced student and the specialist are separated from the text. Thus the mathematical derivations of all formulas appear as appendices at the end of each chapter, and the set of tables of the properties of humid air for all barometric pressures from 22 to 32 inches, which form about a third of the book, are collected at the end, leaving a manageable and pleasant—the word is used advisedly—set of statements of principles illustrated with few or many examples as required.

NEW EDITIONS

A.S.T.M. STANDARDS ON PAINT, VARNISH AND RELATED PRODUCTS. Philadelphia (260 S. Broad St.) c. 1943. 425 pp. 6 by 9 in. illus. $2.75; in quantity $1.75.

REVISION to last December of Committee D-1's continuing project, this edition includes some 120 specifications, tests and definitions.

STEEL AND TIMBER STRUCTURES. By George A. Hool and W. S. Kinne. 2nd. ed. New York (330 West 42nd St.), McGraw-Hill, 1942. 733 pp. 6 by 9 in. illus. $6.00.

STRESSES IN FRAMED STRUCTURES. 2nd ed. Same authors, publishers, format. 642 pp. $5.00.

INTRODUCTION TO REINFORCED CONCRETE DESIGN. By Hale Sutherland and Raymond C. Reese. 2nd ed. New York (440 Fourth Ave.), Wiley, 1943. 559 pp. 6 by 9 in. illus. $4.50.

FUNDAMENTAL revisions of three works standard since publication of their respective first editions: the first two in 1923 and the third in 1926.

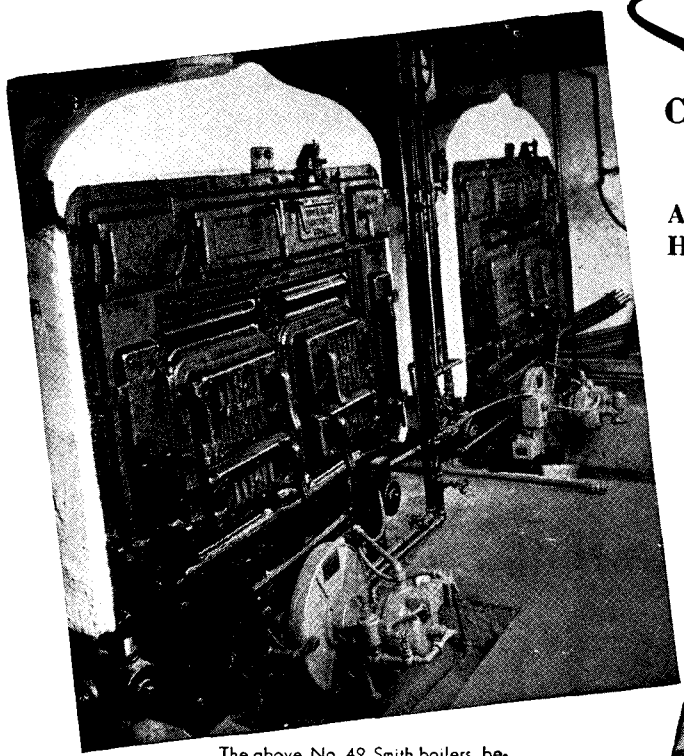
The Hool and Kinne volumes are the first two to be revised of the six forming the well known 6-volume Structural Engineers' Handbook Library now being completely revised to include current design, construction

(continued on page 30)

Why... H. B. Smith

CAST IRON - LOW PRESSURE BOILERS

ARE ANSWERING INDUSTRY'S HEATING REQUIREMENTS



The above No. 42 Smith boilers, besides handling heating requirements, supply steam at 10 lbs. pressure to a degreasing machine.

This No. 60 Smith boiler, together with another unit of equal size, not only supplies steam for heating in a Massachusetts industrial plant, but handles a large air conditioning load, as well as process steam and service hot water.

1. Designed for Continuous Operation. H. B. SMITH large boilers are *independent header* type sectional boilers. Each section is in reality an individual boiler which is connected to supply and return headers and may be disconnected without interruption of service.

2. Unusual Flexibility of Operation. The larger size H. B. SMITH boilers are of vertical water tube design. Many comparatively small vertical waterways assure rapid water circulation and fast steaming. This flexibility of operation is particularly to be desired on installations where the system itself requires flexibility of performance.

3. Adaptable to All Types of Fuels. SMITH boilers are adaptable to all types of fuels. Hand fired and automatically fired solid fuels, oil or gas may be used. Quick conversion from one fuel to another is easy.

4. Cast Iron Construction for Low Maintenance Cost. Cast iron provides for greater resistance to corrosion from water and fuels. No retubing expense. This means lowest maintenance cost . . . a fact that is securely backed by statistics and case histories.

5. Sectional Boilers Easily Enlarged for Plant Expansion. H. B. SMITH boilers are sectional boilers and may, therefore, be enlarged by adding sections to handle additional heating requirements.

6. Recognized by Engineers for High Efficiency. H. B. SMITH boilers are constructed with plenty of heating surface — a high proportion of it direct — in order that heat may be absorbed once it has been generated in the combustion chamber. This fact, together with long down draft flue travel is responsible for the high efficiency and economy of operation so characteristic of SMITH boilers.

7. Rated for 40 Years' Service. The United States Housing Authority and Federal Works Agency recognize the longevity of cast iron boilers in general by recommending their amortization over a 40-year period. Many H. B. SMITH boilers have given uninterrupted service for over 50 years.

See Sweet's "Engineering" for complete data describing H. B. SMITH industrial boilers.

THE H. B. SMITH COMPANY, INCORPORATED • WESTFIELD, MASSACHUSETTS

BOSTON NEW YORK PHILADELPHIA

REQUIRED READING

(continued from page 28)

and procedures approved by A.S.C.E., A.R.E.A., and other engineering societies.

Prof. Sutherland's book, again, as in the first edition, written in collaboration with a structural engineer, is addressed primarily to the advanced student, with emphasis on the things helping to form the practical viewpoint, and indication of association, society and other publications with which acquaintance is desirable or necessary.

CONSERVATION OF CONSTRUCTION EQUIPMENT AND FACILITIES . . . Washington, D. C. (Munsey Bldg.), General Contractors of America, 1943. 75 pp. 5 by 7½ ins. $0.50 per copy; $25. per 100.

A WELL ARRANGED comprehensive little manual on emergency treatment for tools, machinery and plants, with regard to critical materials and products. It emphasizes importance of careful housekeeping, common sense in personnel handling and many other border-line matters easily overlooked, and includes a list of manufacturers and organizations which publish good maintenance and operation instructions.

PERIODICAL LITERATURE

A PLEA FOR STANDARDIZED EQUIPMENT. By Noel Carrington. Architectural Review. Cheam, Surrey, Eng. (45 The Avenue), Feb. 1943. pp. 31-2. illus.

BEFORE the war's end the best one, or the best few, models of heating, lighting, and other equipment ought to be adopted by a small corps of selectors representing commercial, consumer and other interests, so that manufacture on the huge postwar scale required and economical merchandizing may bring to all who need it efficient equipment at reasonable cost.

RALPH ADAMS CRAM. Stained Glass, Newtonville, Mass. (37 Walden St.), Jan. 1943. pp. 103-126. port.

TRIBUTES and appreciations (editorial and five articles) including some "unpublished R.A.C." about the master "who lifted ecclesiastical architecture from comparative illiteracy to its present respectability," who was responsible for the 12½ per cent contingency fund to provide for experimentation and tests for a stained glass project, and whose work includes much journalism and a score of books.

(continued on page 32)

UNDER THE NATION'S ROOF

April, 1943

There is nothing in War Emergency restrictions or regulations to prevent specifying - and getting - the type of built-up roof your project requires and your judgment dictates. Use coal tar pitch and tarred felt with gravel or slag surfacing on flat areas and any of several sound asphalt or asbestos variations on steep or free-drainage surfaces.

There is an erroneous impression that asbestos fibers are not available for asbestos roofing materials. This is not so. All customary weights of asbestos roofing felts can readily be obtained.

The WPB standardization program as regards roofing felts simply eliminated some trimmings. The customary and time-tried weights and qualities remain.

Blisters on smooth surfaced asphalt or asbestos roofs. Ruberoid PERFORATED asbestos or asphalt felts have practically solved this problem. The tiny perforations permit the escape of blister-forming vapor during application at the same time permitting the cementing asphalt to bleed through and grip the felt firmly.

Sheet Metal Replacements. Ruberoid's new asbestos-cement board, Stonewall, replaces sheet metal for Heating and Air-Conditioning Ducts and similar construction where fire- moisture- and rust-proof material is needed. Easy to work – you can nail it, saw it, score it, drill it. No painting is required. Strong, durable, low in cost.

Good roll roofing will last for years when properly applied on steep surfaces. Seam leaks often appear early due to loosening nails. Ruberoid now equips certain grades of roll roofing with an ingenious and permanent tape device called the Eason Flap which effectually seals the nails away from the weather and keeps seams tight. Eason Flap Roofing is still available for Government jobs.

Puzzled over wall flashing design when you can't use your customary sheet metal detail? Ruberoid has 5 types of flashing without metal - all practical - all simple to install by a competent roofer.

The RUBEROID Co.

For up-to-the-minute information on your roofing and building problems consult our nearest sales office:

NEW YORK—500 Fifth Ave. • CHICAGO—307 North Michigan Ave. • BALTIMORE • ERIE • MILLIS (Boston) • MINNEAPOLIS • MOBILE

REQUIRED READING

(continued from page 30)

POST-WAR RECONSTRUCTION. National Housing and Town Planning News-Bulletin. London (41 Russell Sq., W. C. 1), Feb.-Mar. 1943, p. 2, etc.

THE GOVERNMENT has decided to ask Parliament to constitute a separate Ministry for Town and Country Planning in England and Wales. About 2¾ million houses have been damaged or destroyed, or about 1/5 of all in the country. Of these 2½ million have been repaired and are occupied; another 100,000 repaired but not occupied, leaving a loss of about 150,000. Against this loss are 135,000 started before the war and since finished.

TECALI, ZACATLAN AND THE RENACIMENTO PURISTA IN MEXICO. By John McAndrew and Manuel Toussaint. Art Bulletin, New York (625 Madison Ave.), Dec. 1942. pp. 310-325. illus.

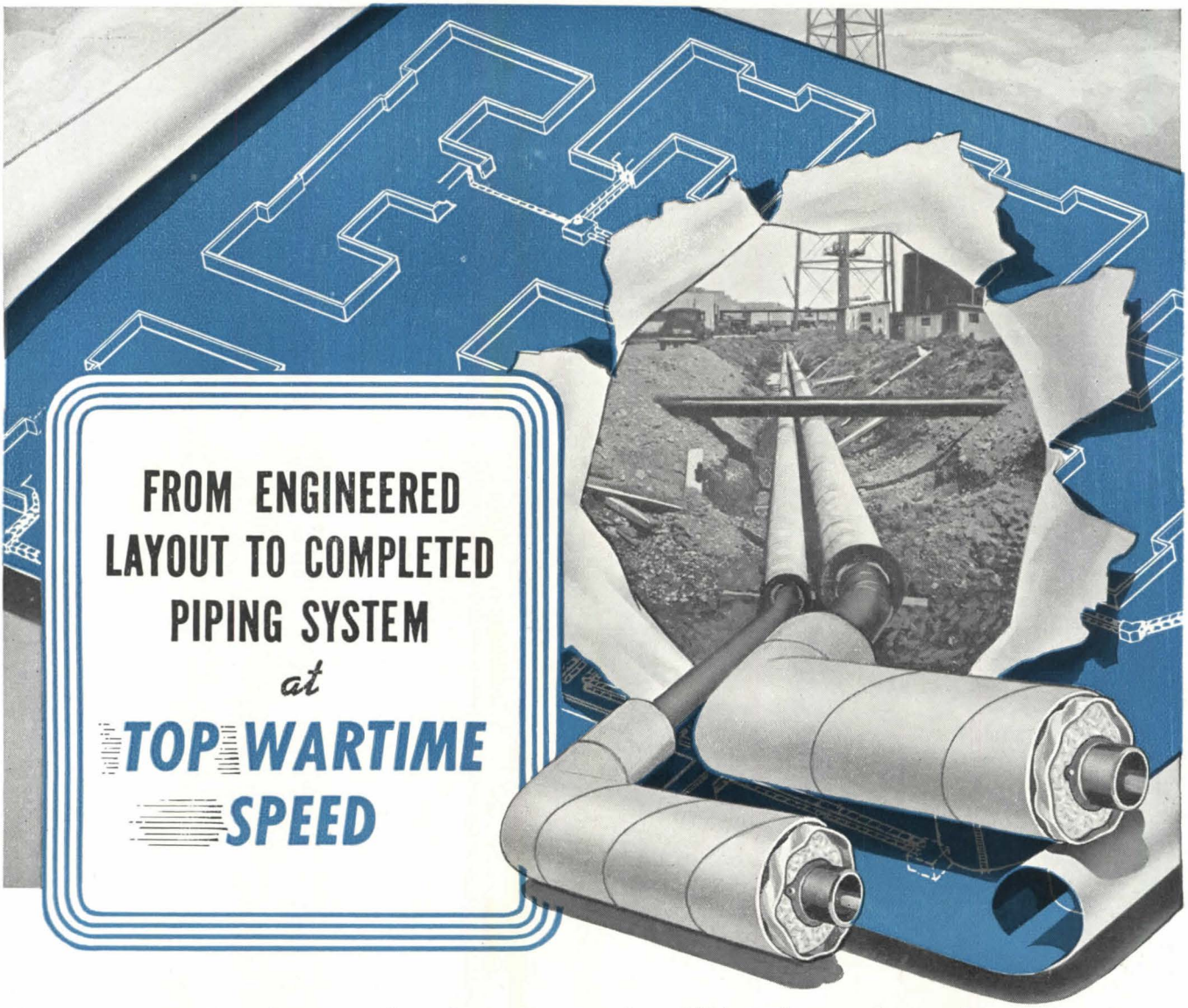
STUDY, with 37 illustrations of purist buildings and of purist details in non-classical 16th Century Mexican buildings showing a "surprising uniformity, in spite of Gothic, Mudejar, Plateresque and even wayward Romanesque . . . all subject to Indian re-interpretation," and the continuing later influence of that purism, inspired more probably by treatises on Italian architecture or by Italianate Spanish architectural books than by personal recollection of Spanish examples.

THE ARTIST IN WAR TIME. Liturgical Arts. New York (300 Madison Ave.), Feb. 1943, p. 23.

THE EDITOR pleads that "it ought to be possible for at least a limited number of our artists to continue their tasks here" if a studio but 30 miles from London is "snowed under with work, more especially altars for Catholic churches in Manchester, Liverpool and Preston, . . . if a people who have felt the full fury of the war have still a sane concern with artistic matters."

THE WALL. By Ernest K. Mundt. Art Quarterly. Detroit, Institute of Arts, v. 4, no. 4, Autumn, 1942, c. 1943. pp. 300-312. illus.

STUDY of Gothic, Baroque and contemporary concepts of how to define space, today's practice showing a "tendency to define spaces with other spaces and volumes instead of with wall surfaces . . ." with emphasis on "unadulterated honest materials like brick, stone and solid wood left rough or unfinished."



FROM ENGINEERED LAYOUT TO COMPLETED PIPING SYSTEM *at* TOP WARTIME SPEED

On projects vital to the war effort the urgent need for speed in construction points to Ric-wiL Prefabricated Pipe Units for steam, hot water, oil, hot or refrigerated process lines. • Ric-wiL Pipe Units are complete when they reach the job —pipe, insulation, protective covering. Field men couple or weld the pipe, insulate the joints and move on to the next joint. Man-hours are saved in the field and the installation is completed at a rate that can give no comfort to the Axis.

In addition, these units produce a permanent, low-maintenance system while using critical materials amounting to only 15% to 20% of their total weight . . . And they require for shipment only 20% to 25% of the space in available gondola cars that would be required for an equal footage of other types of conduit construction. • Speed is the essence of wartime construction—and Ric-wiL Prefabricated Pipe Units have proved a definite aid.

When Makeshifts Won't Do—**RIC-WIL**

Architects, Engineers and Contractors on war projects will find much helpful information in the Ric-wiL Engineering Data Book. Write . . . on your letterhead . . . for a copy.

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THE RIC-WIL COMPANY • CLEVELAND, OHIO
AGENTS IN PRINCIPAL CITIES

PIPE PUTS "*Life*" INTO THE PENTAGON
WORLD'S LARGEST OFFICE BUILDING

EVEN a super-colossal building like the War Department's Pentagon is so much stone and steel until its services bring it to life. When a building for 40,000 people is put up, it takes a fantastic network of water pipe, steam lines, air conditioning lines and other piping to make life comfortable under blazing summer sun and winter cold.

Many innovations were introduced into the construction of this building but when it came to piping, no chances were taken with substitutes of any kind. Time-proved, long-lasting steel pipe that architects and engineers have found so dependable in thousands of important buildings throughout the nation was used here in large quantities.

War made it imperative to finish the Pentagon in a hurry. The time allotted was one year—or as close to that as possible. Such construction speed made the easy workability and fast welding properties of NATIONAL Pipe a real asset. Actually the building was 90% completed in 15 months.

In addition to building programs, large quantities of NATIONAL Pipe and Tubes are being used in other types of war services. Hundreds of ships are being built which need thousands of miles of pipe. Great numbers of airplanes, tanks, trucks, gun mounts and much other military equipment all need pipe and tubing. And now the biggest oil line in the world is taking 1117 miles of huge 24-inch NATIONAL Seamless Pipe to deliver Texas oil to the east coast.

PENTAGON BUILDING—*New home of the War Department—is the largest office building in the world. Has more than 4,000,000 sq. ft. of floor space.*

Big things are done in war times but when peace comes again, NATIONAL Pipe and Tubes will play an equally important part in building a better world of the future.

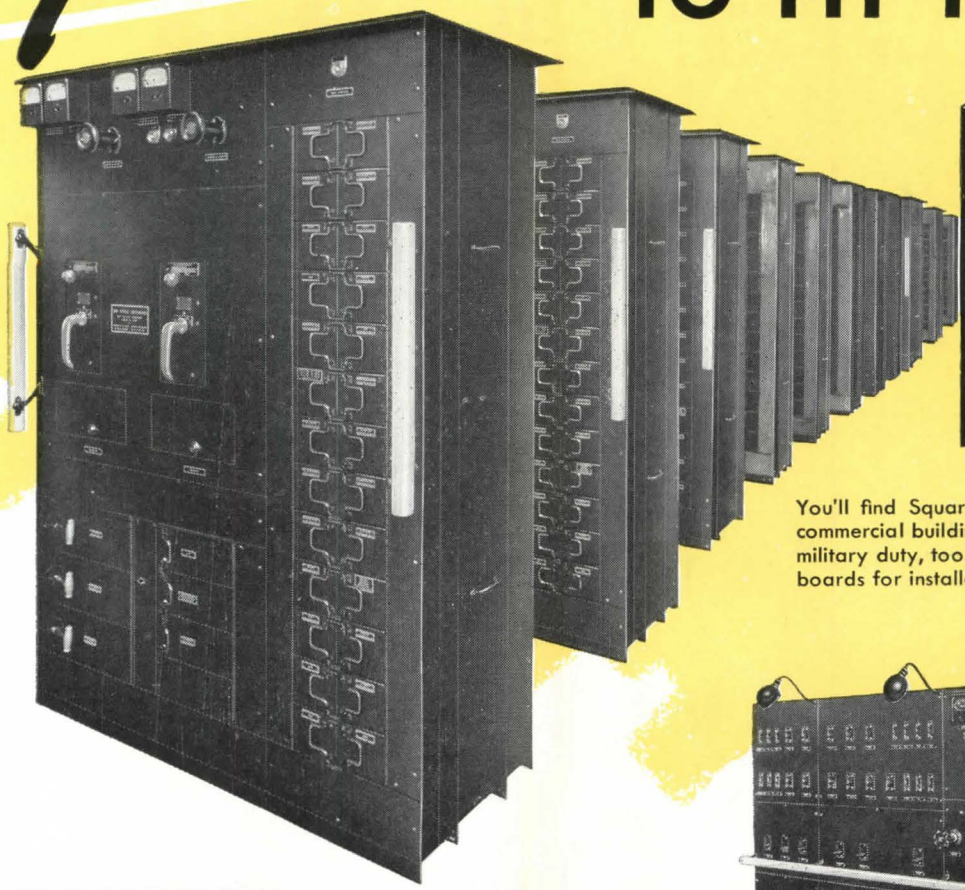
NATIONAL TUBE COMPANY

PITTSBURGH, PA.

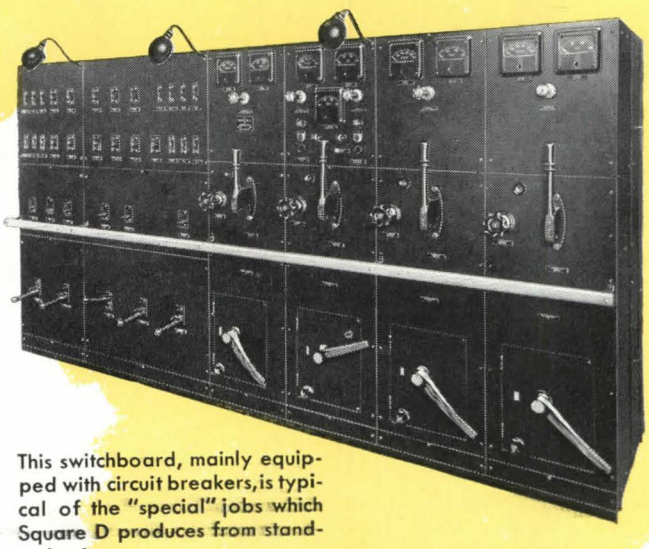
Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Export Company, New York

UNITED STATES STEEL

Tailored TO FIT THE JOB



You'll find Square D switchboards everywhere—in commercial buildings, industrial plants, and on active military duty, too. At left, a line-up of "tailor-made" boards for installation on small Army transport ships.



This switchboard, mainly equipped with circuit breakers, is typical of the "special" jobs which Square D produces from standard units.

SQUARE D SWITCHBOARDS

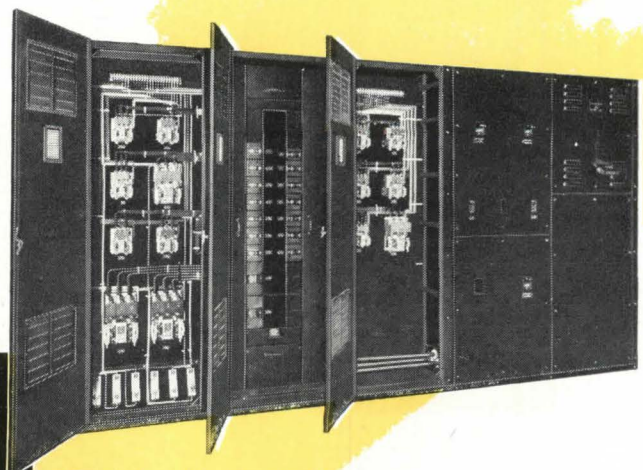
FOR COMMERCIAL AND INDUSTRIAL BUILDINGS

There is more than good workmanship involved in building switchboards. It takes a sound analysis of requirements by an engineer who knows his stuff, technically. (That's the Square D Field Engineer.) And it takes seasoned design engineers who chart the course for the men who build them. (Years of experience have taught Square D designers the angles which really count.)

CALL IN A SQUARE D FIELD ENGINEER

You're welcome to the counsel of a Square D Field Engineer in tackling any problem which involves electrical control or distribution. He is in constant contact with plants of every kind and size. He studies methods and applications with the idea of simplifying new jobs or doing old ones better.

There are Square D Field Engineering offices in 52 principal United States and Canadian cities.



Special combination circuit breaker and motor control switchboard, with ten panels. Panels are arranged back-to-back to conserve space.

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KOLLSMAN INSTRUMENT DIVISION, ELMHURST, NEW YORK

IN CANADA: SQUARE D COMPANY CANADA LIMITED, TORONTO, ONTARIO

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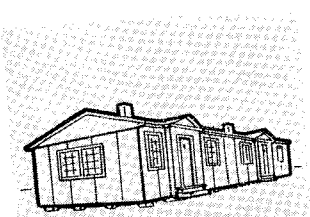
THESE amazing new boards replace scarce lumber for outside walls, roof decks and interior partitions . . . and do a sturdy permanent job!

Millions of feet of Gold Bond Gypsum Roof Plank, Exterior Board and Solid Partition Panels are already in service in dozens of army camps, storage depots and other big government projects. Now they're being specified by the mile for low-cost housing and war plants.

Gold Bond Exterior Board completes outside walls in one swift operation, serving as both sheathing and siding. Gold Bond Roof Plank replaces most of the lumber for either flat or pitched roofs, and provides a perfect base for the roofing material. Gold Bond Solid Partition Panels build permanent or demountable partitions in factories, offices and homes. Write today for complete technical information.



STURDY

PERMANENT

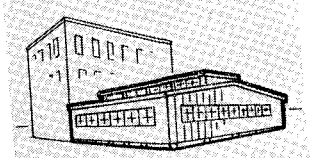
NO

SPECIAL

SKILLS

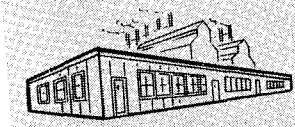
REPLACE

LUMBER

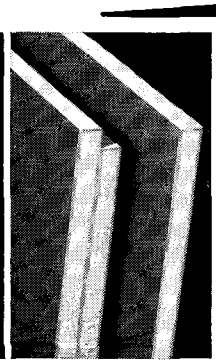


OBTAINABLE

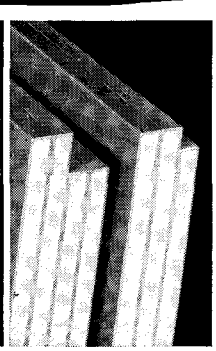
NOW



Exterior Boards—Large panels—½" and 1" thick. This style with asphalt roofing on weather side.



Exterior Boards—Same specifications as to left. This style with tough fibre on weather side.



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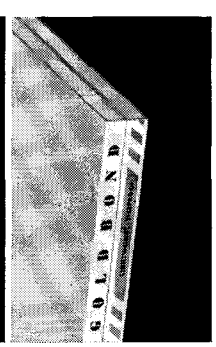

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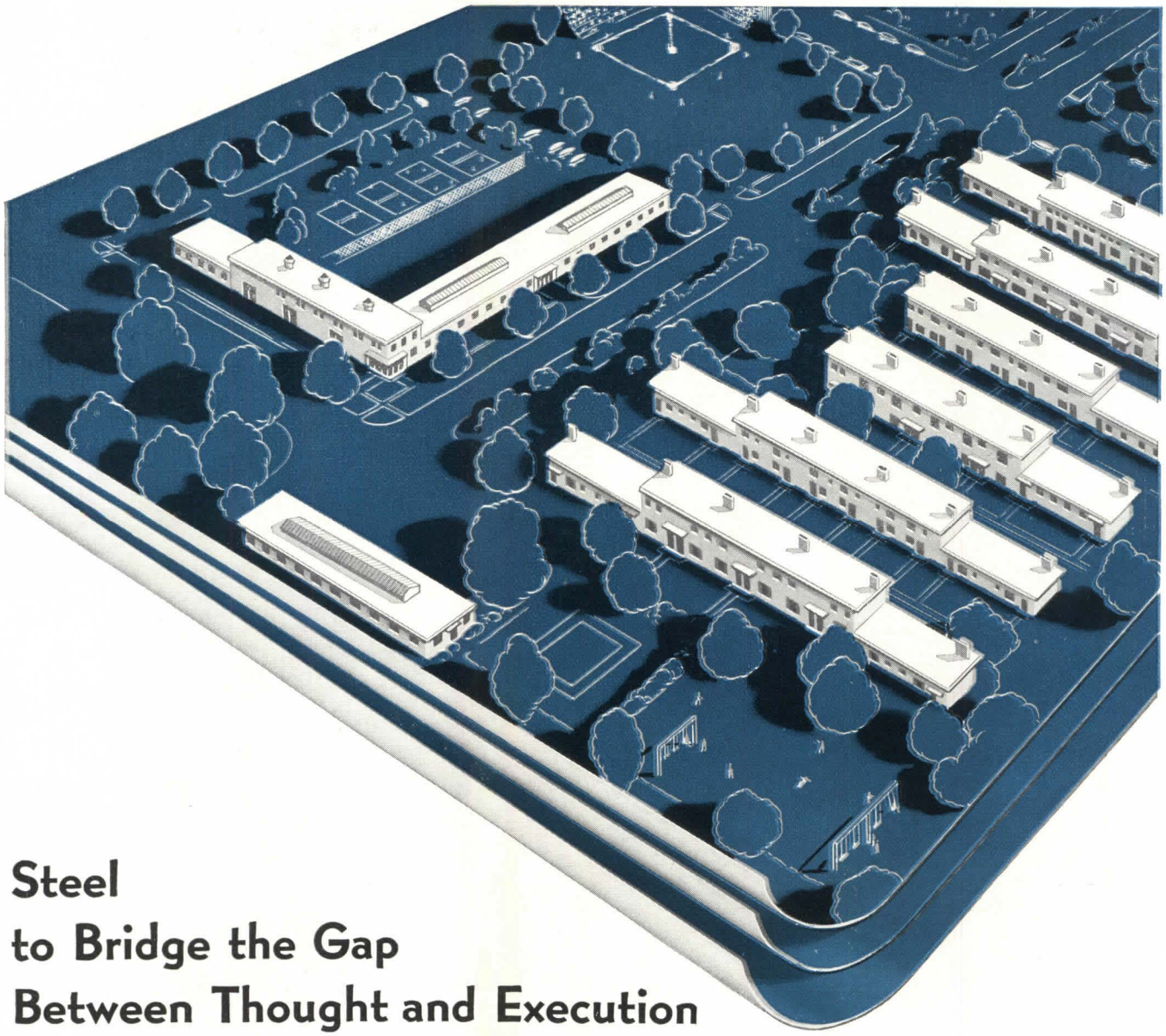

Steel to Bridge the Gap Between Thought and Execution

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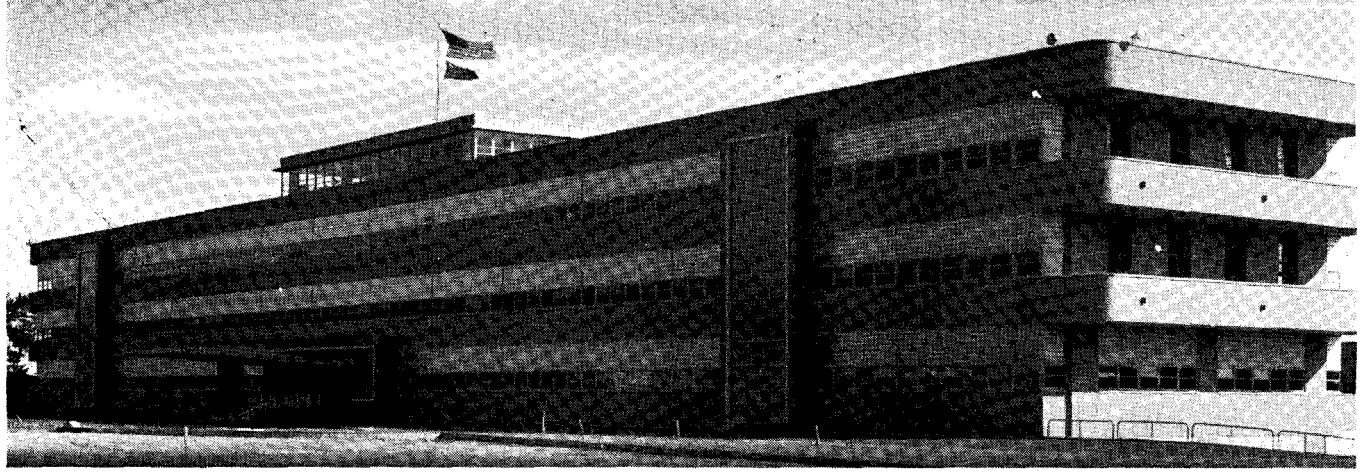
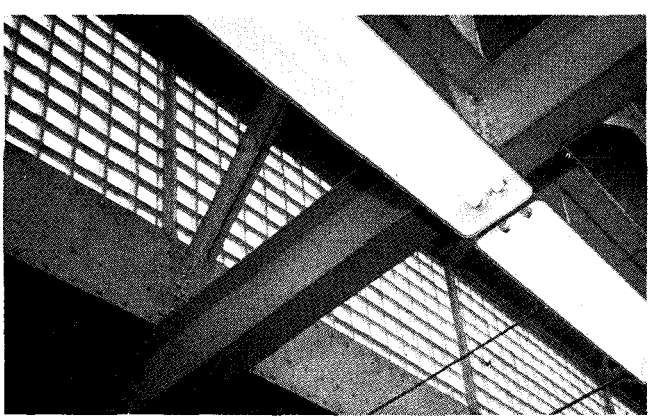
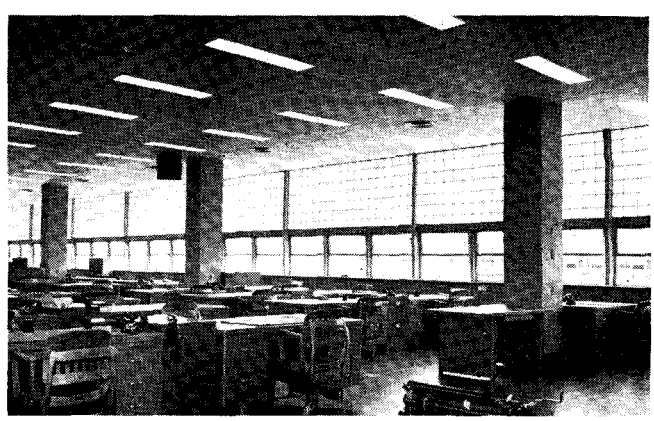


This INSULUX Glass Block monitor is typical of the system used for daylighting the manufacturing area, part of which is air-conditioned. Number of block used is restricted—but we can say that this is the largest glass block job ever built.

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

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





NEW FINDINGS

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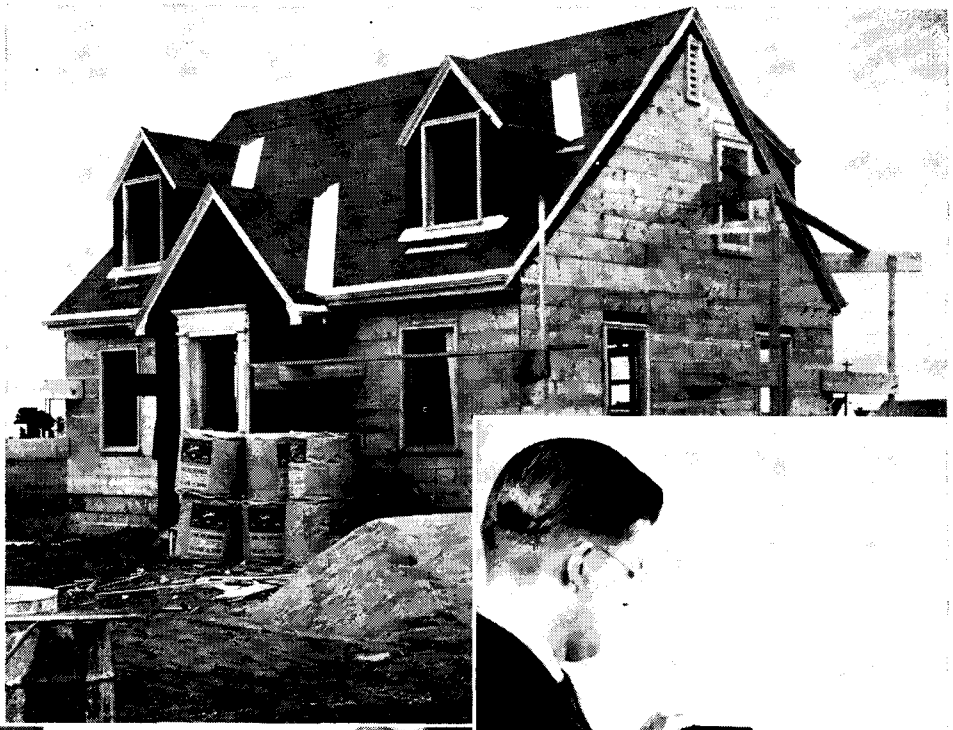
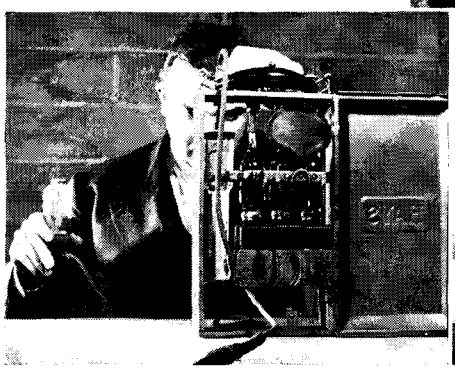
- ***Facts about attic and basement temperatures***
- ***How does insulation affect inside temperatures?***
- ***And many other important insulation questions***



Framing up one of the Test Houses— Balsam-Wool on the Job.



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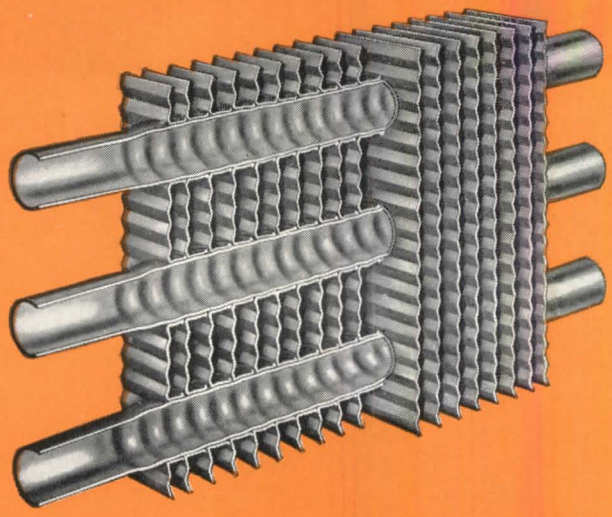

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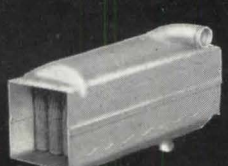
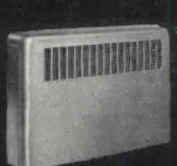
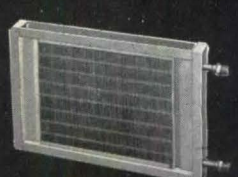


AIRCRAFT HEATING ASSEMBLY

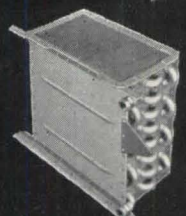


CONVECTOR RADIATOR

CANTONMENT HEATING UNIT

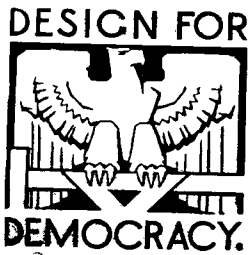


VENTILATION HEATERS NAVY TYPE



AIRCRAFT HEATING SECTION

PERSONAL POSTWAR PLANNING



THE individual architect or engineer is doing his own postwar planning now, watching the trends, keeping informed of change and improvement, analyzing his problem in relation to the overall pattern of postwar thinking. He is planning to take his part in the building program which must evolve to meet pent up demands and new conditions.

◆ The questions of how, with whom, for whom and under what terms he will work are uppermost in his mind. Who will be his clients, large or small, where will he find them, what will they want, demand, be able to pay for? With whom will they want to deal? With whom should or must he collaborate to render the greatest service? And on what basis? How will future "clients" want him to serve them, what business relationship will be most efficient, what will his relationships be with the other factors in building? How much integration in the building industry will be possible without loss of that flexibility and adaptability that have made possible the immense building feats of the war effort—and those which preceded it?

◆ The answers to these questions will be determined by experiment, by trial and error, by initiative and bold enterprise. The public (both public and private) will need buildings and they will want to be served in as simple and straightforward a way as possible. From the public's point of view a single transaction is preferable to a complex and involved series of dealings with many factors. They would like to "buy a building" either after or before it is erected, from a responsible party at a known-in-advance price or a guaranteed maximum figure. They acquire about everything else that way, but building has been a complicated, tortuous, involved process.

◆ It would certainly seem that all the design or creative factors should be combined so that the owner can deal with one organization *capable of and responsible* for the design of a building or group of buildings to meet determined needs at a predetermined cost. Whether or not this same group should include in its organization those responsible for the actual construction is a moot question. Such "all-function" organizations have been operating, many will. Time and experience alone will tell what kind or kinds of organizations will function most effectively and most economically.

◆ The place of the architect and engineer in these building organizations should not be a cause for anxiety if he has his mind on the main objective—and down deep I believe most architects and engineers have. The main objective is "to be of ever-increasing service to society" by creating better environments, better buildings. And the greatest personal compensation of the professional man is in meeting the planning, designing and building problems and having the satisfaction of solving them—doing the job and saying to oneself "well done." The architect's part in building will always be of prime importance—the analysis of the problem, the crystalization of the creative solution, the coordination of the efforts of others—seeing the job through.

◆ In the postwar period there undoubtedly will be many experiments in organization ranging from the old separation of all functions as separate business entities to the almost complete single-firm-integration of all functions, on a par with the great manufacturing, selling, financing and servicing organizations of the automotive field.

◆ If the collaboration of smaller independent units—professional, financial, contracting as in the past, is the answer to the best service—then such a system will emerge again, for the result is more important than the means. The proof of the pudding is in the eating. Large organizations may tend to become inflexible, cumbersome, bureaucratic, overburdened by overhead. Or they may prove to provide the best of all possible means for building new communities on a scale undreamed of in the prewar era.

◆ All kinds will be created, tried, and will compete. The survival of the fittest will be the rule. But since the professional architect and engineer is a free agent as well as a prime vital factor in building he can adapt his methods, techniques and affiliations according to the needs of the day and the trend of the times. He can if he will—if he will keep an open mind, maintain a flexible, adjustable disposition and not make too heavy an investment in personal pride, in protection of professional prerogatives or in petty prejudices. In these lies danger—opportunity lies in planning now for greater service.

Kenneth K. Stowell

EDITOR-IN-CHIEF

BRITAIN'S PLANS ARE BOLD

PART II, in which the architect's plans, policies, and public relations are constructively summarized by

DOUGLAS HASKELL

Britain, under stress, has created a planning ministry with positive powers. Now every major area of the earth is under positive planning, leaving the United States free to decide whether to plan or whether to try to continue in chaos, "like a bit of the Balkans."

BRITAIN now has a Ministry of Town and Country Planning with positive jurisdiction. The United States now stand alone among the major powers with no central planning agency exercising positive powers.

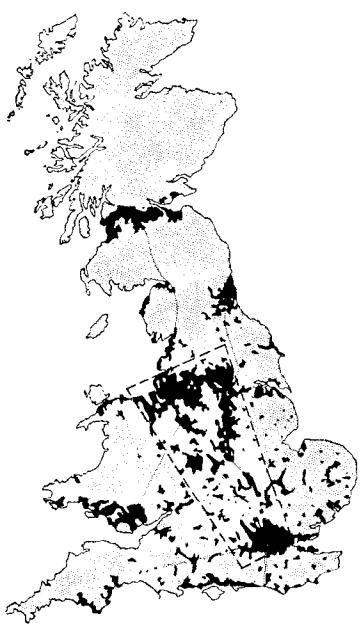
Britain, as has been said, will be replanned because she has to be. "When the bombs began to fall," says the admirable booklet on *Rebuilding Britain,* issued by the Royal Institute of British Architects, "our towns began to shrink. Congested areas were transformed into open spaces, gaps appeared everywhere, whole quarters became derelict. . . . It is estimated that one out of every five buildings in Britain has been damaged in some way, and millions of new homes will have to be provided. Rebuilding is inevitable; it is not a dream."

Britain's example is highly important to the United States, where bombs have not yet thrown past errors so plainly into view. There have been secure nations that have died on their feet; they never knew what *didn't* hit them. The United States, despite its Congress, will not be one of these. After the war it will be perfectly apparent that the rest of the world is being carefully planned. The European Continent not only is torn apart and will be replanned but, in important respects, *has been replanned.* The entire network of railroads, highways, airports, communications, customs, the electric grid, and every other productive facility, has been reorganized ignoring the old national boundaries. When all this is taken over from the Nazis, it will be changed, but reversion to the old disintegrated chaos is unthinkable. So Britain will be planned, Russia will be planned, the European Continent planned, and America will scarcely be able to survive without an effective national planning agency; it cannot remain as unorganized as a bit of the Balkans.

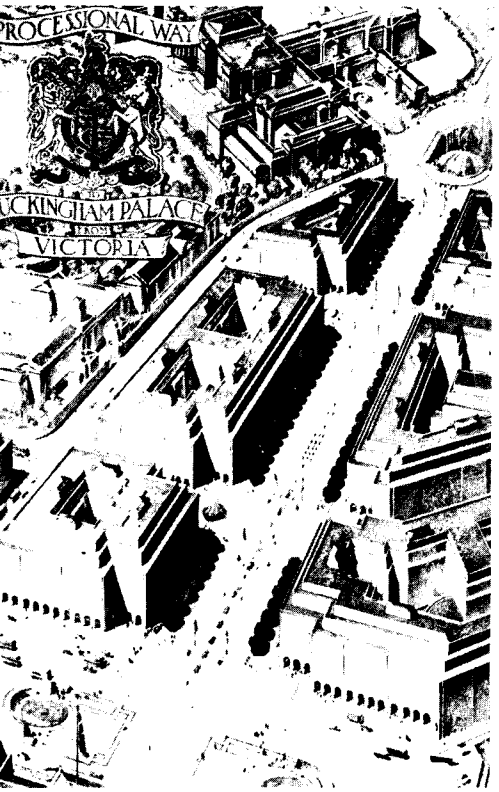
Britain's new ministry was formed in February 1943. There has been some criticism of its limited powers. The limitations are not fatal because they can be removed when the time comes for action. Too detailed organization too far ahead can be, as Frederick Ackerman has pointed out, a positive disadvantage. More important is the fact that the Ministry enjoys a rapidly growing tradition and predisposition toward national planning. At no time since October 1940 has national planning been unrepresented on the British Cabinet. Ever since then work has steadily progressed, laying a broad foundation of planning policy.

In the last month's article were summarized the recommendations of the Big Three Parliamentary Reports by the successive committees headed by Barlow, Scott, and Uthwatt. Briefly, these laid the basis for:

1. a National Planning Authority with positive powers,
2. having control over rebuilding and replanning,
3. involving industrial redistribution correlated with planning for agriculture, hence treating town and country together,
4. with complete control over all land use through the instruments of compensation and betterment.



Britain's industrial areas shown in black, white area indicating main industrial core



British Official Photo

A portion of the Royal Academy plan for the reconstruction of central London, showing Processional Way from Victoria Station to Buckingham Palace; drawn up by Sir Edwin Lutyens

Britain's architects are already at work on planning, starting with the holes and gaps in the cities. By proper management of priorities and war damage insurance, these devastations are converted into a positive planning asset.

II The New City Plans

We now come to the part played in more detail by architects. This has involved town and country plans laid down in keeping with the new broad policy; work toward new national building standards; work toward the transformation of the antiquated building industry into an instrument of modern production.

City rebuilding quite naturally proceeds with reference to the gaps and holes. These have been transformed, however, into a planning asset. Already the war has given planners two potent instruments of control, most effective where there are holes and gaps. One is the use of war damage insurance. The other is the use of licensing.

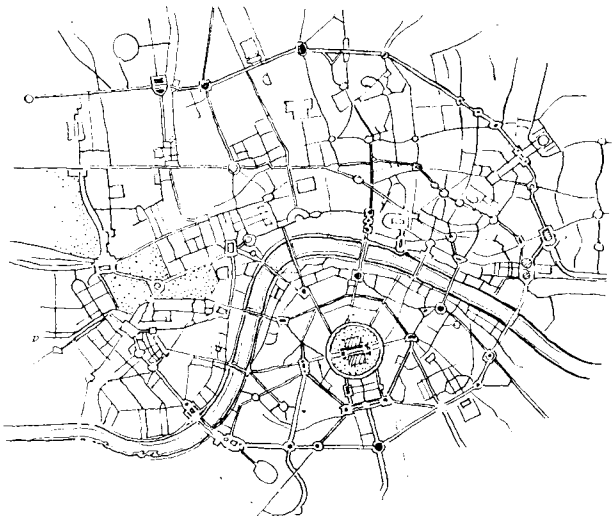
The War Damage Commissioners do not themselves inaugurate planning. Nevertheless it is stipulated, in the Act (April, 1941) that created them, that insurance is to be paid only for rebuilding in conformity with the public interest. This means that wherever plans are on hand, rebuilding must conform. Local authorities need only publish their intention of treating an area as a devastated area subject to replanning in order to assure that conformity will be required. No such free gift has come into planners' hands since the old fortress rings were replanned on the Continent as parks and greenbelts after World War I.

The other instrument is that of licensing. Licensing is an illustration of the manner in which the war transforms ineffectual negative powers into effective positive ones. In mere zoning procedure the presumption is that any sort of building may be carried out unless specifically forbidden. Under licensing procedure no sort of building may be done unless specifically permitted. Under war conditions, permission to build requires not only allocation of materials and labor but a license from the Ministry of Works and Planning. The Reconstruction Committee of the RIBA (of which, more later) suggests that this control be continued into peace time, as a continuing instrument of orderly long-range planning.

No matter what their trend, the British city plans for rebuilding start quite uniformly with traffic. The holes in the city make possible a new handling of thoroughfares. The manner in which this is done shows enormous divergence. At one extreme stands the Royal Academy Plan for London, under Sir Edwin Lutyens. It may have to be written off as the product of a fine mind no longer flexible. At the other extreme stands the MARS plan, based on principles well ahead of what the public yet understands. (It is indicative of the forward-looking temper of the profession as a whole that the RIBA booklet, written for public consumption, expounds the most advanced principles, not the retarded ones.) In between stand such routine plans as Liverpool's, and currently advanced plans such as Coventry's.

The Royal Academy Plan is the old traffic-corridor scheme, with avenues going axially, where possible, *down the center of things;* and the climaxes are mirror-symmetrical vistas à la Haussmann. This type was first devised for lords and ladies in their carriages as the center of the show. It is trebly obsolete, because it is unsuited to high-velocity modern traffic, because it creates small, lightless, airless, closed courts that would perfectly tamp any bomb and assure maximum destruction, and because architects have done it so long that now everybody thinks he can do it for himself, getting an architect merely to "fix up the elevations." It deprives architects of their *mystique* no less than it deprives the town of the architect's three-dimensional imagination.

The Coventry plan is not so much a city plan as an enlarged community-center plan. It leaves out industry, dealing only with a civic center, religious center, shopping center, market area, theater group, and cultural center. This Coventry plan is the brilliant product of the city architect,



Left, sketch plan of proposed Royal Academy plan for reconstruction of central London, as prepared under the direction of Sir Edwin Lutyens and incorporating the traffic plan of Sir Charles Bressey. The plan combines modern and ancient ideas, produces monumental corridors.

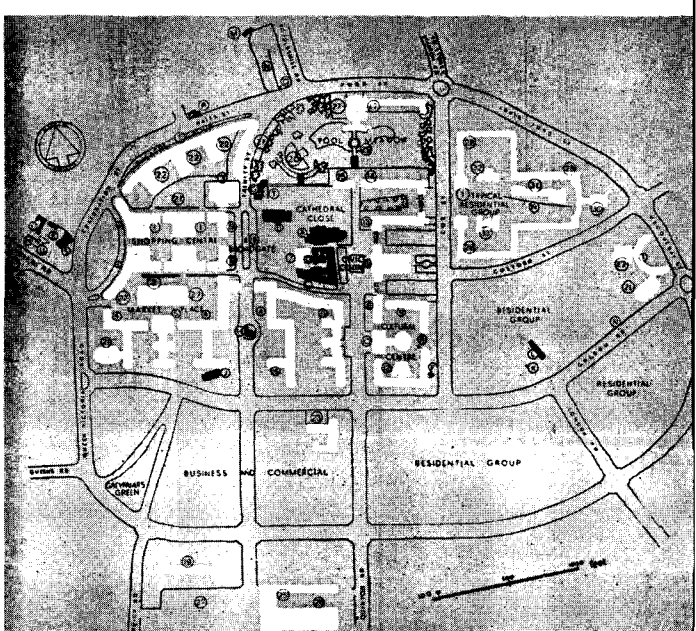
Opposite page, a purely elementary diagrammatic presentation of the "linear principle of expansion" proposed by MARS. Upper block, work and housing are separated, lie both sides of main axis of communication, can expand in length. Center block, linear principle applied to London. Industry, business and historic center along main axis, two housing areas outside it. Lower block, modified plan splitting housing areas into districts with green belts between but connected to work area and main axis. Larger diagram, elementary diagram of linear principle applied to London. Existing historic areas shown in black, industrial areas along London-Liverpool axis East and West, other industrial area to Northeast. Expansion to be East and West, housing not to straggle further North or South. *Rebuilding Britain, RIBA*

Arterial traffic has set the framework of city replanning. Obsolete planning runs traffic "down the center of things"; up-to-date methods guide this high-velocity stream "not through things but between them." Coventry does this on a community - center scale, using superblocks, outdoing the academicians in their own department of vistas. See plan below.

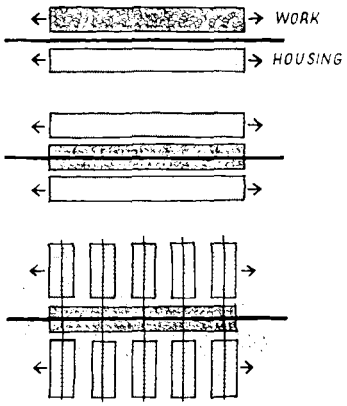
D. E. E. Gibson, and his staff, and could never have been successfully essayed by any but architects. It carries the principle of the superblock from the residential area (where housing architects have already made it customary) to the downtown area, where the most striking precedent hitherto has been furnished by Rockefeller Center. Arterial traffic passes *not through things but between them,* i.e., it flows between the various superblock areas, within which people naturally get around by walking. Apart from its functionally greater convenience, the Coventry plan outshines the academicians on their own chosen ground, supplying precisely those balanced vistas of which academicians are most proud but in far wider variety, liveliness, and subtlety, mirroring cultural growth.

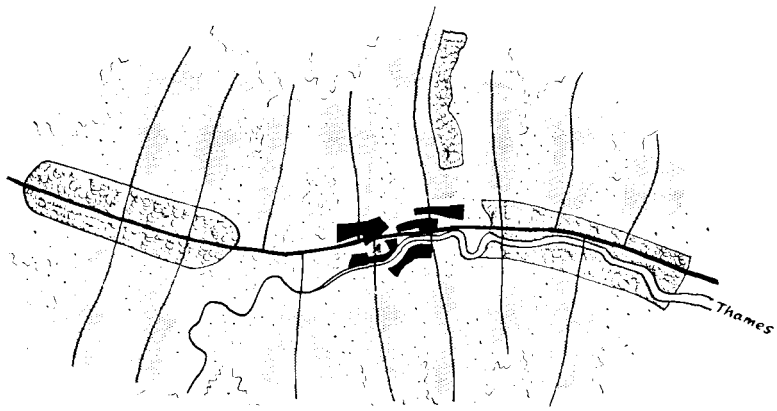
Both the MARS plan for London and the sketch plan shown by the RIBA in its booklet use the same separation of through traffic that Coventry does but for a larger purpose and with slightly different pattern. These are plans for a huge metropolis and they take in industry. Both are chiefly diagrammatic in nature, and illustrate principles adduced by LeCorbusier in his *Ville Radieuse* of 1933 and carried out to some degree in new cities

British Combine



Plan for the new Coventry.





Royal Institute of British Architects and The Modern Architectural Research Society diagrams for London expand the super-block idea to include industry, keep homes close to work, and permit free city expansion. The "linear principle" results in a series of belts, making the metropolis a union of community centers, letting open country infilter the metropolis.

such as Stalingrad. Both aim to keep homes close to work and to permit the city's free expansion. This is done on the "linear principle" by arranging industry and housing as parallel belts separated by a greenbelt which, incidentally, contains the traffic arteries. There are refinements too numerous to be covered in a general review. They look toward the breakup of the amorphous metropolis into community centers of a size functionally related to such services as schools. The important thing is not the diagram but the principles: "clear separation between different parts of the town that have different functions; clear separation between different kinds of traffic; safe and pleasant walks for pedestrians; the avoidance of the corridor street; easy access to the surrounding country; the infiltration, right into the heart of the city, of continuous parks and open spaces; and, where it is appropriate, the use of skyscrapers . . . with fine open spaces around their feet." Moreover, there is optimism about securing such radical results: "Physically it is perfectly possible; it is estimated that the London building industry, at its prewar level of size and efficiency, and with prewar building methods, could complete the whole task of demolition and rebuilding in twenty years. With more rational building methods the job could be done more easily." It is emphasized that in a city such as London only a very small core of historical buildings at the center is permanent at best, so that an astonishing degree of planned rebuilding may be had in the place of chaos at the mere price of thought and proper guidance.

There is much reason to believe that the basic principles which Le Corbusier and MARS and the RIBA were able to set forth so graphically through their linear diagrams may actually be carried out more often in the form of spider webs. Radials and rings make up the swiftest combination of thoroughfares, and the most economical. They may be used as mere Renaissance surgery, in the grandiose manner of Haussmann, as was done in Berlin. Or a new ring through a central devastated area may serve the limited objective of linking up three previously disconnected railroad stations, doing away with an "el," releasing the waterfront for local traffic, and leading out-of-town visitors around the quiet civic center, as is proposed at Liverpool. Or again, it can be used to organize living and work, communal enjoyment and movement, education and escape into Nature, in a comprehensive long-range scheme of development on the basis of full human dignity.

Meanwhile, so far as London itself is concerned, the real news will be available only when the plans are released that are being prepared by Professor Patrick Abercrombie and his assistants at the behest of the Ministry of Planning, for the London County Council.

III City, Country, Transport

From cities planning leads into the country. Long-term rural plans are lacking but life is growing around the new war community centers. Through these hostels and their community organization, architecture is catching up with modern life.

Dispersion, as we have seen, is the keynote of British planning on the national scale. In terms of people, eight-tenths of prewar Britain lived in towns, and half of it in the great conurbations centering on London, Birmingham, Liverpool, Manchester, Glasgow. In terms of land, however, eight-ninths of the country is still devoted to agriculture!

Nothing definite has been released yet in the nature of postwar schemes for dispersal planning in the country or the smaller communities. All-important airports, for example, are secret. We do know something, however, about evolving trends.

Small-town compactness, for example, is being advocated to save precious agricultural land, and there may be fewer 12-family-to-the-acre garden cities and more tall apartments.

Rural and small-town social centers are advocated on the model of the recent "village colleges" which are strikingly similar to the community centers built by our own FSA. When the war ends, it will be discovered that many a nucleus is already on hand. This is because of munitions works, already located away from towns, and their associated hostels, the fore-runners of our own "duration dormitories."

These hostels seem to be an example of architecture, in an emergency, catching up to life. For example, they provide for single roomers, hitherto almost a separate nation of duckers-into-leftover-holes-and-corners. It has been necessary to provide for community life and recreation in an integrated way. The hostels involve air raid shelters, movies, large concert halls and movies, shops and restaurants.

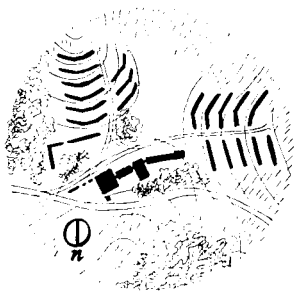
As designed by Professor William Holford and his assistants, the hostels with their community centers are the most interesting architecture of the war. They have a charming variety and contrast, of the impermanent against the permanent, large against small, the rounded or barrel-vault shapes of the Nissen hut and its derivatives played against the rectangular brick forms of traditional building methods, with the regularity of standardized repetitious elements in irregular functional disposition amidst surroundings of open country.

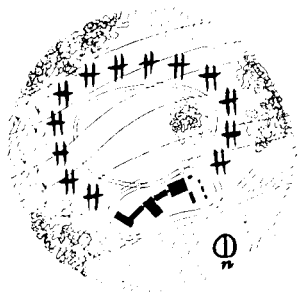
These hostels, and other institutions such as the British restaurants, have positively emancipated drab industrial living. The restaurants have been an especial boon in a country where wives have been obliged to cook a solid noon meal instead of sending off their husbands with a thermos bottle and a box lunch. In the new communities the general sense of liberation is expressed (as it is also expressed in the new American rural communities) by color, gay murals, and the budding of all sorts of amateur clubs pounding the boards with lusty dance and drama.

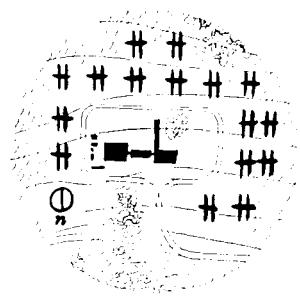
Town, country, and transport have indeed been reconsidered so freshly in Britain that the critic J. M. Richards has evolved a whole allegory, giving especial insight and sympathy to that traveler hither and yon upon highways, planes, and by-ways that our own planners are so especially ready to despise as "rootless." On the economic analogy, the author speaks of the typical "production man," the "consumption man," and the emergent factor, the "distribution man."

Mr. Richards has, however, apparently not heard of the traveler in his largest numbers, the traveler en masse—as hard up in the prison factories of Germany as he is on the Western plains—the migratory worker.

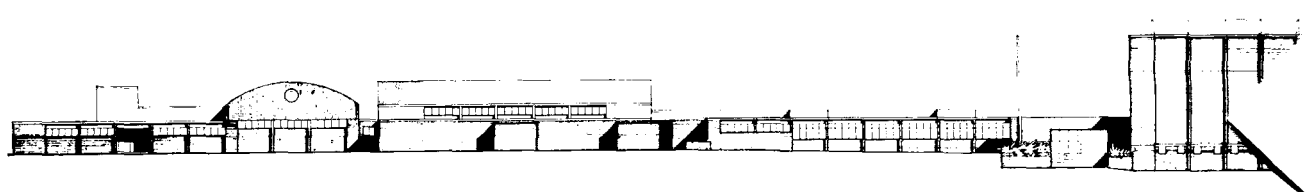
So imagination precedes planning. Nothing very specific comes out of Mr. Richards' divagation, except that the "rootless" man is credited with a positive, valuable culture of his own worthy of respect. The forecast has the nature of mental preparation for planning the mobile future. That it yields no immediate fruit need not bother. Did anyone ever do a specific job on the basis of the old accepted trilogy of "work, people, place"?







Types of site plans for Industrial Hostels (W. G. Holford, Architect), housing workers near the plants. British hostels have their counterpart in our Duration Dormitories (Architectural Record, July and August, 1942). Below, West elevation of Social Center for Industrial Hostel; opposite page, South elevation.
Courtesy Architectural Review, London.



IV Architects and the Standard of Living

Architectural planning couples territorial planning with the standard of living. Hence the all-important Reconstruction Committee of the RIBA converts planning into a three-fold code: of living, of building, of finance.

Architectural planning goes beyond territorial planning, raising buildings in the third dimension. Architecture as a healthy profession depends on the steady raising of the standard of living.

For this reason the work of the Royal Institute of British Architects through its Reconstruction Committee is of utmost interest. It projects the improvement of standards as a prime object of planning.

The Reconstruction Committee was formed in March, 1941, with subcommittees on Policy; Planning and Amenities; Housing; Building Legislation; Building Technique; Architecture and the Building Industry; Professional Status and Qualifications, and finally Public Relations.

So far as mere territorial planning is concerned, the Reconstruction Committee did yeoman work supporting the investigations of the Big Three Committees; but its own more specific contribution was of course in the field of building.

Broadly grasping the subject, the Committee proposed that postwar Britain build and live under a threefold code:

1. "*A Code of Living,* dealing with planning for human needs. It would set out the ends for which planning should aim.
2. "*A Code of Building,* dealing with structural standards and technical needs.
3. "*A Financial Code,* dealing with the financial provisions necessary to give effect to the Code of Living and the Code of Building."

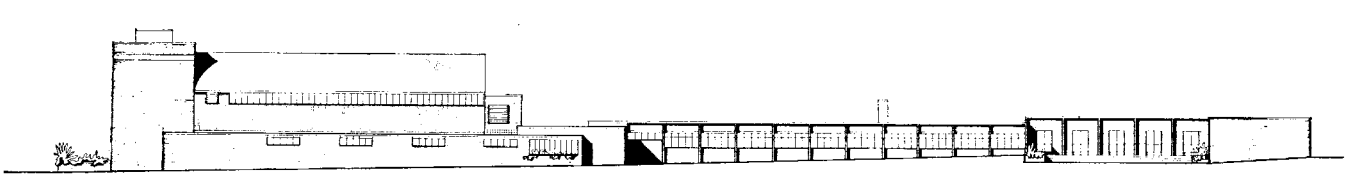
Important innovations are introduced, making the living code depend not on minimal but maximal performance; the building code depend on standards set by research; the financial code serve not the "free" operation of supply and demand but the terms of the living code.

In considering each of these Codes the Committee introduces remarkable innovations. Thus, in the proposed Code of Living, the ordinary Mandatory Provisions for Health and Safety are separated from the Amenity Standards, *which are made not minimal but maximal.* This is highly suggestive. The Regional Authority, in which amenity regulations are vested, would be set free from wrangling with lawyers about the least that must be done, free to aim with administrative judgment for the *highest* performance possible, within the stated framework, in the specific region.

So, too, the proposed nation-wide Building Code is made to depend not on whim but on the work of a proposed National Building Research Organization, which would be like our own Bureau of Standards with an important exception. The exception is that the Research Organization would be required to make public reports frank even to the point of disapproval, being exempted from possible libel suits on the part of individual proprietors of equipment or materials.

The functional standards set up by the Research Organization would be used in codifying living standards and also in setting up the Building Code. Administration of the Building Code would be by a National Building Board responsible directly to Parliament.

With respect to the Financial Code, the Committee stresses the great difference between profitability and social need. Manchester economics used to assume that the two are the same. The Committee believes not; unregulated operation of supply and demand must be modified, therefore, by the correctives of Licenses and Priorities. In the financial context the Committee does not set itself up as a final authority but states its case through a series of questions about the degree of public financial aid and public participation: "Is it not probable that there must be compulsory purchase of very large tracts of land," they ask, "some of which shall be sterilized (as far as building development is concerned) and permanently allocated to agriculture; some of which will be required for immediate development; and some of which will in consequence become ripe for development, insofar as it may be required in the future for completing the scheme? Will not a completely new financial mechanism be required for carrying out this great scheme for compulsory purchase?"



British architects exercise leadership within the Building Industry. This industry is to "do fifteen years' work in three" through agreements, reorganization, science. Far-reaching implications are found in the stress on "vertical" organization, restoring the unity of performance of the master builder.

V Architects and the Building Industry

Sir Ernest Simon has been quoted as saying that the British building industry after this war will do as much in three years as it did after the last war in fifteen. This manifestly demands not only integrated national development and planning but the extensive reorganization of the industry.

A part of this will be the direct outcome of efficient methods hit upon in the war emergency. For example, there is a shift of emphasis discernible from horizontal to vertical job organization. Vertical organization may be applied to the professional work alone or again to the entire job, from designing to erection. Speaking, for the moment, of design alone, the more customary method is to break up a complicated large project into specialist layers, such as architecture, structural engineering, mechanical engineering, sanitary engineering, and the like. Since every such "layer" goes into a different drafting room there is every incentive to reduce the terms of planning to the simplest and most elementary and routine character for the sake of easy understanding. The vertical scheme, on the contrary, depends upon a team of specialists of various kinds collaborating upon the one job. It encourages consultation, shortcuts, innovation, stimulation and good management. Moreover it raises a spirit of friendly rivalry among various teams on points of excellence and rapid performance.

In British war work one group of some 50 architects with allied technicians under the leadership of Professor W. G. Holford were reported, in February, 1942, to have designed and superintended the erection of some $25,000,000 in war factories and hostels, the total cost of their services amounting to something less than 2½ per cent of the cost of the projects.

This principle of vertical organization is capable of further extension, so as to include builders and building labor, through the organization of job committees. It recreates, in point of fact, the master builder in his modern guise. The Royal Institute seeks to apply the same principle upon a national scale when it proposes to the Government that "it abandon the method of treating with each section of the building industry [horizontally] as a separate entity" and deal with it, instead, as a whole, "through the existing machinery in the Building Industries National Council [roughly the equivalent of our Building Congresses combined with the Producers' Council]. It is hoped that eventually the role of every section of the industry will be clarified and defined."

Under way is something that may be described as the gradual professionalization of the entire British building industry. Meanwhile the voluntary architects' panels, first devised in emergencies, are apparently developing a high potential of regular service.

In a sense the RIBA is aiming at further professionalization of the industry as a whole, in terms of 1) a Professional group; 2) Employing group; 3) Operatives group; 4) Manufacturing and Distributing group. In such terms the RIBA Committee was even ready to go so far as to propose post-war surveys conducted in terms of a "unit of work" comprising not only materials and man hours but also professional and other services needed, in their proper balance. Upon the basis of "units" needed, the committee thought that questions of building methods could be decided, such as "the use of standard types, temporary or permanent buildings for certain needs, factory-built or prefabricated dwellings."

Another type of progress lies in the development of architects' panels. The RIBA had originated such panels in the first place to meet the appalling deficiencies of the 1932 Town and Country Planning Act, which permitted the less enterprising local authorities to flounder with no architectural advice whatever. The panels were voluntary, unpaid, and advisory, composed of architects, mainly local, upon whom the Authority *might* call. During the war the RIBA again organized panels, upon a broader basis, comprising various types of architectural skill placed at the disposal of Government agencies. These panels were put to extensive use. The possibilities of useful correlation, between Government architects setting standards and local private architects using their judgment in making local

Science in building may not develop on lines of American prefabrication. A determined effort is being made to put the results of advanced research in the hands of every architect and builder.

adaptations, were most happily exploited in war housing done under the general direction of G. A. Jellicoe for the Ministry of Supply. It is now proposed that after the war the use of architectural consultation in planning be made compulsory in both town and country, the panels thus acquiring statutory character.

The British have put forth many efforts toward making building more of a science but these steps are not reported in detail here because they so nearly duplicate our own. British interest in American prefabrication, as an instance of scientific procedure, is so intense that the *Journal* of the RIBA has published addresses of all available American producers. But since lumber products are scarce, British efforts have been largely confined to the BCF hut based on the British Concrete Federation system of slotted posts and panels, adaptable to use in every sort of encampment structure, and produced in 180 shops spread throughout the country. The RIBA proposals with regard to the Building Research Station would have the effect, however, of putting the results of advanced research within reach of every individual architect and builder.

VI Architects and Public

British architects, it is plain enough, have inhabited no ivory tower. The moves they have made toward reconstruction have never been out of sight of the common people. In February of 1943, the RIBA, acting in behalf of the Building Industry, instituted an exhibition at the National Gallery entitled *Rebuilding Britain.*

The booklet issued under the same title is in itself the finest testimony of the close touch between the British architects and the British public. In terms that every layman can understand—and feel—the case is put for comprehensive and orderly reconstruction. Anybody can see what the architects are aiming for, and everybody is told for just what kind of program the British architects stand. In picture and story is developed the theme of the kind of country that "deserves victory" and in the appendix the architects take position on policy. The booklet in short is democratic leadership made real.

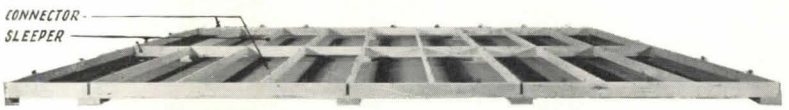
British architects have learned that their future lies in service to the largest public, within the framework not of chaos but of orderly planning. They are informing the public, helping the planners, not just demanding the jobs but gaining the public's confidence.

For American architects the story is full of suggestion, instruction, inspiration. We, too, face the air age which has shrunk every mile to 528 feet. We, too, need to consider the most comprehensive problems of *National territorial* planning. If our *blighted areas* had been struck by bombs they would be no worse than they are as places for human habitation. In devising *new city plans* we lack the clear-cut advantage of the blasted holes and gaps. The millions of wandering workers, industrial or agricultural, returning "home" will make just as difficult a problem of the relation between town and country as does the British need for growing more food. Are we any less desperate in our need of codes setting up clear *national standards of living, building, financing?* Is our *building industry* well enough integrated?

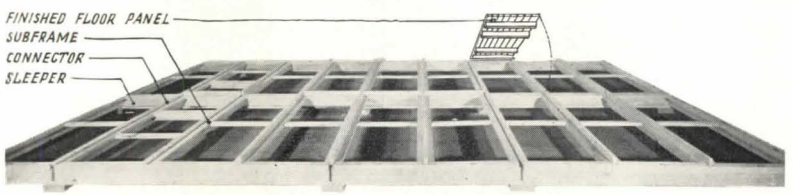
There is instruction, perhaps, for architects everywhere in the British architects' approach. Nowhere in *Rebuilding Britain* is there any special plea for the retention of an architect. The British architects have not argued for themselves, they have simply made themselves indispensable. Architecture and architects can never flourish on short aims, cheap hopes, extemporized devices, and scattered ideas. But by working shoulder to shoulder with all those who are creating a large framework of planning and order and broad constructive policy, the British architects have made their own permanent place. When ministries, municipalities, industries, boards, institutions start forth, at last, upon the large programs that have been organized, it will be only natural for them to turn to the men who have shown them, right along, how to put quality, amenity, standards into the work—and how to give their country a noble and lovable face.

PREFABRICATED PANELS

FOR PACKAGED BUILDINGS



Floor sleepers of small house with mainstay of wedge connectors installed in slots, ready to take subframe. Three connectors in each 10′ length



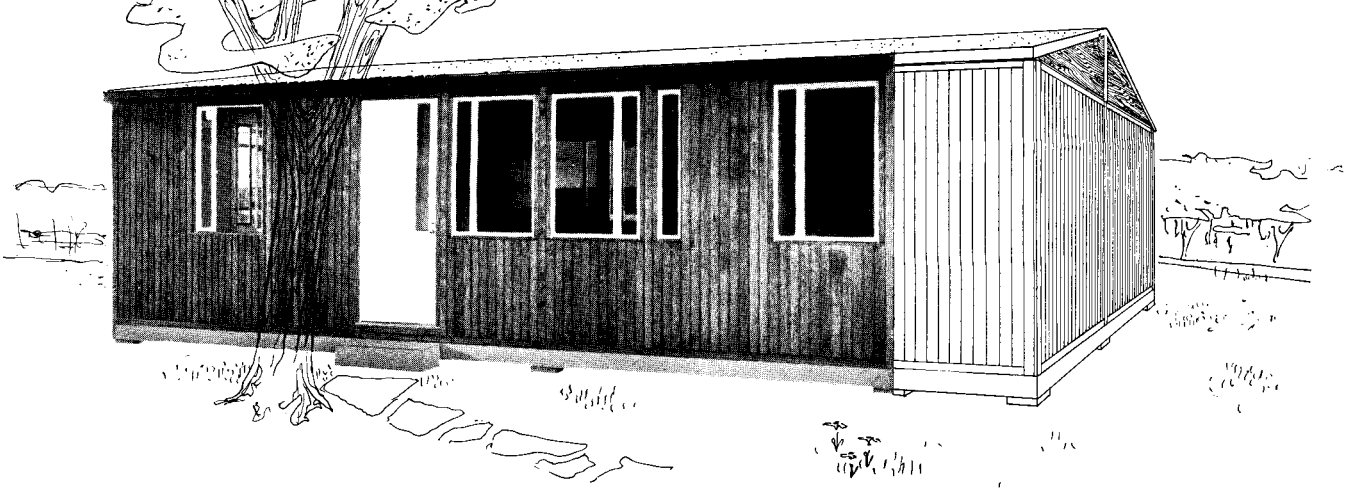
Subframes in place ready for the finished floor panels

Assembly of small house, fitting exterior wall-panels in place at corner; also interior partitions, before finished floor panels are installed

SYSTEMS of prefabricating the shells of buildings—the enclosing walls, roofs and floors—have been devised by ingenious architects and engineers endeavoring to produce buildings by mass production methods, thereby saving time, material and labor. Most of these are panel systems with various types of joints, permanent or demountable, and designed with modules of various sizes. Many are having their first practical tests in our war housing, others have been on the market for years. One of the most recent, advanced and, in some ways unique, has just been demonstrated and tested and is here described for the first time.

The "Packaged Building System" of the General Panel Corporation of New York City is one of the first prefabricated, fully demountable systems that consistently uses the same module for all dimensions, horizontal, vertical and lateral, a truly *three-dimensional module,* with a standardized joint detail and a wedge connector which is universal—used for all joints.

This system was developed by two pioneers in prefabrication, Konrad Wachsmann of New York City, and Professor Walter Gropius, Chairman of the department of Architecture of the School of Design at Harvard University. Konrad Wachsmann was chief designer at the largest European prefabricators, "Christoph & Unmack A.G., Niesky (O.-L.)" There he designed prefabricated houses from 1926 to 1928. In 1930 Wachsmann published one of the most comprehensive analyses of wood construction, "Holzhausbau" (Ernst Wasmuth Verlag A.G., Berlin). Dr. Gropius experimented as early as 1910 with prefabrication systems in Germany. The culmination of these studies resulted

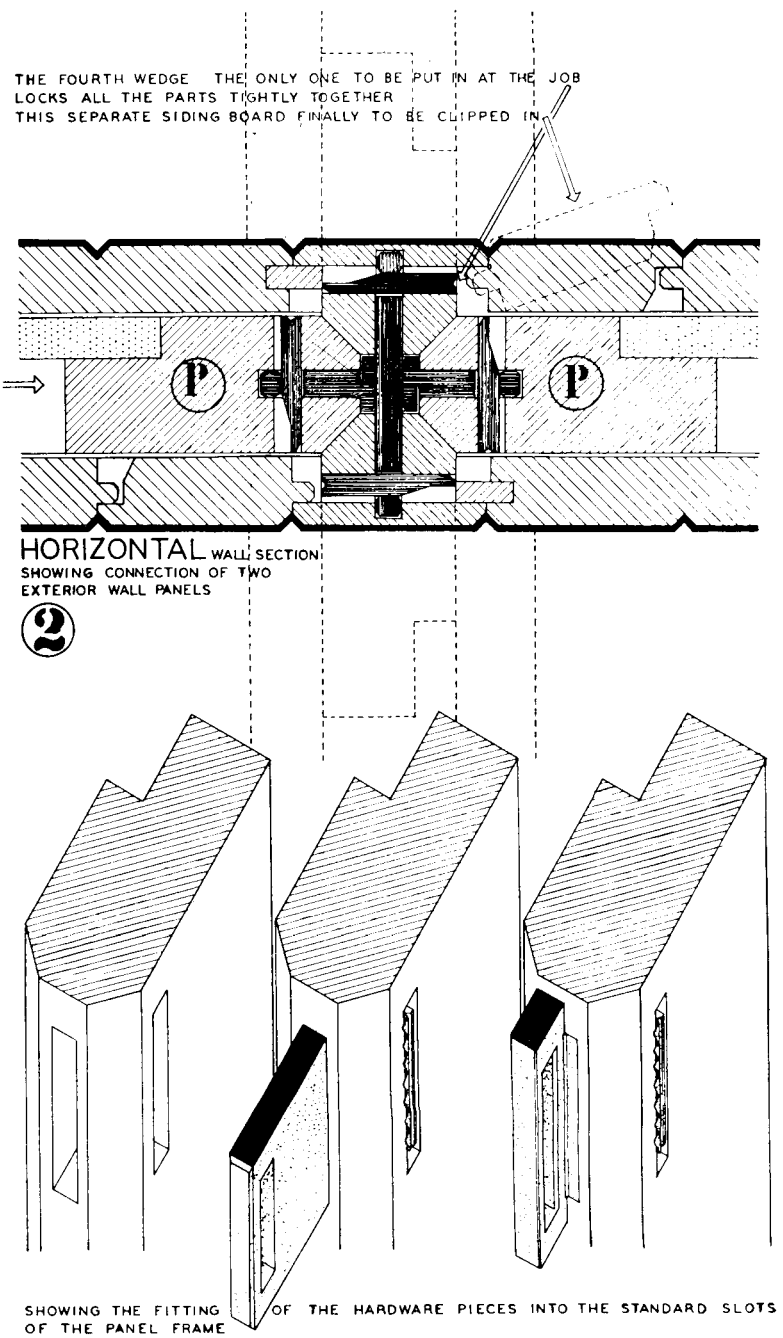


in the well-known "Copperhouse" exhibited at the Berlin Building Exposition of 1931.

The new system developed by these experienced men uses interlocking panels for floors, walls, ceilings and roof, panels which are interchangeable at any time and which are fastened together by patented connectors. Because it is based on a three-dimensional module and uses only one type of connection, this system provides the utmost flexibility. Theoretically the system could be applied to any module. For practical reasons a module of 3'-4" was chosen, as it is conveniently related to the standard bed dimensions (two modules) and a reasonably sized bathroom. It is also a convenient dimension in planning for stairs, doors and window openings. Furthermore, panels of that width can easily be handled by one man.

All panels join on the module line, vertically, horizontally, laterally. Exterior and interior wall panels, floor, ceiling and roof panels are built up on a basic frame. The finish and the different kinds of insulation can be varied according to the function of the panel as well as according to climatic conditions. All panels, even the roof panels, are finished before shipment. All edges are similar in shape and material, thus permitting the joining of any combination of panels. Furthermore, all members are connected by one and the same type of connector in all joints, thus simplifying production and assembly and allowing the greatest flexibility.

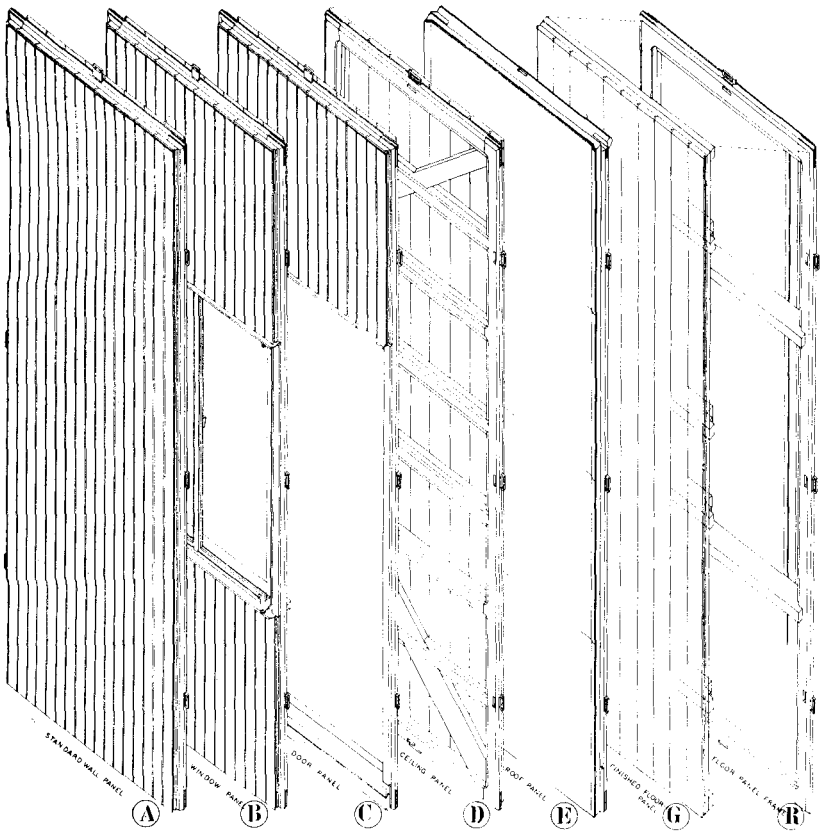
The connector consists of three interlocking slotted metal pieces which, when installed, form a cross on the centre-line of the module. The edges of each panel are beveled, and are slotted to receive the ends of the connectors, which are firmly secured and pulled together by hardwood wedges. Therefore all joints consist of four interchangeable members, the size of which varies according to their function. These members may be floor, wall, ceiling or roof panels, filler strips, columns



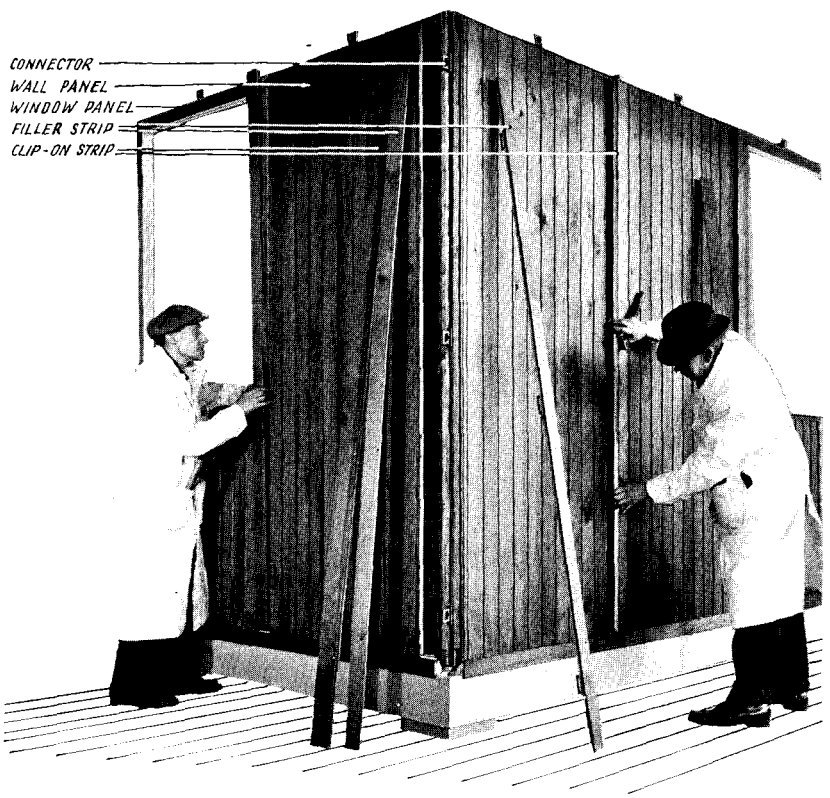
HORIZONTAL WALL SECTION
SHOWING CONNECTION OF TWO EXTERIOR WALL PANELS

2

SHOWING THE FITTING OF THE HARDWARE PIECES INTO THE STANDARD SLOTS OF THE PANEL FRAME



Standard panels; A, door; B, window; C, door; D, ceiling; E, roof; G, finished floor; R, roof. Slotted connector pieces are shown in place at edges of panels



Filler strips being fastened over panel joints at an exterior corner

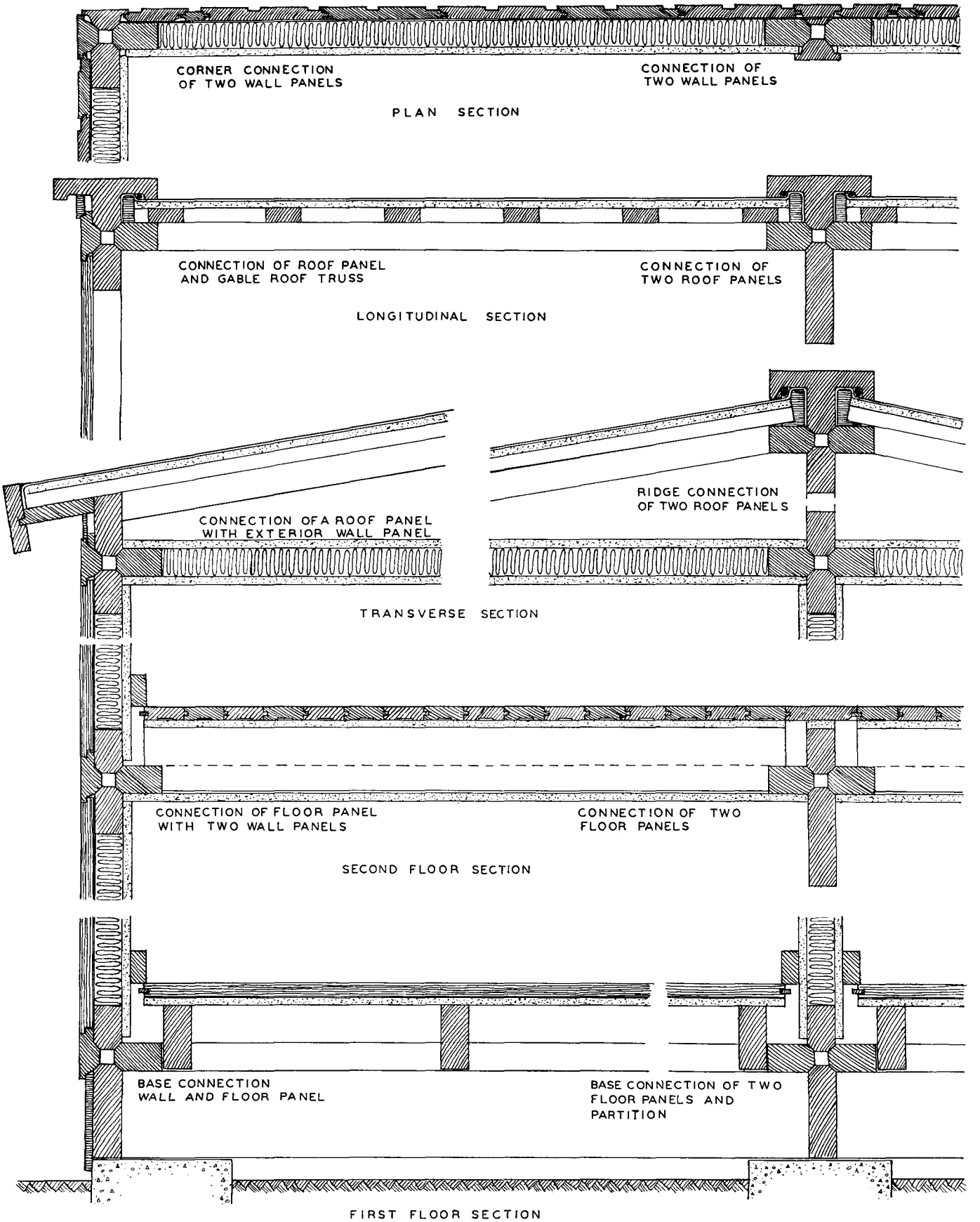
or beams in any combination. The metal connector allows the building to be easily demounted as the wedges can readily be removed by pliers. The connectors are shipped partly connected to the panels, therefore only one out of four wedges has to be put in place on the site.

A special feature of the Packaged Building System is that no rigid sequence of installation is necessary. Several crews can therefore work on the same building at the same time, making speedy erection possible. The same module is used in all directions. No continuous unit will exceed 10 feet, the length of a panel, since that is the maximum dimension of any part. Therefore minor errors will not accumulate in a long building.

The Packaged Building System can easily be used for almost any type of building or any kind of design. Inspection of the details shows readily how this system can be used for two story structures such as barracks, hospitals, or other war emergency buildings. By simply attaching a structural member instead of a filler strip to a vertical joint, and a beam instead of a filler strip to a horizontal joint, long spans can easily be constructed.

A demonstration house was erected in Boston on February 23, 1943. Exhaustive tests of the system were made at Massachusetts Institute of Technology under the direction of Professor A. Dietz. The financing, manufacturing and marketing of the Packaged Building System is handled by the General Panel Corporation of New York City, which was formed especially for the exploitation of this invention and system.

WILLO VON MOLTKE



DETAILS OF THE PACKAGED HOUSE SYSTEM

PLASTICS

...PRACTICALLY SPEAKING

BY ROBERT F. MARSHALL

OF ALL the materials that can go into a building, there probably is none more intriguing to the designer than plastics. Also none more baffling.

In their occasional contact with the subject, architects and engineers have been excited by glimpses of unthought-of possibilities for plastics in new building techniques, and confused by an array of strange laboratory labels and trade names. Much that has been published about plastics has been either so technical as to be discouraging, or too strictly "inspirational," full of romance and startling photography. As a result the average architect admits that apparently almost anything can be done with plastics, but he doesn't know where to go from there.

There is a great opportunity for joining the skills of the architect and the plastics industry. Its realization waits upon a better understanding of their mutual needs and abilities. There should be no serious obstacle to this from the architect's standpoint. For one thing, he can find encouragement in the fact that modern synthetic plastics are so new that nobody knows all there is to know about them. Moreover, the subject is so big and so complicated that no one but a technician in the plastics industry can really be expected to have a full grasp of it.

On the other hand—and this ought to be good news—the facts needed for a reasonably confident approach to these versatile new materials are available, and they are comprehensible with a little patience. As for the special technical information usually expressed in language that bewilders the layman—that will be on tap when it is needed, and there will be able and willing interpreters.

Make no mistake about it, you will need expert advice when you really start to design in plastics. A single plastic can have a surprising range of properties. It can be hard or soft, elastic or not, rigid or flexible, clear or colored, to mention a few of the possibilities. So obviously it will not be enough merely to specify a plastic by name. To be sure the right plastic is picked, you will want help from someone who knows the variables of your problem.

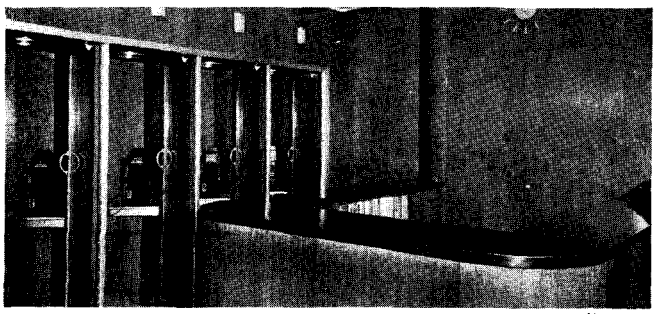
This help will be forthcoming. More on that later. Meanwhile it is the purpose of this article to lay a modest foundation for an understanding of the possibilities of plastics in the building field.

One thing should be said at the outset. Plastics are not to be considered solely, or even chiefly, as substitutes for materials like glass, copper, aluminum, steel, wood and stone. Plastics manufacturers are prompt to point out that each of these materials has special properties which make it eminently suitable for certain uses, and that when these required characteristics cannot be duplicated in a plastic, replacement is a mistake.

Thus there are plastics which have the optical qualities of plate glass, are adequately rigid, transmit less heat than glass, and of course will not shatter. They do not, however, have the dimensional stability of glass. They expand and contract with temperature changes. Also, their cost exceeds that of ordinary plate glass. Hence, in the opinion of the plastics industry, there is at present no plastic that can be substituted generally for window glass. But in glazing where non-shatter quality may be more important than cost or dimensional stability, as in a war plant, the tables are turned in favor of plastics. The same common-sense reasoning holds for hundreds of potential plastics applications. When plastics fail in performance it usually is because the rule of common sense has been ignored, with not enough thought given to the needs of the job and properties of the material.

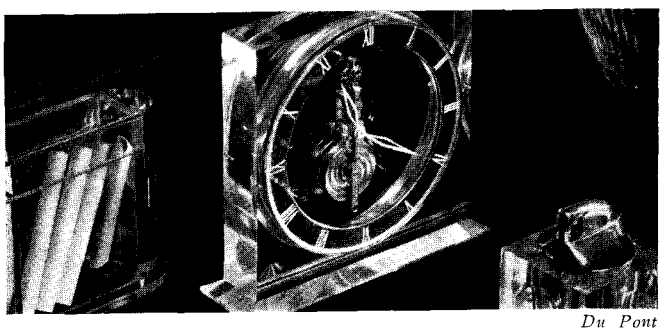
Going back to the matter of substitution, it is worth noting that men who know plastics think of them as materials which, instead of replacing standard materials, often can serve to heighten their usefulness. Plastics and wood together, for instance, can be employed where neither material would do by itself. Resin-bonded plywood is an illustration. There are many others: the glass-and-plastic sandwich which is safety glass; plastic-coated decorative fabrics that retain their full original appearance yet are non-flammable, waterproof and need never be laundered; plastic-

Rohm & Haas



Formica

Monsanto



Du Pont

impregnated glass wool pressed into a slab with heat-insulating and structural qualities; plastic surface coatings, clear and weather-resisting, for exposed metals; canvas impregnated with plastics and molded into a light, strong and semi-rigid shape—like the seats now made for airplane pilots. These and kindred combinations of plastics with other substances point the way to vastly wider utility for familiar building materials when plastics again are to be had for civilian use.

You may have wondered occasionally where all the new plastic, or part-plastic, products for building will come from—just who will make and sell them. The answer is found in the accompanying diagram showing, in simplified form, the organization of the plastics industry.

Many of the practical questions concerning plastics and their uses are answered in this article. Others may occur to you, for the subject is complex and new developments are frequent. We will be as helpful as possible in supplying additional information in response to your needs. Just write Plastics Information, Architectural Record, 119 West 40th Street, New York, N. Y.

The flow of materials starts with manufacturing chemists who make and sell plastics in unprocessed form—liquid, powder or flake—and also in semi-finished forms such as sheets, rods and tubes. The liquid, powder and flake materials are converted into finished products, essentially through application of heat and pressure, by three main kinds of secondary manufacture:

Molding of products relatively small and intricate in shape, like builders' hardware, bathroom lamp shades and electrical parts. Recent developments allow molding of articles as large as fluorescent lighting reflectors.

Extrusion of products of continuous shape which can be cut to any desired length, such as stair rails, water pipe, electric cable insulation, picture molding and thin strands of plastic that can be woven into screening, or textiles for draperies and upholstery.

Lamination of products consisting of alternate layers of plastic and some other material, bonded into a homogenous unit. Examples are ordinary plywood, heavy structural members of laminated wood, and laminations of high tensile strength paper for semi-structural parts such as airplane wing tips.

Fabrication is a fourth method of turning out finished plastic products, notably articles which either cannot or need not be molded, extruded or laminated. These are constructed of the standard sheets, rods and tubes sold, along with unprocessed materials, by the primary manufacturers. Furniture and showcases are among the items of building equipment that have been fabricated wholly or partially from these standard plastic shapes, which, incidentally, are to be had in a broad range of colors.

Firms producing finished plastic products number in the hundreds. Some specialize in a single process, like molding. Others do extruding, laminating and fabricating as well. In fact there is one concern, the country's largest molder, that manufactures some of its own basic materials.

With a few important exceptions, these "convertors" of plastics did not sell directly to the building field before the war. Much of their business came from manufacturers of consumer and industrial goods who needed plastic parts or containers for their own products. Today, with the chemical ingredients of plastics at the top of the critical list, molders and other convertors—again with a few important exceptions—are even farther removed from the field of building. But when restrictions are lifted some of them undoubtedly are going to make a beeline for the gigantic construction market now taking form, and their output, feeding into the industry's regular distribution channels, will be one of two main sources of plastic products for buildings.

The other source, perhaps more important potentially,

Monsanto

1.

Monsanto

2.

Pulp molding, one of the latest plastics developments, combines plastics with wood pulp for strength. Above (1) the pulp is mixed with water and plastic resin in a beater before being pumped to a felting tank (2) where the mixture is sucked through a wire-screen die having the approximate contour of the finished

will be the established manufacturers of building materials and equipment. Products embodying plastics in some form will come by the dozen from manufacturers of lighting systems, builders' hardware, plumbing fixtures, kitchen and bathroom equipment, partitions and other building accessories commonly specified in the past. Operating their own molding, extruding, laminating or fabricating departments, these manufacturers will give plastics entry to the construction industry under familiar auspices and on an ever-widening scale.

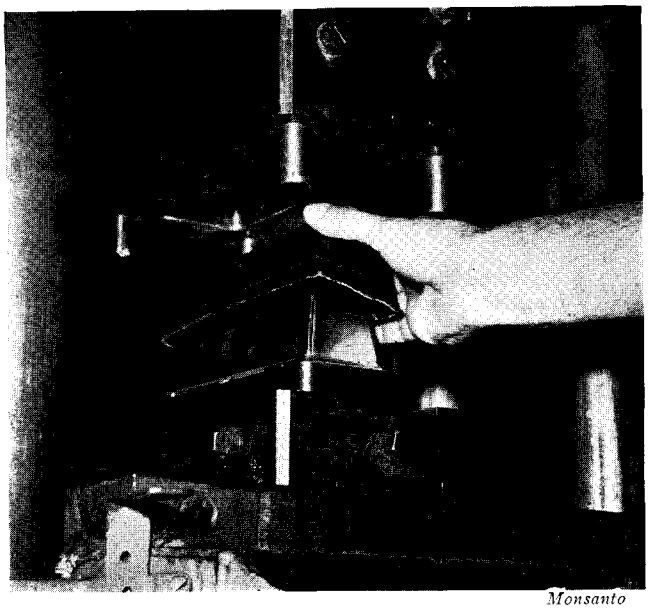
Actually this will be but an extension of a practice dating back to the early use of plastics in American industry. For years a number of manufacturers, especially electrical manufacturers, have found it desirable to make in their own plants a large variety of plastic parts for their products. Among them is the company cited earlier as the country's biggest molder. Manufacturers of paints, varnishes and lacquers likewise buy huge quantities of unprocessed plastic resins, which are increasingly important ingredients of industrial and commercial finishes.

Since plastics must enter construction largely through specifications written by architects and engineers, it obviously is important to know how to go about picking the right plastic for a given job. Depending on the approach to this, the answer can be either relatively simple or the worst possible headache. It is sure to be the latter if the architect proceeds without help, trying to remember the encyclopedic data needed for unhesitating selection of the correct material. Aside from the complex variety of plastics and the further varying of the properties of each type at the will of the manufacturer, laboratory developments are revising the rules almost daily. A plastic which today will not resist heat may be available tomorrow in a form practically impervious to temperature change.

The truth is that, for anybody except experts, the plastics business has to be pretty much a prescription business. The primary manufacturer stands in about the same relation to the molder as a physician does to a pharmacist. By the same analogy, the architect or engineer is the patient. So when you see what looks like a logical application for a plastic, the sensible thing to do is to ask an established plastics manufacturer for his prescription. He may refer you to a molder, extruder, laminator or fabricator who already is making what you want. He may find it necessary, and feasible, to give you a prescription for one of the plastics convertors to fill. Or he may tell you frankly that what you have in mind is impractical, at least for the present. In any case you will have the benefit of the best and latest opinion, based on field experience and laboratory findings. And you'll find the manufacturer ready to work with you, for he knows that you hold the key to one of the plastics industry's richest future markets.

This is not to say that there is no reason for trying to learn at least something about plastics. On the contrary, without a rudimentary understanding of their nature and probable uses one is likely to waste time on ideas that the simplest knowledge of plastics would rule out at the start. And he might well overlook chances to use them to real advantage.

The general conception of plastics as coming from coal, air and water is accurate as far as it goes. To the list might be added salt, limestone, cotton, wood pulp, petroleum and various proteins. But between these substances and the plastic trough of a fluorescent fixture is a long series of complicated processes, reactions and intermediate materials. This is the province of the chemical engineer and will not be gone into here. Attention will be focused instead on the end product—a material which



Monsanto

3.

article. The pulp is deposited on the screen in a spongy layer which is lifted from the die and dried, then given hardness and gloss in finishing mold (3).

can be employed in building construction and equipment.

There are several basic distinctions helpful in grasping the properties and potentialities of plastics. The first is between natural plastics and synthetic plastics. Natural plastics include shellac, paraffin, rubber, asphalt and tar. Such materials have been in use for centuries and will continue to find wide application by reason of their cost, availability or special utility. Shellac, for example, has high dielectric strength, so shellac molding compounds are still used for electrical insulation.

These and other natural plastics will continue to have a place in building, but it is synthetic plastics that hold the real architectural promise. The synthetics—derivatives of "coal, air and water" and cellulose—are more numerous and far more versatile than natural plastics. Their future scope seems bounded only by the ingenuity of formulating chemists and plastics processors. While synthetic plastics are of many types, they all fit into one or the other of these two categories:

Thermoplastic or heat-softening. After being given final form by heat and pressure, these plastics will soften again if subjected to enough heat. The amount required ranges roughly from 140 to 400 degrees F. The material hardens again when it cools. This process can be repeated almost endlessly, for no chemical change takes place in heating or cooling.

Thermosetting or heat-hardening. When heat and pressure are applied to these plastics they undergo chemical change and assume lasting hardness, unaffected by further heat or pressure.

This distinction has meaning to the designer of a building. It suggests, for example, that water pipe of thermoplastic material could be bent on the job by application of heat, but would not serve for hot water unless the softening point of the material were over 200 degrees. Pipe of thermosetting, or heat-hardening, plastic might be safer.

Aside from their opposite response to heat, the thermoplastic and thermosetting groups have no infallible distinguishing traits. They overlap in such qualities as color, toughness, flexibility and insulation. These attributes vary with the individual plastic regardless of its reaction to heat, as a quick review of the general properties of the principal types shows.

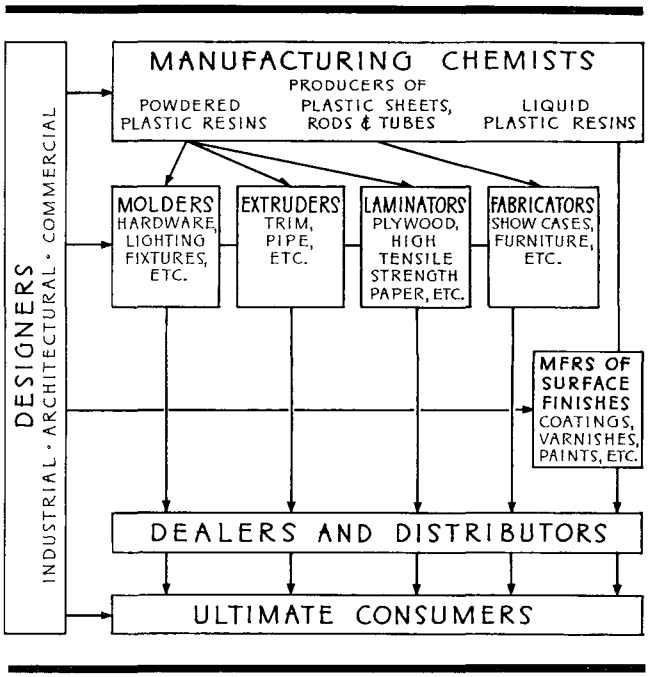
Phenolics (derived from coal): Phenol-formaldehyde, phenol-furfural, phenol-sisal, phenol pulp. Thermosetting. Excellent resistance to moisture and temperature change. Low in cost. Good electrical insulating qualities. Color generally dark, and not light-fast. Strong but not flexible in molded form. For molding, compounded with fillers such as wood flour, asbestos, cotton flock or macerated canvas for strength, fire-resistance and other special properties. Available also in liquid or powder form as bonding material. Typical applications—hardware, signs, corrosion-resistant parts and housings, water piping, electrical insulation, valves, refrigerators, trays, laminates, paints, lacquers and enamels.

Cast phenolics (phenol formaldehyde): Thermosetting. Rigid, easily machined and non-flammable. Inexpensive and obtainable in unlimited range of colors, also transparent and water-clear tints. Supplied in fully cured miscellaneous shapes. Special shapes require inexpensive arbors. Typical applications: drawer pulls, sign letters, housings, kitchen utensils, adhesives.

Urea formaldehydes (derived from coal and air): Thermosetting. Good temperature resistance and electrical insulation. Fair to excellent moisture resistance. Wide

ORGANIZATION OF THE PLASTICS INDUSTRY

This chart is intended to be merely indicative of the factors, functions and products involved, and the industry's normal lines of flow in relation to the construction and equipping of buildings



Rilco

Laminated wood trusses and arches of large span can be made with plastic glues. These hangar arches have an 80-foot span

range of color possibilities from white and pastel to dark. Good light-fastness. Molded with fillers. Strong and rigid when molded. Good bonding material. Typical applications: hardware (not affected by body acids), lighting reflectors, housings, wiring devices, lamination, cold-setting cement, baking enamels.

Melamine compounds (derived from air, coke and lime): Thermosetting. Arc resistant. Odorless. High dielectric strength. Exceptionally tough. Resistant to heat, moisture, abrasion, organic solvents, alkalies and weak acids. Complete color range from translucent to black. Good light-fastness. Excellent for bonding. Typical applications: electrical parts, housings, table ware, adhesives for plywoods, paper impregnation (waterproof), baking enamels.

Alkyd resins (derived from coal, fats, oils and glycerine): Thermosetting. These are surface coating materials with high gloss, long-lasting appearance, excellent weather resistance and strong adhesion to surfaces. Typical uses: air-drying enamels for interiors and exteriors, metal primers and finishes, water-emulsion paints, marine paints, coated fabrics.

Vinyls (derived from coal, air, natural gas, water and salt): polyvinyl acetate, polyvinyl butyral, polyvinyl chloride, vinylidene chloride. Thermoplastic. Crystal clarity and wide range of flexibility, from rubber-like (and elastic) to rigid. Good moisture resistance and electrical insulation. Easy to fabricate. Tough and resistant to weathering and chemicals. Available as molding compounds and as transparent, translucent or opaque sheets. Typical applications: translucent building blocks, signs, displays, flexible coatings for cloth, ingredient for paints and lacquers.

Polystyrene compounds (derived from coal and petroleum): Thermoplastic. Lightest of all commercial plastics, with good dimensional stability and exceptional electrical characteristics. Do not absorb moisture. Have high strength at low temperatures. High in light transmission. Come in transparent form and in full range of colors. Typical applications: translucent tile and building blocks, electrical equipment, edge lighting, signs, displays, flexible coating for cloth.

Acrylic resins (derived from petroleum, ethylene gas, air and water): Methyl methacrylate. Thermoplastic. Available in transparent form and broad range of colors. Light in weight, with excellent dimensional stability. Rigid. Water and weather resistant. Typical applications: compound curved windshields, lenses, displays, signs, furniture, trim, reflectors and house numerals, water and fuel gauges, adhesives, protective coatings.

Cellulose derivatives (from cotton linters, nitric, sulphuric, acetic and butyric acids, salt and coal): cellulose acetate, cellulose acetate butyrate, ethyl cellulose, methyl cellulose. Thermoplastic. Broad range of color possibilities, including configurations. Easy to work. Tough, strong and light-fast. Insulating quality and heat and moisture resistance range from poor to good. Limited flexibility in molded form. Typical applications: molded hardware, electrical appliances, transparent protective sheeting, lacquers. Celluloid (cellulose nitrate) is of this family, but its architectural uses are limited by its flammability.

Casein plastics from such protein sources as milk are readily molded, but their range of use is limited by casein's low moisture resistance, a characteristic which it shares

Westinghouse

After being impregnated with synthetic resins and dried, laminated cloth or paper is pressed between polished steel plates

with shellac. Buttons and novelties probably will remain the most common examples of molded casein. Powdered casein is, however, being used extensively and very successfully as an adhesive in wood construction where it is not exposed to moisture.

One of the disconcerting things about plastics is that two very different kinds of material can be made from the same formula. The properties can be altered by changing the processing method as well as by rewriting the formula. Which emphasizes again the need for expert help in picking the right plastic for a given job.

Plastics costs vary almost as widely as their physical properties, reflecting differences in ingredients, manufacturing processes and production quantities. The range now is roughly 13½ to 85 cents a pound. Just as present prices are lower than those of 1929, when total production was about one-seventh of today's, still lower costs will come as volume grows. How the reduction will compare with declines in costs of other materials is hard to

say, but plastics manufacturers expect their product to hold its own.

As a homely example, a plastic soap dish probably will cost more than porcelain but less than chromium-plated brass. Plastic trim for linoleum will sell at about the same price as aluminum, stainless steel or brass trim. Plastic storefronts should cost no more than marble or glass, and possibly less.

Taken by themselves, cost figures are apt to be misleading. Other elements like appearance, durability and maintenance expense always enter the picture. Plastics have some inherent advantages which may give them an edge over materials with a lower first cost, such as bright, lasting color and an integral surface finish that is easy to maintain. These can be important factors in the buying equation. A plastic-surfaced wall panel, for instance, has only to be set in place. Its color and finish are already built in. It can be kept clean with soap and water, and it never needs repainting.

Plastics probably will make their first important contribution to lower building costs as materials used with, rather

Tennessee Eastman

New design possibilities for terrazzo floors are offered by dividing strips of colorful plastic attached to galvanized iron

than in place of, other construction materials. Inexpensive materials like paper, fabric and wood, when combined with plastics, gain new qualities of strength, moisture resistance and appearance that give them architectural utility. They offer a definite prospect of simpler, faster and more economical construction.

Use of plastics in wartime construction is confined almost wholly to combinations with other materials. Plastic-bonded laminated wood, easily formed to simple shapes and allowing high unit stresses, is supplying roof trusses, beams and columns for hundreds of factories and hangars. Construction of barracks, war housing and a multitude of temporary frame buildings is being speeded by use of natural and synthetic resins as adhesives for joints and sheathing. Resin-bonded laminates are serving as reflectors in fluorescent lighting systems. For shatterproof glazing there is a plastic sheet reinforced with ordinary wire screening. It admits 65 per cent as much light as glass of the same thickness, with only one-fourth the heat transmission. Resin bonding to the sasn prevents water seepage, and the cost with sash is only about 35 cents a square foot. Used for windows and partitions in factories and military buildings, its light weight and small bulk allow it to be flown to the construction site. The same material, minus screening, serves as aircraft glazing.

War demands for substitute materials and stepped-up production have hastened development of countless new uses for plastics, along with new processing methods. Industry and the armed forces will naturally benefit first from these discoveries, but they hold almost sensational implications for the future of building. Foremost among them are:

Low-pressure lamination of plywoods into simple shapes of large area, made possible by invention of resins that form a bond with wood under a fraction of the pressure formerly required. With these new resins, the uncured plywood and a mold are placed in a rubber bag. The air is withdrawn, the contraction of the bag forcing the plywood against the mold. Heat and some additional pressure are applied in a steam chamber where curing is completed. Airplane fuselage and wing sections are being made by this method, known as bag-molding. With former resins, a prohibitively large and expensive hydraulic press would have been needed to mold plywood forms of this size and shape. Bathtubs and shower stalls could easily be bag-molded.

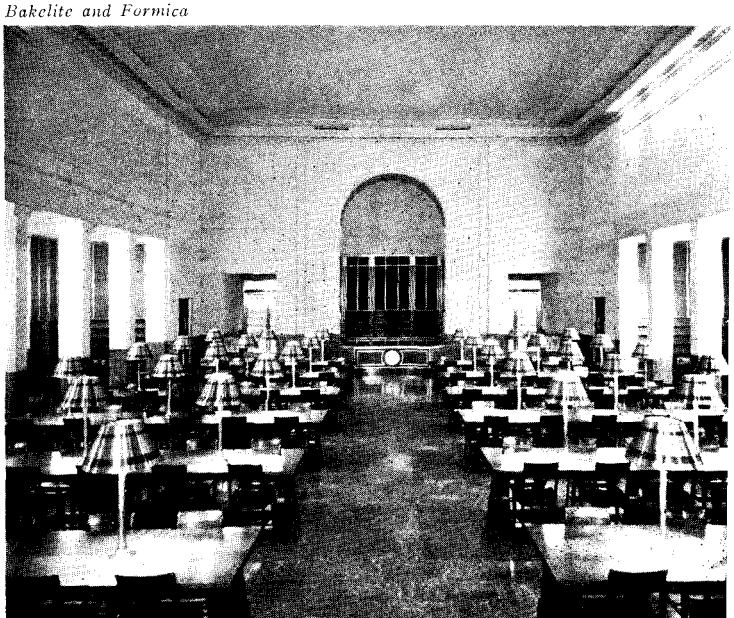
High-frequency curing. The principle of medical science's "fever machine," which destroys deep-seated infections by electrically-induced internal heat, is being applied to the curing of both laminated and molded plastic products. High-frequency current is passed through, say, a foot-thick girder of laminated wood. The resulting internal heat bonds resin and wood in a matter of seconds, against a minimum of forty-five minutes by external heating methods. No greater pressure is required. Costs are cut and output is multiplied.

Pulp molding of large articles of complicated shape. Wood pulp is mixed with a resin solution. The mixture is drawn through a wire-mesh form having the approximate contour of the finished article, the resin-impregnated pulp being deposited in a spongy layer on the screen. This pulp "preform" is lifted off the screen and dried under heat and pressure, at which stage it has the appearance of

(continued on page 86)

Table tops, shelving, baseboards and paneling in the Library of Congress, Washington, are plastic-impregnated laminated sheet

Bakelite and Formica



POSTWAR REALISM VS. ROMANCE

By THOMAS S. HOLDEN

President, F. W. Dodge Corporation

Glowing pictures of a wonderful new world after the war are not without their background of facts, but postwar progress will evolve from the facts not the fantasies

POSTWAR discussions thus far have been confused not only by the pessimistic fallacy of the believers in an inevitable depression but also by the romantic fallacies of enthusiastic prophets of a brave new world. We have all heard much talk of radical innovations to come in construction materials, construction design, construction methods and construction business procedures. With considerable basis in fact, much of this talk appears to be pure romance, indulged in frequently by people who seem little aware either of the evolutionary character of industrial progress or of the already high technical competence of the construction industry.

In New York a few months ago I heard an executive of an airplane manufacturing company state that cargo planes would put all our freight trains out of business within five years following the war, an exciting and somewhat disturbing prediction. About a month later W. A. Patterson, president of United Air Lines, presented at a meeting of the National Industrial Conference Board a careful analysis of the cost of handling freight by plane and of future commercial prospects of cargo planes. Dismissing these overenthusiastic predictions as fairy tales, he pointed out the present average cost per ton-mile of hauling freight by plane is 40 cents, that the lowest foreseeable cost in the future would be about 10 cents, and that the present cost of hauling freight by surface transportation averages less than one cent per ton-mile. He also pointed out that the number of cargo planes sufficient to haul the freight now carried by our railroads would consume 122 billions of gallons of gasoline, two-and-a-half times the capacity output of all the refineries in the world. Obviously, the future role of the cargo plane is probably in the field of fast express service supplementing surface transportation, but not in supplanting it.

About ten days ago Charles F. Kettering, as competent an authority on technical progress as anyone I know, stated that he does not see any flash progress toward a wonder age after the war. "There'll be a little hump in the progress line once the war frees us," he said, "but, generally speaking, the flow of invention will be slow but sure, as in the past." On the same day that Mr. Kettering made that statement another official of General Motors Corporation, Paul W. Garrett, announced that his company would resume production after the war with 1942 models. He stated that the old models could be got into production in six months, while any radically new design might require two years.

Now, it seems to me that the romancers who are predicting all manner of revolutionary changes in construction, overlook the fact that adaptability to change and quick adoption of new materials, new methods, and new distribution procedures is a chief item of the construction industry's customary stock in trade. No great conversion problem was involved when the architects, engineers and builders of the Empire State Building, the Chicago Merchandise Mart, Rockefeller Center and Boulder Dam and large private housing developments turned their organizations and talents to building air and naval bases and harbor fortifications and cantonments and defense housing projects. Henry J. Kaiser has won fame in mass-production of ships, not by being a miracle man, but by applying in highly ingenious ways the known techniques of the construction industry, of which he is an outstanding master.

It is reasonable to expect that the vast war construction program, with its stringent requirements of speed, of economy in use of materials, and of new types of business organization to handle vast new projects will have contributed improvements of lasting value to the construction industry and to the public it serves. It is also reasonable to expect that availablity of plastics, light metals, plywood and similar new products may change building design and construction methods quite considerably. We may see changes in labor relations, in methods of distributing building materials and in the character of some building organizations; these changes are apt to intensify many phases of competition in the construction and material supply field. They will not change the fundamental functions of buildings; nor are they likely, I believe, to come to the front so fast as to render all past procedures and existing buildings obsolete overnight.

In the small-house field, probably of special interest to most of you, I think, we may expect continued progress in the development of mill and factory prefabricated sub-

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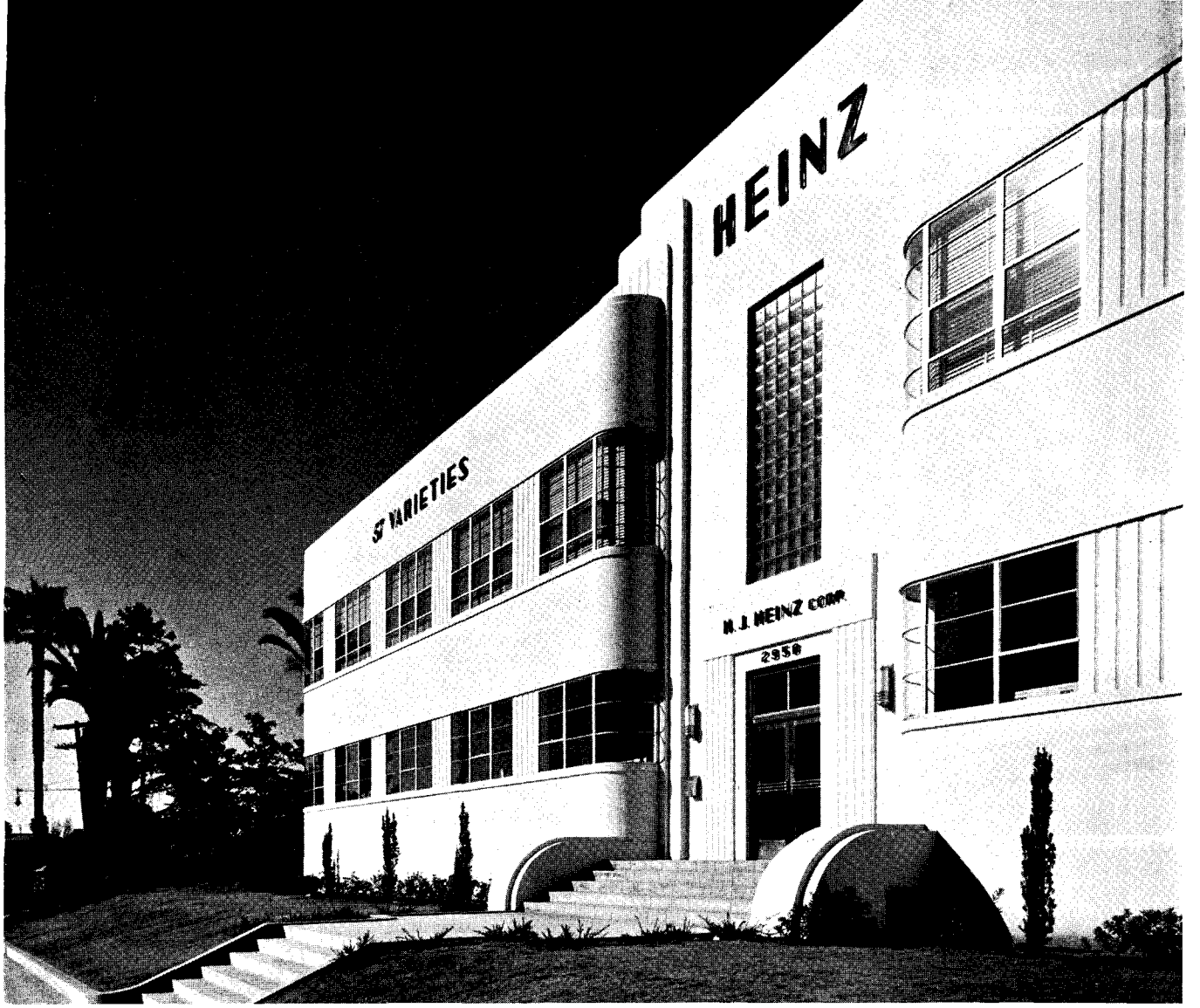


Warehouse for the H. J. Heinz Corp., by The Austin Company

BETTER BUILDINGS FOR INDUSTRY

ONE OF THE more positive of postwar prognostications is that there will be a large demand for buildings for business and industry. Not, perhaps, material plants and bomber assembly lines, but buildings for manufacturing and shipping and merchandising the peacetime products of American industry.

That they will be better designed buildings can also be taken for granted, not necessarily because of wartime stimulus, but because the trend was well established long before the war, as witness the selection of prewar buildings shown in succeeding pages. More and more progressive industrial concerns were making the simple discovery that the most prosaic process, the most functional plan, can be given a plus value in the hands of a capable designer. Since a building always expresses something, it might just as well carry a message of good planning, of efficiency and order.

Take buildings for food processing, which, incidentally, bulk large in plans for postwar. As food processes became more complex and more numerous, each new one progressed from the stage of backroom experimentation on up to assembly-line techniques and merchandising art. Many of the food handling processes developed new building types and new architectural achievements—quick-freezing plants, bottling plants, warehouses, storage locker buildings, dehydration plants, canning factories.

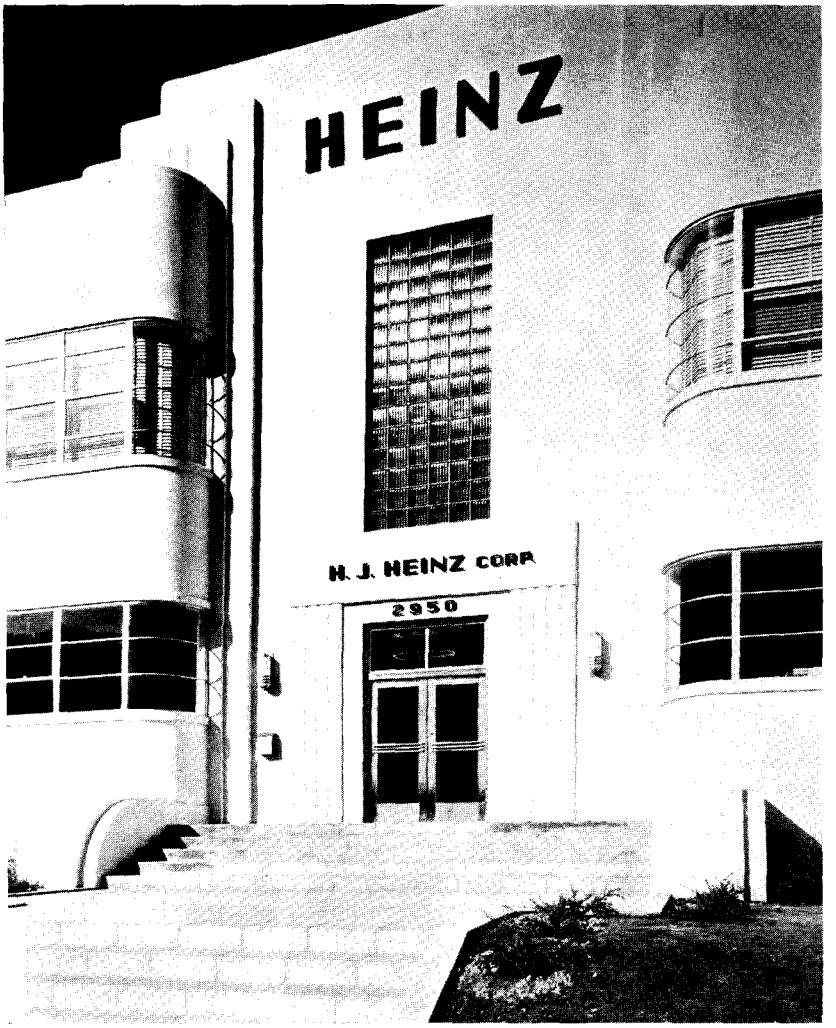
In the last year or so the Department of Agriculture has assisted in the opening of 187 new dehydration plants, such is the stimulus of wartime food requirements. But because of materials shortages, virtually none of these were permitted a new building. Conversion of old buildings, however, cannot hold this rapidly expanding industry, and a whole new family of buildings is sure to appear. And if hopes for victory and peace are realized even in part, the postwar world should see considerable advances in these and other industrial buildings.

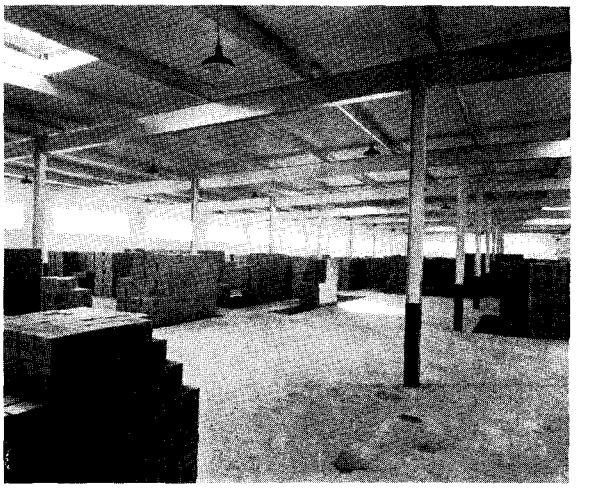
FITTING DESIGNS FOR THE "57"

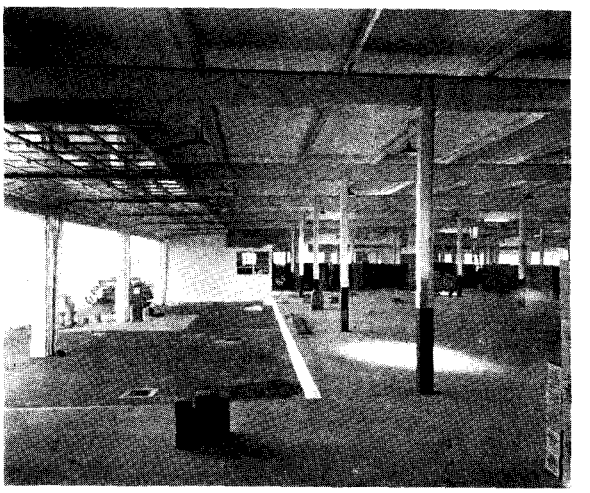
WAREHOUSE FOR H. J. HEINZ CO., LOS ANGELES, CAL.

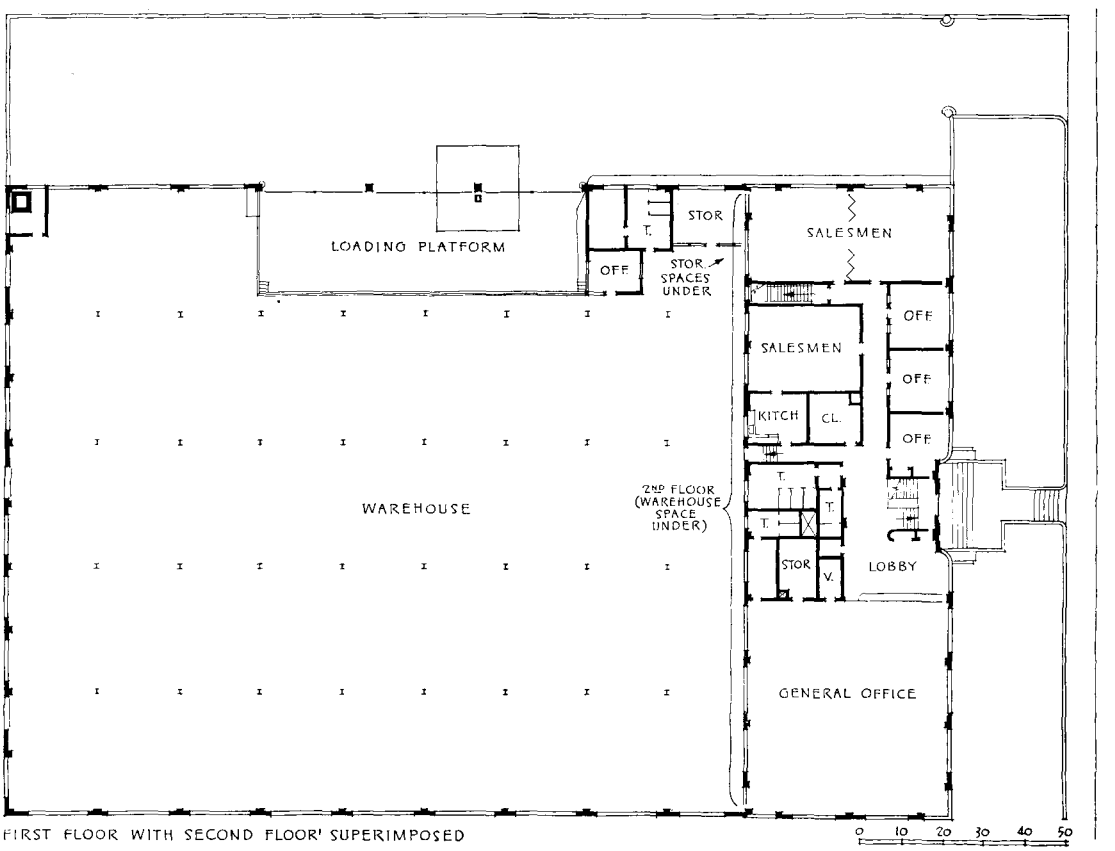
THE AUSTIN COMPANY, ENGINEERS AND CONTRACTORS

IF, in these days of food rationing, it seems strange that *anything* connected with food should need any salesmanship, it is to be hoped that the situation is only temporary. At any rate in planning its most recent distribution warehouses the Heinz Company has gone on the theory that even a warehouse might well take advantage of the opportunity for developing good public relations. This building, and the one shown on page 64, both might be cited as evidence of the fact that buildings for the food industry generally are emerging from an earlier period of chronic drabness, and showing the improvement that always goes with attention to design. This Los Angeles warehouse has overall dimensions of 233 by 151 ft., with a small second-story portion for office space. The one-story section is strictly a warehouse. Framing of the two-story part is reinforced concrete, while the single-story section has concrete walls and steel columns. Wood was used for the roof construction.

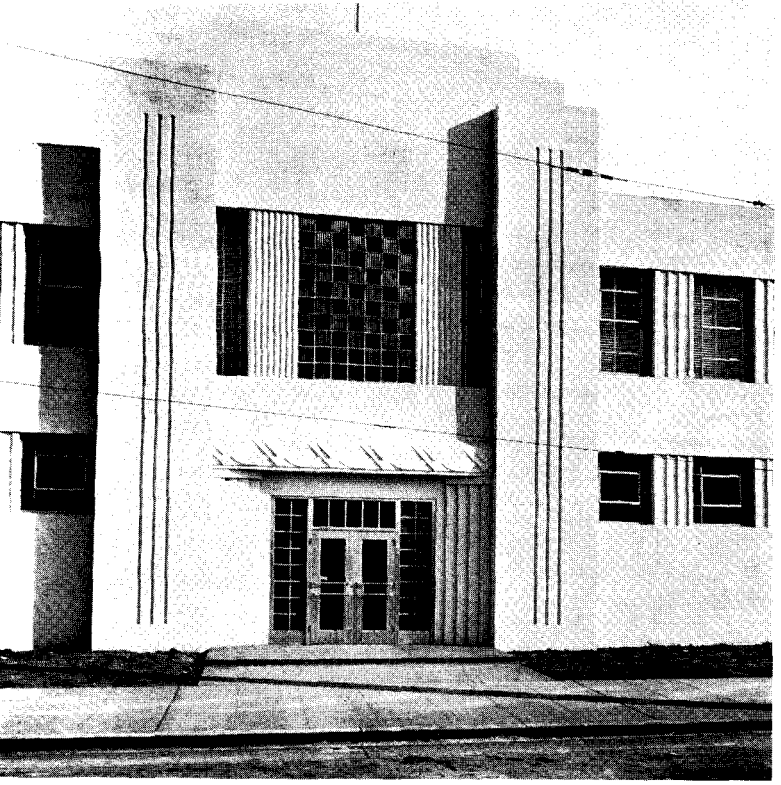








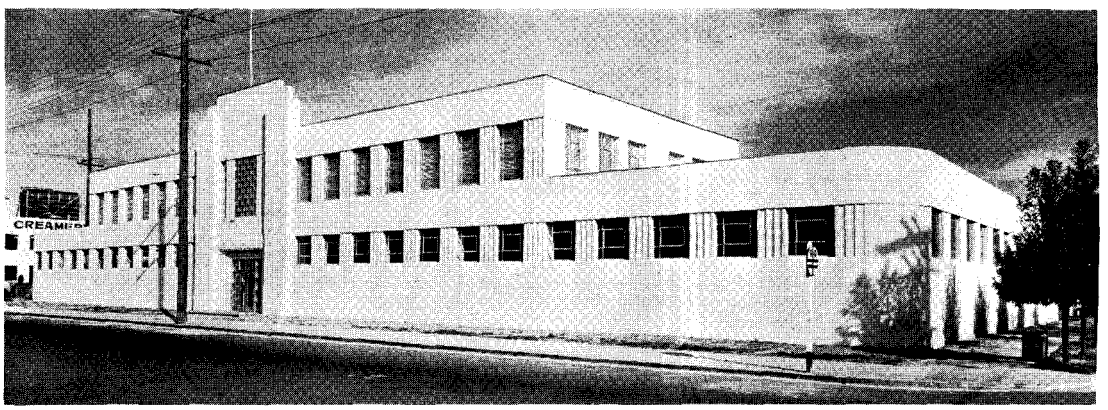
FIRST FLOOR WITH SECOND FLOOR SUPERIMPOSED



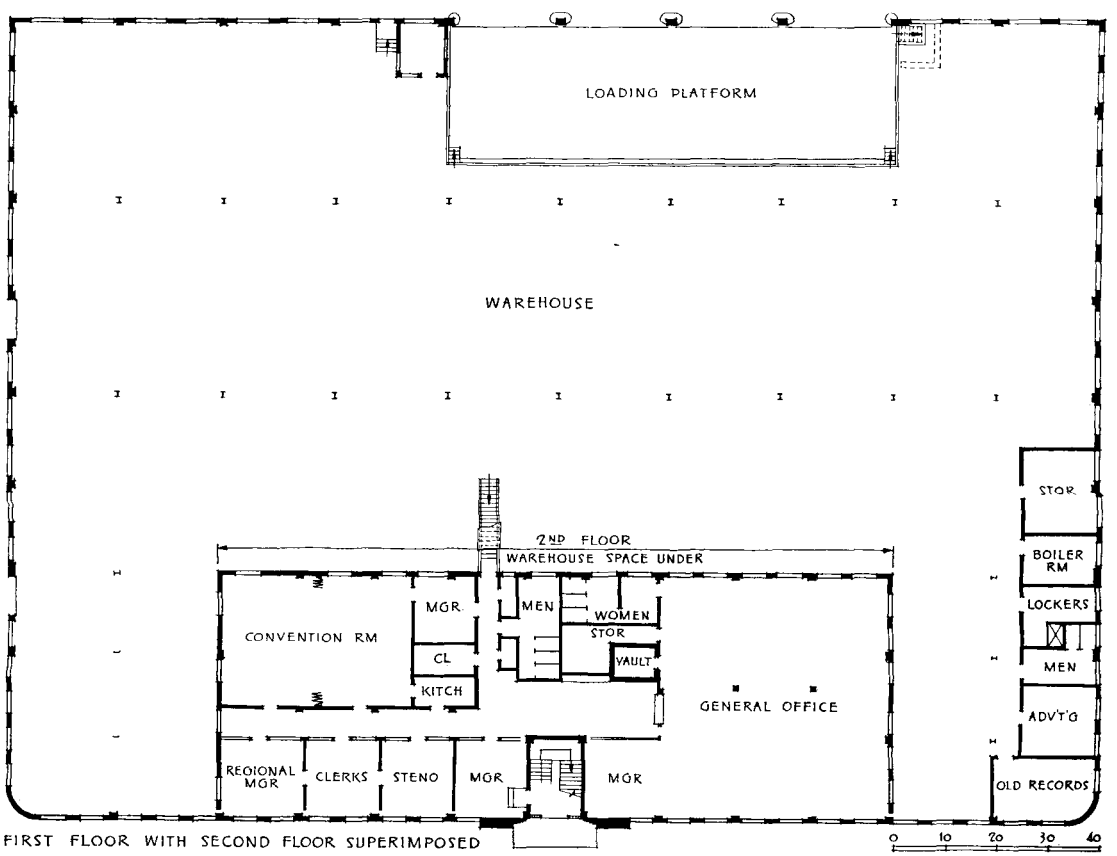
WAREHOUSE FOR FOOD PRODUCTS

THE H. K. FERGUSON CO., ENGINEERS AND CONTRACTORS

WHILE this building represents another result of the owners' desire to give visual attractiveness to their warehouses, it was designed also for economy of maintenance and long life. The architectural concrete contributes to the first two objectives, and heavy reinforcing promises extra sturdiness and resistance to earthquake shocks. Plywood forms were used for the concrete work, with form panels arranged systematically, so that the effect would be pleasing even if the joint lines should eventually be discernible. Forms were removed early and the concrete surfaces rubbed with carborundum stones, then painted with portland cement paint.



WAREHOUSE FOR THE H. J. HEINZ CO. IN OAKLAND, CAL.

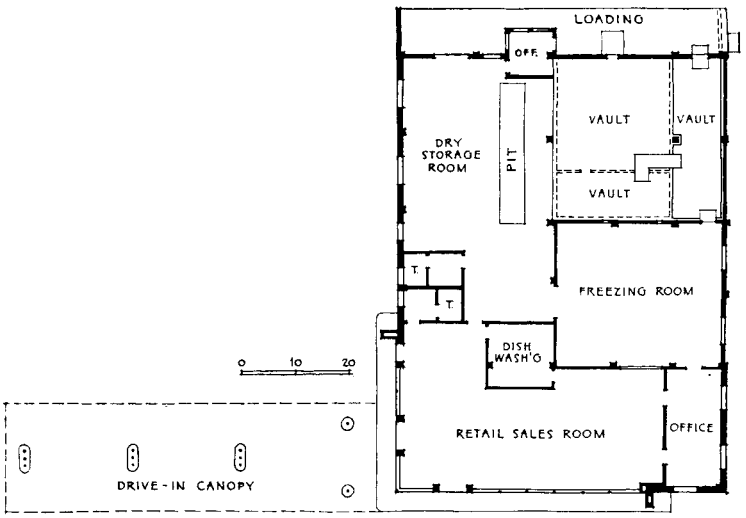


FIRST FLOOR WITH SECOND FLOOR SUPERIMPOSED

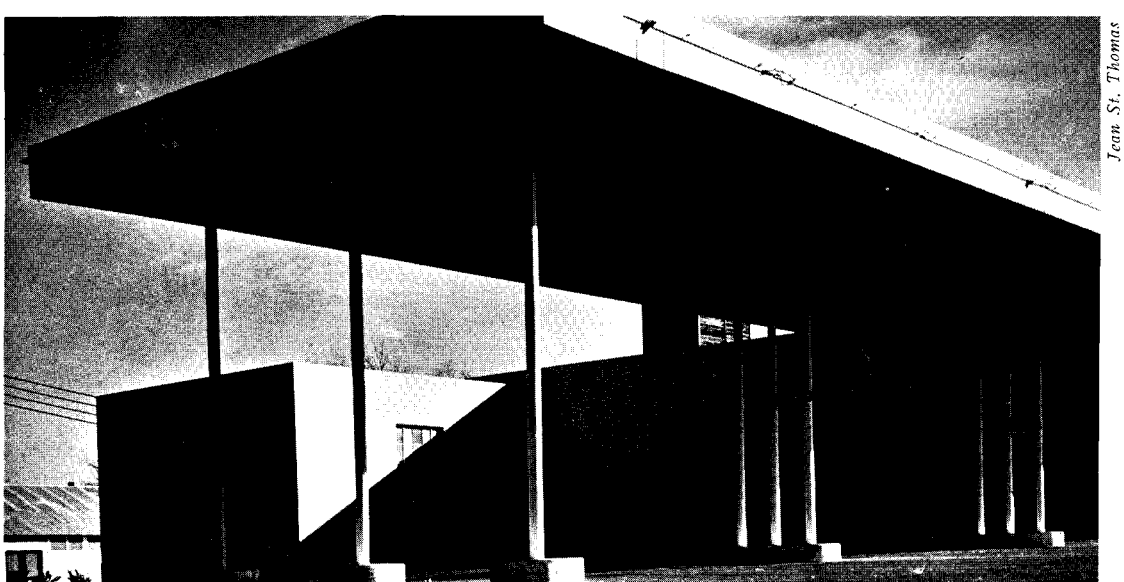
ICE CREAM PLANT AND SALES ROOM

H. F. KUEHNE, ARCHITECT AND ENGINEER

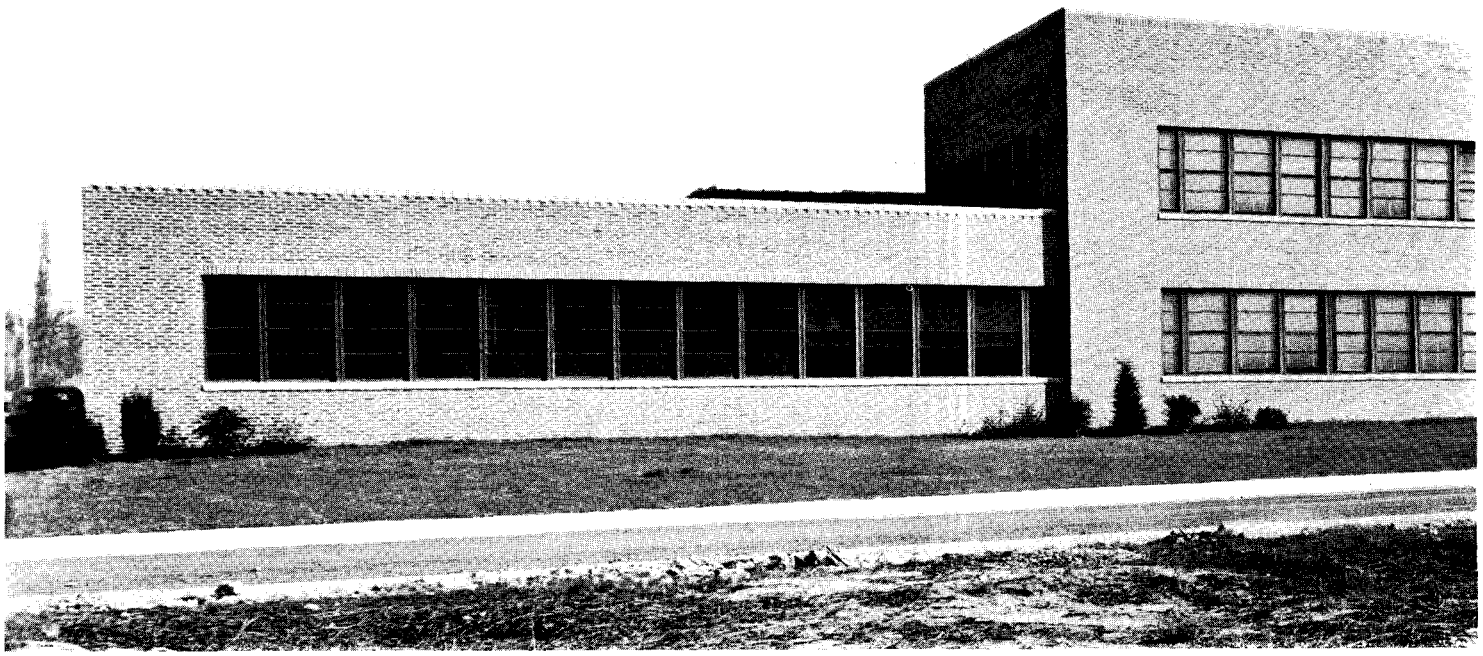
HERE was an unusual planning problem, involving design of a combination ice cream manufacturing plant, drive-in retail sales outlet and soft drink parlor, with a milk bottling plant to be added later. The building is of fireproof construction throughout, with concrete frame and masonry walls, and steel joist roof. The extended canopy is constructed of steel joists supported by I beams and pipe columns, designed to overcome the problem of possible sway on the long canopy roof.



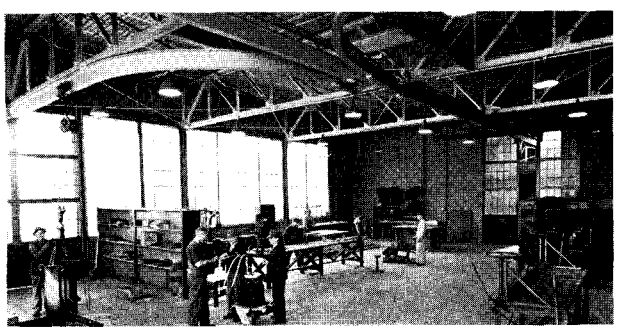
BUILDING FOR HEEP SUPERIOR DAIRIES IN AUSTIN, TEXAS



Jean St. Thomas

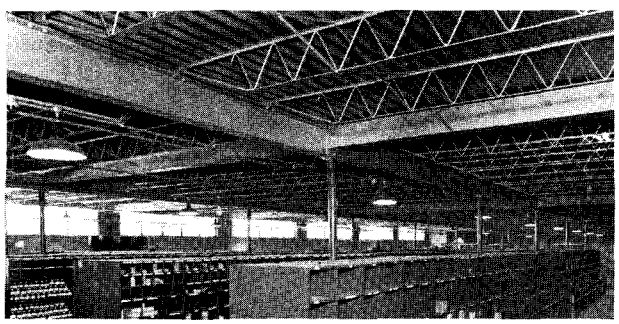


NEW CENTER FOR SERVICE CREWS



Transformer repair shop, with monorail hoist for loading

Materials storeroom, showing structural members of steel

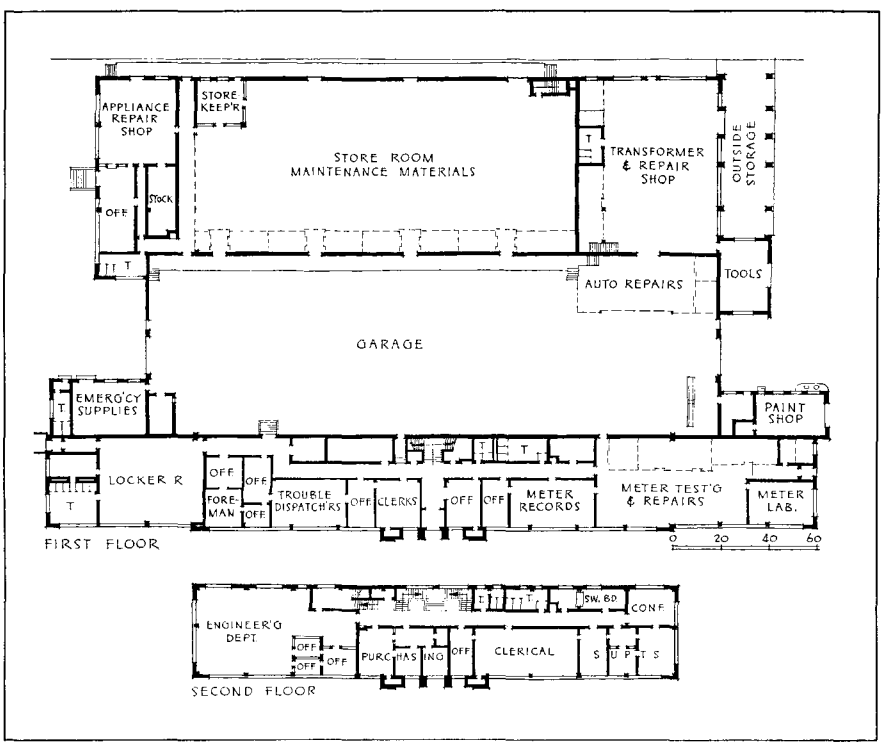


R. H. HUNT COMPANY, ARCHITECTS

WHEN construction of this service building for an electric utility company was first contemplated, it was estimated that savings due to the centralization of various service departments, then scattered over Chattanooga, would pay for the building in about five years. And the estimates are proving out. The building houses office space for five departments and shops, garage and storage space for a wide variety of service operations. It is designed for the later addition of a third story on the office building portion. Construction is reinforced concrete and steel, with finish walls of face brick and stone trim. The overall size of the building, 320 ft. and 192 ft. deep, was determined by the necessity of ground floor space for many maintenance departments. Layout considerations were unusually numerous, because of the variety of operations, and involved also such problems as the isolation of office space and despatchers' quarters from noise and confusion. Truck traffic considerations were also involved, and the need for inside loading space for transformers and other heavy items. Thus the garage was centrally located, where, with one-way traffic, trucks can serve either side.

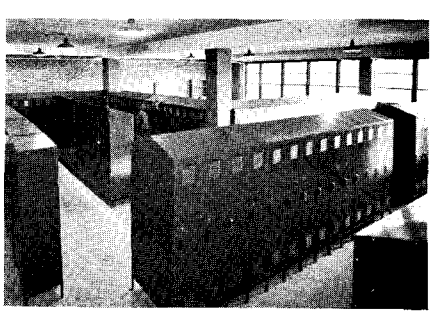
A. Charles Hinkle

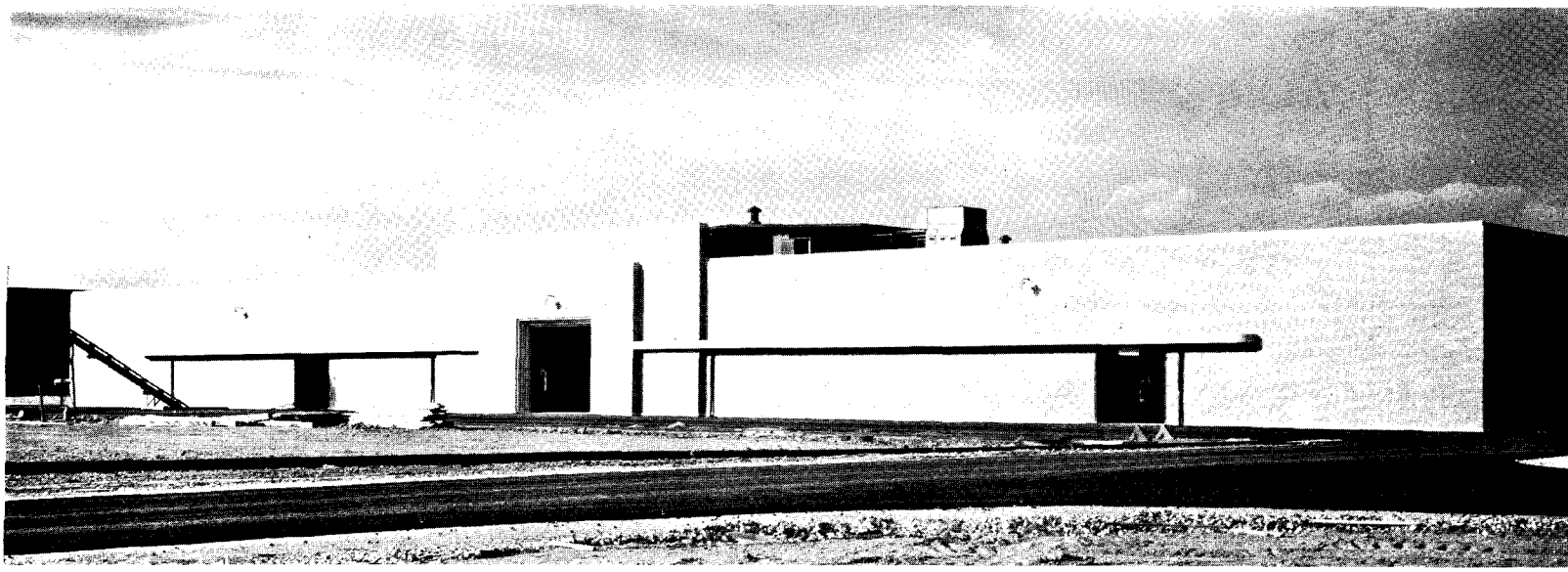
DISTRIBUTION SERVICE BUILDING FOR ELECTRIC POWER BOARD, CHATTANOOGA, TENN.



Garage, for both loading and parking

Employees' locker and assembly room



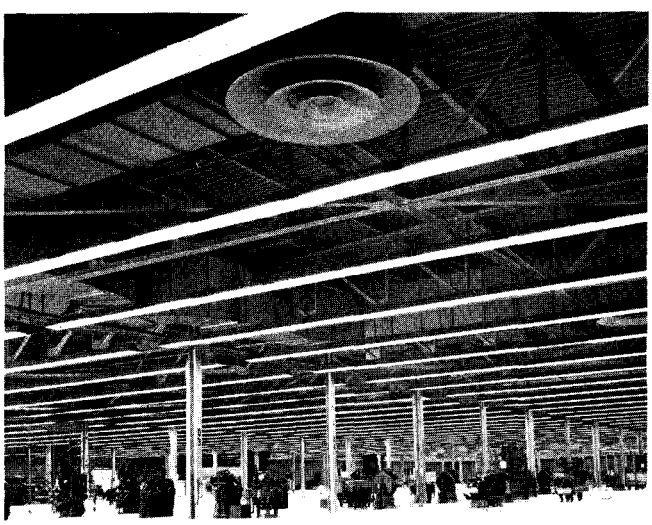


WINDOWLESS ORDNANCE PLANT

RUST ENGINEERING COMPANY, DESIGNERS AND CONTRACTORS

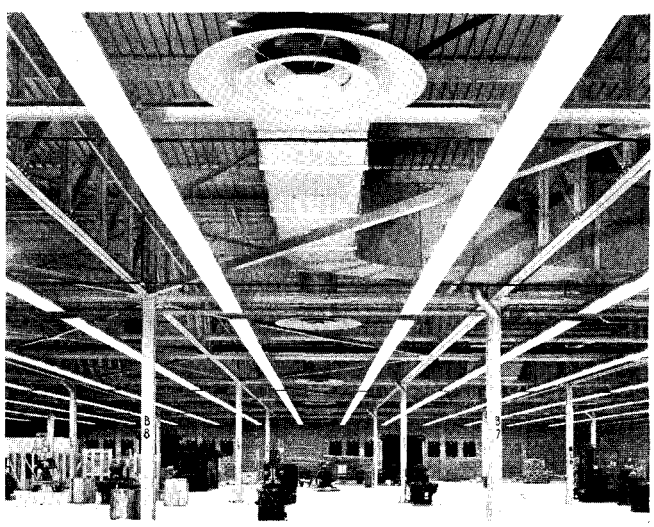
COMPLETED early enough to escape many later restrictions, this machine shop building of a huge army munitions plant sets a high standard. It is entirely windowless and completely air conditioned. A simple architectural device adequately solves the problem of a 300-ft. facade unrelieved by a single window. The decision to "black out" the building sprang originally from the fact that a monitor-type structure would be unsuitable because of the great power load of the machines to be housed. A southern location added to the heat problem. Further, the plant was intended for 24-hour operation; thus the economy of daylight was a small factor. A final factor was worker efficiency and the importance of quality workmanship. The air conditioning equipment has a capacity of 1,350 tons.

Six miles of fluorescent tubes provide high-intensity lighting

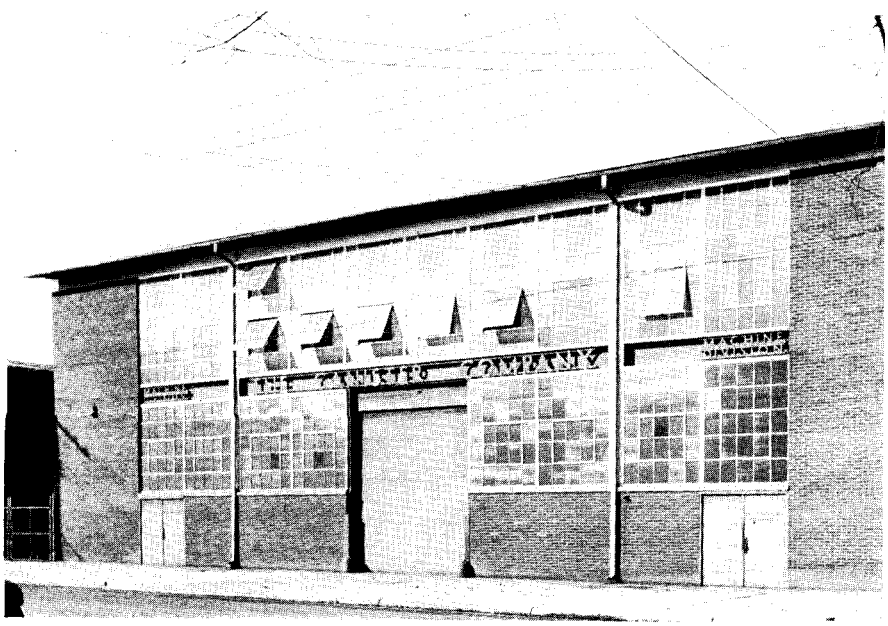


Joseph W. Molitor

Air outlets are controlled in groups of eight, with twelve zones



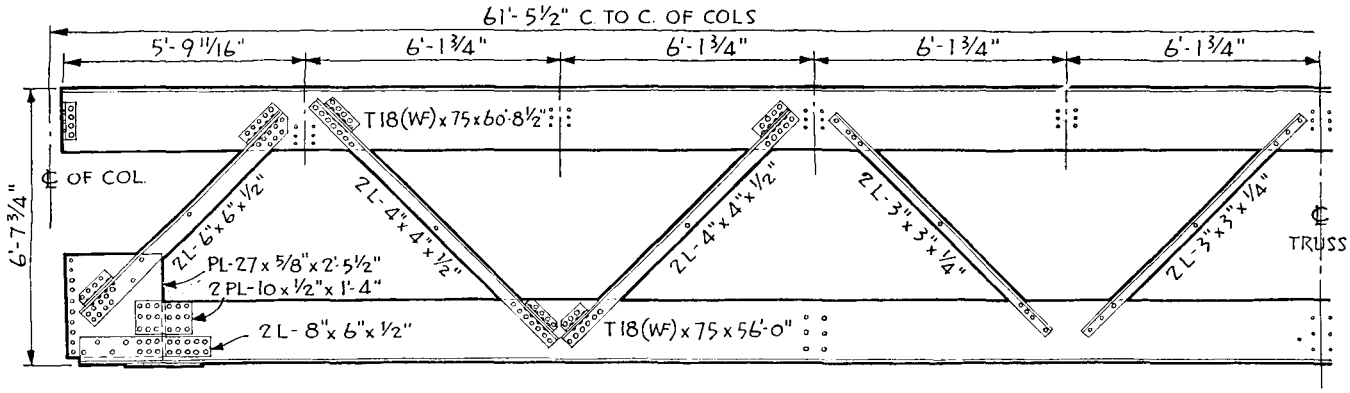
TWO-STORY PLANT FOR SMALL PLOT



MACHINE SHOP, THE CANISTER COMPANY, PHILLIPSBURG, N. J.

PAUL BEIDLER ARCHITECTS

AND ASSOCIATED ENGINEERS

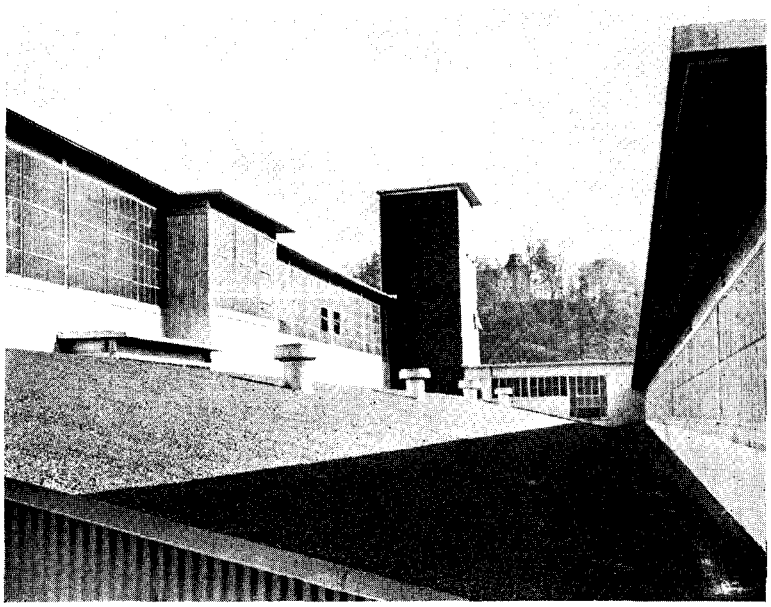


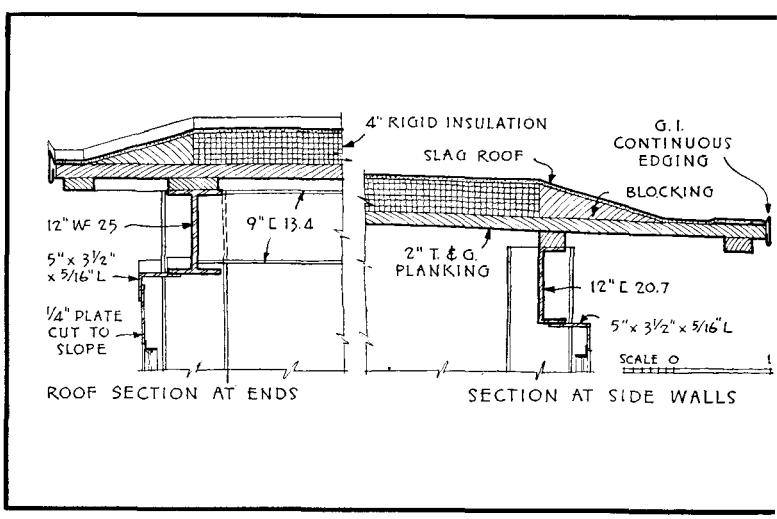
Warren type steel trusses have main chords of 18" T's (half of 36" I), eliminating gusset plates and vertical unstressed members

BECAUSE ground area was limited it was necessary to use a two-story scheme for this machine shop building for a busy manufacturing plant. Conventional materials and construction were adhered to in order to insure economy and speed of construction. Indeed the rush was such that the building was erected over an existing wooden building in which production had to continue almost undisturbed. Aside from the hurry, the principal planning problem was to whip available materials together in as simple and direct a manner as possible.

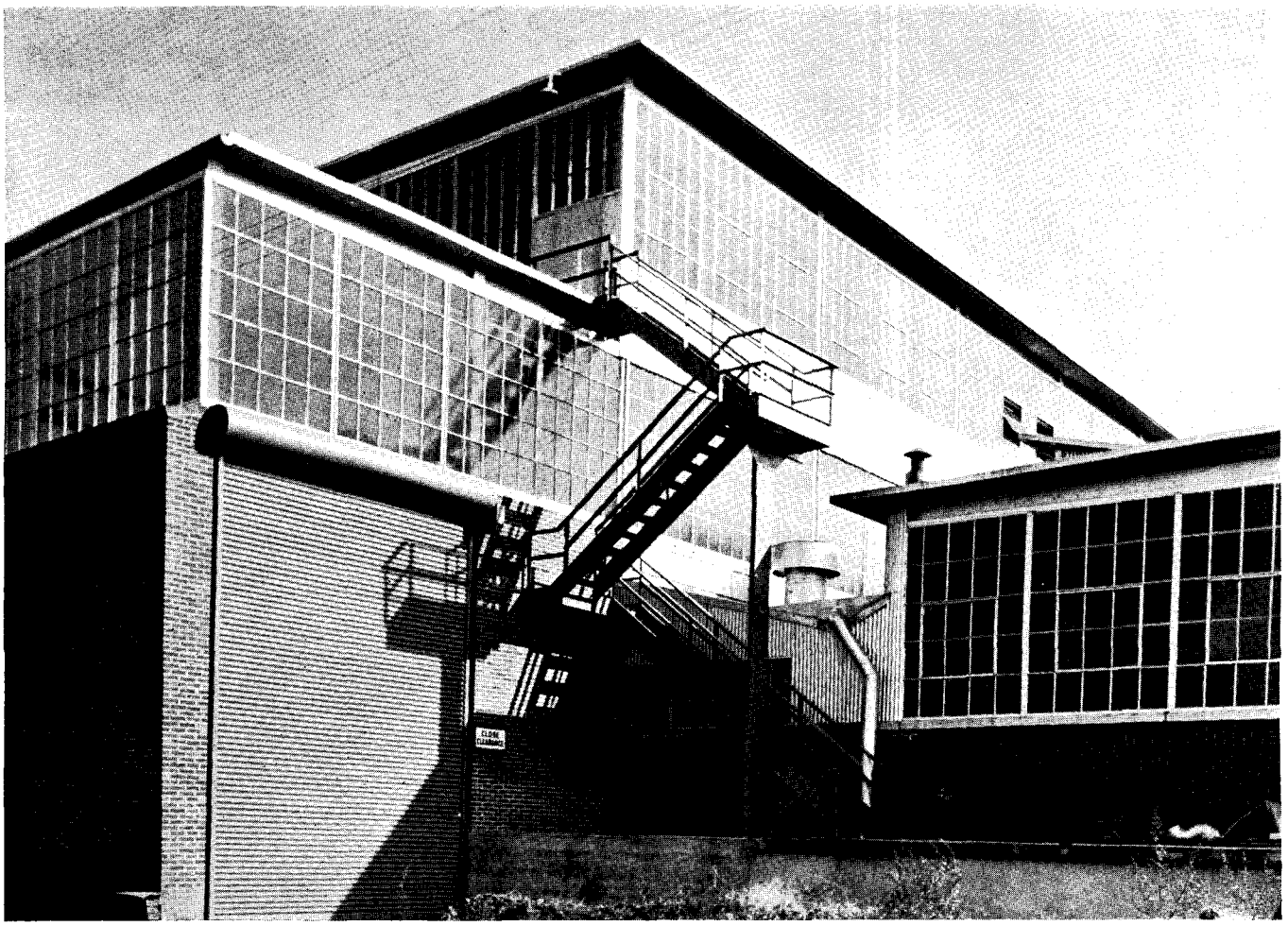
The architect insists that appearance was never considered. "If some features seem attractive," he says, "they are merely justifications of our faith in the philosophy that if a thing works well and is inherently honest, it looks well."

The structural frame has primary members of steel, secondary members of wood. The first floor is a 6-in. reinforced concrete slab; second floor is 1¼-in. maple on a 3 by 6 subfloor. Steel sash was used throughout, with fixed sash on the lower floor, ventilating sash on the upper. Positive ventilation is provided by 62-in. exhaust fans built into stock steel sash.

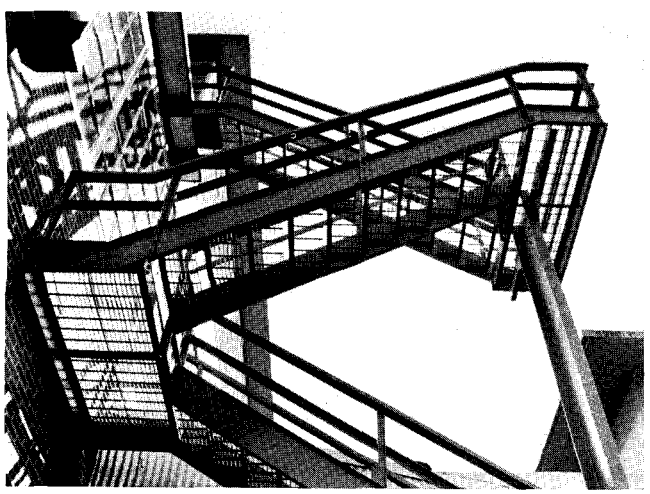




Roof construction is 2" T & G planking, laid on wooden members. There is 4" of rigid insulation, surfaced with pitch and gravel



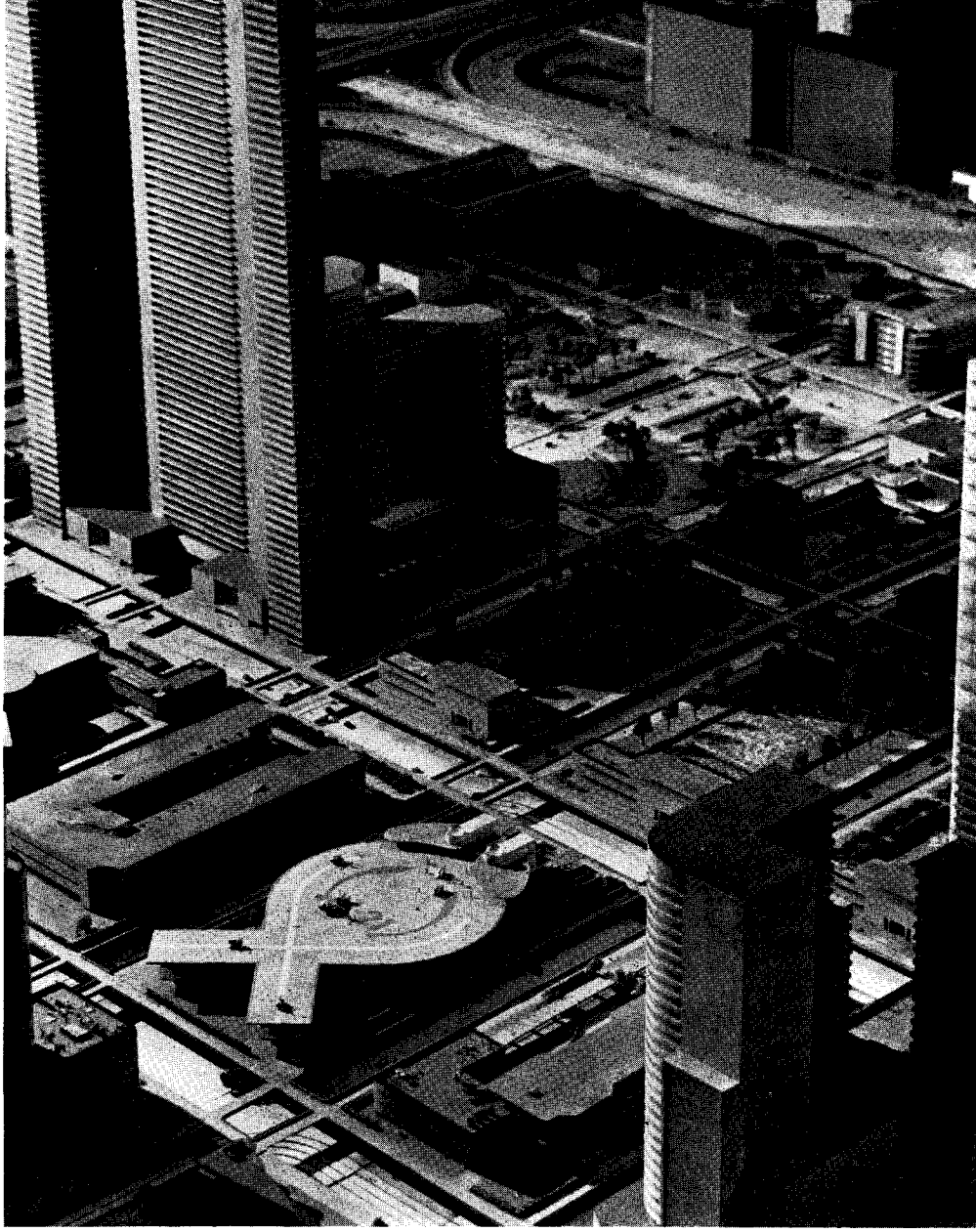
Above (and below): The railroad siding, running through the rear of the building, made it necessary to use a free standing fire escape. Note the simple method of supporting it—one channel column. Right: in the two-story scheme small parts are made in the light machine shop on the second floor and transferred by means of the elevator to the main floor for assembly and shipping. The combined stair and elevator shaft is left open, with open mesh partitions and stair treads, to get daylight into the shaft from a skylight in the roof



ARCHITECTURAL RECORD'S

BUILDING TYPES STUDY

NO. 76



Office and loft buildings in the postwar city as envisioned by Norman Bel Geddes in the Futurama, General Motors exhibit, at New York's prewar Worlds Fair

OFFICE AND LOFT BUILDINGS

CONSIDERATIONS OF THEIR PAST, PRESENT AND FUTURE

By
ELY JACQUES KAHN, F.A.I.A.

Richard Garrison

New York's midtown agglomeration of commercial buildings as seen from

COMMERCIAL CENTERS, PREWAR vs. POSTWAR

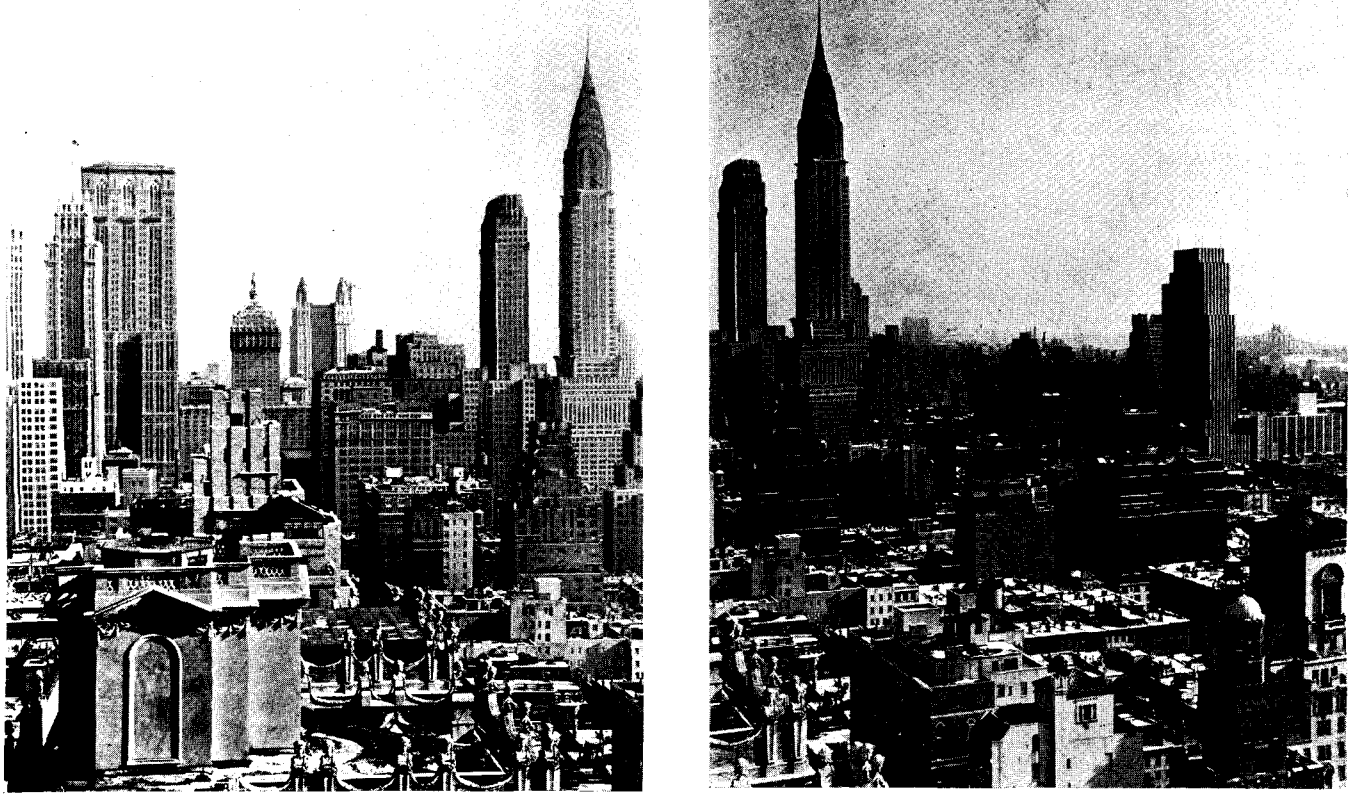
By ELY JACQUES KAHN

IT has been a long time since office buildings, loft buildings and tall structures, generally, were common matters of discussion to the architect as well as to the public. The decade of 1922 to 1932 saw the hothouse flowering of hundreds of these all over the country. How many of these were really necessary, sensible or profitable is difficult to gauge in view of present day economic factors, but certain basic deductions can be reached which may shed light on what may develop, once the war is over and people who turn to building may consider the possibilities of further development.

Various broad premises arise: Will decentralization reduce the demand for concentrated business areas where enterprises of specific types congregate? Are our big cities on the decline or are particular cities directed toward a debacle?

Such guesses, no matter what statistics are produced, can be valued against the resiliency of American business to take problems in their stride and overcome them. There will be fatalities along the way, accidents to the unwary, to the naive, to the careless builder, but this has always been the case in the usual run of business. Many factors must be considered in the light of change—the shift of industrial production to other regions while the head offices, sales departments and other branches may still remain in the big city. Questions of shipping arise—the cold balance of costs in relation to the bringing of raw materials to the city, processing them and finally distributing them. It may well happen that the balance sheet may indicate that the big city is not the place for large industry. As a matter of fact, New York has proven that conclusively. Detroit, on the other hand, is a city of large industry, acting primarily as the nerve center for the huge industries based in its environs. The answer, obviously, is that there is no flat rigid program. Every city has its own situation, its own particular geographic entity to consider, and each must cater to the requirements prescribed by changing business relationships.

If we are to envisage further building, one of the first requisites is to ascertain the fallacies of the decade that produced so many offices and loft buildings. This was essentially an era of amateurs. The war, ending in 1918, had stopped building and the surge of delayed work, the demands of foreign customers, plus a strong demand for the placing of investment funds, produced a large number of men who saw the possibilities of income in buying properties, obtaining loans and renting space at high values. By "amateurs" is meant men who lacked previous knowledge of, or experience in, building over a period of years. The adding machine became a yardstick. So many square feet of space at so much a foot indicated a generous return. The loaning institutions saw large profits in inflating size as well as costs, as long as the renting standards were maintained. As a matter of fact, they sold their securities to the public, took their profits in advance and were not too much concerned with what might happen later. That is history. The original promoters have, in most cases, lost their properties, much space is today empty, or in



the windows of Mr. Kahn's own office, looking north from 33rd Street

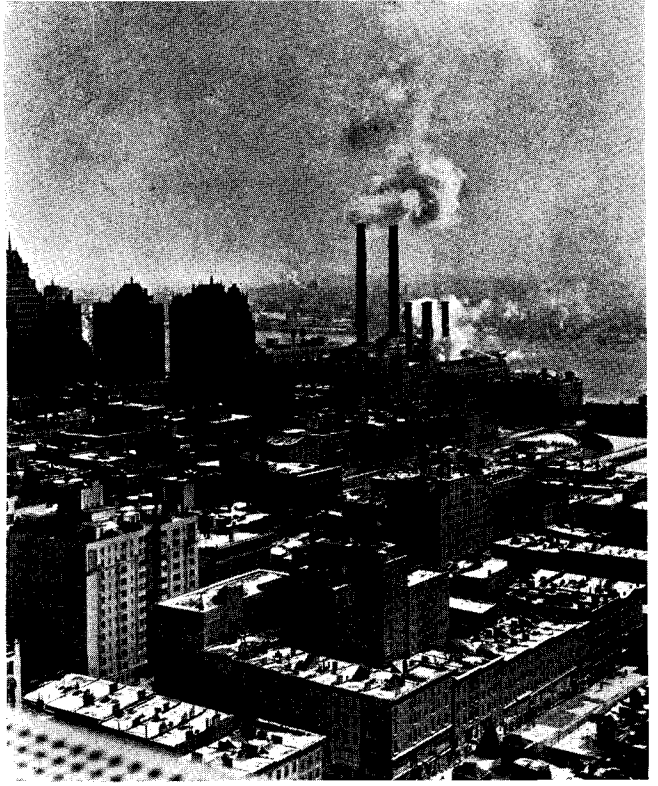
certain of the larger cities, the Government has found use for considerable areas for their emergency offices. It cannot be ignored that at no distant future (we hope) the emergency will be over and still another factor must be analyzed—what will be done with this space occupied by Federal Agencies?

The results of the twenties are evident. Frank Lloyd Wright, standing at my office window a short time ago, looked at the mass of tall buildings north of 33d Street and scornfully dismissed them all as an evidence of disease. Perhaps he was more justified than he realized for they do represent the products of the unbridled competitive spirit for gain, ignoring as they do, each other's prerogative for light and air, to say nothing of omitting the slightest consideration of those highly practical long-term factors—density, circulation, demand. This is quite aside from their outward appearance—a most fantastically unrelated collection of curiously styled creations. Some day simple, direct solutions in which money will be spent on the amenities and not on ornament, will be the order of the day.

To begin with, our speculative clients were interested in lots of varying size. One block might have a considerable number of lots (the corners naturally the most desirable), and very few of a size that could dominate a neighborhood. Strong competition in rents produced ingenious plan arrangements so that a maximum of flexibility of use would be possible. Where whole-floor tenants might be available at one moment, divided floors might be demanded at any other moment. Any plan that restricted use to a fixed pattern was dangerous. In some buildings in New York, for example, the question of light manufacturing in normal office building areas had to be considered, for although under the codes additional provisions for sprinklers, exits, etc., had to be studied, it was still held wise to be ready for a shift.

One basic thing that we have learned from the past is that the expenditure of huge sums on frippery in useless decoration does not make sense. If modern architecture has proved anything, it is that classical architecture and the accumulation of detail on high buildings, which no one beyond the workmen who installed it could even see, is of the past. Cornices of cast iron and terra cotta are among the dear departed but there still crop up experiments in expenditure that could wisely be confined to the drawing board. In the loan expert days, instructions as to design and material were to be expected. It would seem that now clean designs, in which useless trivia are excluded, emphasizing fine proportion and fine materials (not necessarily costly) could produce buildings that would not become more conflicting and discordant notes in our cities, even though our democratic tradition takes for granted an amazing juxtaposition of every variety of style and so-called taste.

One amusing residue of the days when owners took pride in naming buildings after themselves, was the fixation that money spent on efflorescence of decorative detail in the entrance halls was a necessary expense. One has only to glance at some of the older skyscrapers in New York or Chicago, to realize how much attention was paid to the approach and how little to the actual areas in constant use. Elevators of small size—sub-standard in equipment—were common. Toilet rooms—small and squeezed to the minimum as to light, air and finish, were not unusual. Service areas and freight accommodations, particularly in buildings where merchandise was handled, were sacrificed to the urgency for ground floor and basement space that could be rented. Time and again, stores that could never be disposed of were insisted upon when the space so used could sensibly have increased the actual value of the building as a whole. Blame the architects? No, for we had to battle our way through a tangle of loan experts, real estate experts and owners whose pre-occupation with profits was paramount. Actually no one really knew the answer. Many buildings went up just because *a similar one* appeared to be successful and money for loans was over-plentiful. So



much for the lush days.

Radio City has shown one powerful approach. Here, property of large size could take advantage of the zoning laws—buildings could be laid out so that all had the advantage of light and air. One mechanical plant could operate, whereas in a similar area under separate owners, there would be hundreds of individual boiler rooms, superintendents and worried owners fussing over fuel, power, elevators, machinery, etc., at an expense reflected to the tenants. Where Radio City handles its freight under one direction, realizing, of course, that it does not permit manufacturing, it still disposes of tenants' goods without interfering with normal building services. Is the answer more Radio Cities? Quite possibly, under some system of cooperation such as the Urban Re-development laws indicate, or quite bluntly, by the action of the banks or insurance companies who have had to take over many properties under foreclosure. Radio City has the enormous advantage of large scale capital that is not discouraged by the failure of a few tenants and it can provide as tenants established groups of firms that insure the stability of the neighborhood.

On the other hand, if one analyzes the garment industry that moved in one famous decade to the area south of 42d Street in New York, from Sixth Avenue to Eighth Avenue, and spreading approximately to 34th Street, one learns that there are innumerable structures of every size and height catering to the various demands of the industry. Originally it was assumed that designing, styling, manufacturing, selling and shipping would all be housed in the same area. For the convenience of buyers from all over the country there was the evident advantage of finding firms in similar lines in the same building or nearby. What was ignored was the volume of shipping that developed with merchandise coming in and finished goods going out. Protests were of little avail for, with the constant emphasis on street frontage for stores and the fear of over-generous service areas, no building in the entire zone had adequate facilities for peak loads. The result is a frantic jamming of streets with trucks that either block passage or become expensive nuisances to everyone concerned, including the public that imagines the streets are thoroughfares for normal traffic. So much for the negative side.

Having learned something from experience, we may conceivably add some more imaginative conceptions from other lands. The recent exhibition of current work in Brazil, shown at the Museum of Modern Art, presents a number of tall structures that to the conventional builder of such buildings are wildly radical. The theory that the public owns the street and might be entitled to pass under the building and have views beyond, is front page news in relation to what we have done. Conceive, for example, the possibilities of a new Sixth Avenue, which is now merely a long string of dilapidated and antedated relics that were mercifully hidden in the shadow of the old elevated structure. The removal of the El brought them into the cold light, and the depression and the war have stopped any effort to do anything really constructive. If one dare dream, how about buildings on stilts, paraphrasing one of Corbusier's pet theories—actually the arcaded principles of many historical areas? Stores could be reached under a protected space. In the middle of the blocks west of Sixth Avenue, certain green parked areas might provide breathing spaces visible from the avenue arcade and at the same time immensely improve the value of the cross streets. This requires cooperation, to be sure, but first, imagination.

Perhaps we will be able to convince owners that one hundred per cent coverage of property is not the final reason for success. Conceive of a large plot in the lower part of New York, say on any of the narrow streets in the financial district; there an owner might calmly provide a parked or sidewalked space on his own land to avoid ruining his own light and to permit his prospective tenant actually to see the property. Perhaps some of the existing buildings in this badly blighted district could be torn down, and to the surprise of the neighborhood, the values of the whole be thus improved by reducing the amount of

second rate space now prayerfully awaiting attention.

As to more precise detail, it is recognized that the heart of the office or loft building is its circulation, its elevators. The number and size of the elevators is in direct proportion to height, speed and efficiency of control systems. A building that has inadequate elevators or service is instantly below par. Dark space is always a burden. Too often, the temptation to multiply square foot areas by the number of floors creates areas that in the final analysis cannot be computed as desirable, but the owner cajoles himself into thinking that some mysterious use for storage, reception, etc., will bring all of the space into the high rental zone. There is no precise ratio between the depth of the building and the width of the street, or the adjoining buildings (present or future), yet these may radically affect rents. The upper floors, naturally, have the best light and the problem of what to do with the lower part rises too often to plague the owner. It is obvious, however, that space 28 ft. from glass usually has good light; up to 40 ft. on upper floors may be equally good.

The question of windows is an item of constant discussion. Wherever light is obstructed by neighboring buildings, the maximum window area is desirable. Especially where manufacturing takes place, light is very important. It is nonsense to suppose, however, that in every case the maximum window area is aesthetically or practically advisable. That is evident in the number of offices in multi-windowed spaces which have been built into the structures bodily with walls behind these windows, so as to bring the actual amount of light to what is comfortable and to avoid glare. The division of the normal 18 to 22 ft. column bay into three openings is not as flexible for office planning as four, depending of course on the actual dimension and the size of the windows. Experience has shown that steel windows 5 ft. or more in width are very difficult to handle, particularly by women employees.

Toilet rooms are too often tucked away as necessary evils, but their proper placing, proper finish and the provision of reasonable comfort in free space makes for greater tenant satisfaction. This does not imply extravagance, but woe betide the owner who assumes that the strict compliance with the law's minima will suffice. And he will pay in maintenance for cheap floors or cheap finish.

Air conditioning is now in people's minds as a possible necessity. The cost involved in space, maintenance and initial outlay must be balanced against such rents as may be assured, for it would be folly to burden a building with any equipment that cannot be supported. Provision can be made for each tenant to provide his own equipment, and this is not unusual.

Panel heating is still another possibility in our dream of the future office building. Running heated pipes in the floor to produce a tempered all-over distribution may well avoid the ridiculous situation so often seen in offices with radiators and exposed steam or hot water connections – the radiators are turned on and windows are left open, accompanied by colds and draughts. Cost factors once again intrude their unpleasant realities. The panel heating solution may depend on the postwar availability of pipe at reasonable figures, labor charges, etc. Electric heating is still another long range possibility, depending on similar facts.

On technical grounds, lighting is still, by and large, in the archaic tradition. It has long since been shown that glare of lighting units eventually tire the eyes and reduce efficiency. The building owner has no passionate desire to invest in superior equipment if he can sell space without it. The issue resolves itself simply into cost as against possible return, with the thought that a higher standard in competition with buildings of less advanced quality insure the investment.

One issue that is bound to be met squarely and tersely is that of the use of revolving doors. It is the experience of many that the suction of long elevator shafts has a distinct bearing on the maintenance of comfortable temperatures in the entrance halls. On the other hand, recent fire experiences where many people lost their lives in trying to escape through such exits, indicate that the Building Departments of many cities will be increasingly vigilant in buildings where other exits are not sufficient to permit egress in fire, explosion or panic situations. This is no brief against revolving doors but an emphasis on being certain that positive egress be free and separate from the additional exit facilities of the revolving doors.

In summation, future trends seem to be away from the smaller unit of tall building; the mechanical facilities duplicated in a number of such structures being out of proportion to the cost and efficiency of combined services. Buildings will be simpler in design; not so much an effort to determine a style basis but a concentration on more durable and attractive surface material and the elimination of useless detail. The placing of buildings in relation to street services and other buildings, radical as the thought may seem, will sometime prove to be an important issue if only for the preservation of neighborhood values. The present helter skelter, unrestricted principle has not worked and sooner or later some amalgam of interests or accumulation of properties will develop. Comfort, being a marketable commodity, will determine the extent to which air conditioning, modern heating and satisfactory illumination will develop. Our decade of tall buildings, while interesting and spectacular, has nevertheless shown the faults of unwise speculation. Perhaps a more sober attack on the next flurry may bring a more solid and useful result.

To the pessimist, any attempt to dream about radical changes in our city is nonsense. It might be interesting to refer to Norman Bel Geddes and his fascinating exhibit of the Futurama at the New York World's Fair in 1939. One still recalls the long lines that waited patiently for hours to see this fantastic picture of the future, and we remember quite well the last dramatic note when at the end of the show the visitors were given a solid visual representation of actual buildings, arranged in orderly fashion about what might be a grouping in days to come. Do we assume that the influence of this show was little, or that the hordes of men and women who saw it again and again are not the receptive clients of tomorrow?

It is just that variety of mass education that city planners and idealists pray for. Our difficulty as architects and planners is that we become diffident and worried when we face the individual job and the individual client, for broad planning looks hopeless. The day will come, we trust, when more Futuramas, not in staff and wall board but in steel and concrete, will stir up our imaginations to something richer and more real for places in which to live and work.

ARCHITECTURAL RECORD
TIME-SAVER STANDARDS
APRIL, 1943

OFFICE AND LOFT BUILDINGS

Planning for Flexibility • Determination of Space Requirements

First things first

Office and loft buildings are planned for investment, therefore a *business analysis* of the entire operation is first in order of procedure. The possibilities of the development of the site must be investigated, with rough schematic drawings made to determine possible rentable areas in relation to mass and height of the building, with due consideration given to the desirability of rental areas, and possible rental values per square foot. The most workable, flexible scheme, yielding the best return on a long-term investment must be chosen before proceeding.

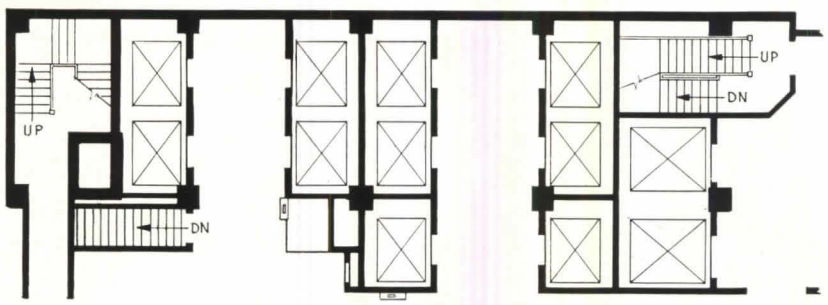
The next step in developing the chosen scheme is *consultation* with all possible experts who may contribute to the success of the undertaking, structural, mechanical, and electrical engineers, the engineering and research staffs of manufacturers of materials and equipment, and known builders or contractors familiar with the type of work. The third and final step is the development of the accepted scheme into working drawings on the basis of the latest technical developments gained through the procedure just indicated, in order that the building may be financially profitable over a long period, with minimum obsolescence, and minimum maintenance and operating costs. Attractiveness of *design* which will give tenants a sense of well being is an asset which both designer and owners must keep in mind.

Planning for flexibility of use

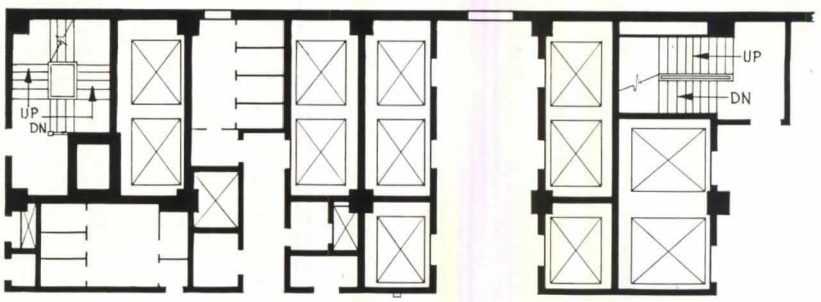
There is no clear distinction between the office, loft, or manufacturing building. The name "loft" is usually applied to a building with large open areas in the interior. Such a building may or may not have manufacturing privileges. The only essential differences between the three types are the floor loads for which they are designed, and the fact that loft and manufacturing buildings will come under more stringent laws for the protection of labor. Many buildings, generally known as "office buildings" are designed for all types of occupants.

The buildings must be planned for a variety of tenants whose specific needs cannot even be imagined at the time the building first takes form. Neighborhoods change, business practices differ throughout the years. The successful building will be designed with a maximum of flexibility so that it will serve its owners through periods of changing business fortunes. No other type of building is so dependent, for continued success, upon a constant return on the investment. Not only its size and shape, but also every detail of its construction and its maintenance should be weighed in the light of how much it will cost per sq. ft. in relation to how much the return per sq. ft. will be.

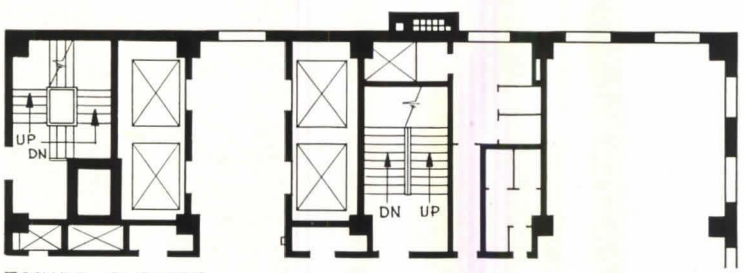
GOOD INTEGRATION OF SERVICE AREAS AT VARIOUS LEVELS IS AN IMPORTANT FACTOR OF DESIGN



FIRST FLOOR
COMPACT PLAN OF STAIRWAYS; EXPRESS, LOCAL AND FREIGHT ELEVATORS.



SECOND FLOOR
TOILETS OCCUPY MOST OF THE SPACE TAKEN UP ON THE FLOOR BELOW BY THE EXPRESS ELEVATOR LOBBY.



TOWER FLOORS
EXPRESS ELEVATOR LOBBY AGAIN APPEARS; CROSS-OVERS HAVE BROUGHT STAIRS INWARD; TOILETS FOR SMALLER FLOORS TAKE UP LESS SPACE.

Determination of space requirements

When construction of an office or loft building is contemplated, the first question that comes up is "How much space is usable and necessary?" It is exceedingly important that this factor be determined in the very beginning. If it is not, the building is likely to be in the hands of the bank at the end of a certain period of time. The architect alone cannot settle this matter. He can, however, use his abilities as coordinator to bring about a meeting of minds. Business men and real estate men must be consulted. It may well be that it is best to line up the tenants first. Shrewd investors often see that the whole enterprise is virtually underwritten before the first brick is laid. An amalgamation of interests may be desirous of making the neighborhood into a leather district, a furniture or textile center. One good building may lead the way to the development of a whole area on a grandiose scale. An unoccupied building may ruin the neighborhood for years.

OFFICE AND LOFT BUILDINGS

Rentable Area • Height • Windows • Exterior Walls

TIME-SAVER STANDARDS
APRIL, 1943

Ratio of cubage to rentable area

"The rentable or usable area in any given building depends on many factors, among the principal of which are the size and proportions of the lot, the set backs and light courts, and the space taken up by utilities. These factors determine what may be called plan efficiency, which is usually expressed by a ratio of the net usable or rentable space to the gross floor areas.

"The plan efficiency of a typical office building with offices of proper depth will usually come to about 65 per cent or 70 per cent of the gross floor area. This ratio of 70 per cent, applied to a typical office floor 11 ft. 6 in. high, shows that about 16.4 cu. ft. of building are required per sq. ft. of office area. In loft buildings this cubage may be considerably reduced, since there are no corridors and few facilities on the open undeveloped floors. Ratio may be as high as 80 per cent or 90 per cent.

"When an entire building is considered, the number of cubic feet built per square foot of rentable area will exceed the proportion given above, which is based on one floor only. Construction cubage is required for mechanical and boiler plant, elevator overruns, machinery pits, penthouses, pipe lofts, service employee's quarters, storage space, roof and miscellaneous construction, and special extra-height floors. These factors make an appreciable increase in the cubage per square foot of rentable area. Examples of office building construction demonstrate that this will vary from about 17.5 to 19 cu. ft. per sq. ft. of rentable area, depending on the building floor heights and the building size." "The Minimum Building for Varying Land Values," by W. R. Morton Keast and A. B. Randall, April 1930 ARCHITECTURAL RECORD.

Height of building

As a building increases in height the cost of all its parts does not go up in simple proportion. The "law of diminishing returns" affects the height and area. The height should not be determined until thorough consideration has been given to the following factors:

1. The additional expense of steel, including windbracing.
2. The additional expense of larger elevator machines, larger pipe and tank sizes, power lines, and the like.
3. The loss of space on intermediate and lower floors which will result from an increased number of elevators and larger service shafts.

A 12-story building in a small town may be as uneconomic as some very tall skyscrapers in large cities have proved to be.

Work for Owner vs. Work for Tenant

The tenants of the office or loft building will change, and every time a change takes place, it will be necessary to rip out parts of the interior that are not acceptable to the new tenants, and build up quarters to meet their needs. For this reason, it is best to have the owner contract for interior office space finished only with concrete floors, plastered exterior walls and columns. Elevator shafts, pipe and vent ducts and toilet rooms are also finished under the contract with the owner. Elevator lobbies are finished if the floors on which they occur are wholly or partly rented. If this is not the case, it is often wise to defer construction of the elevator lobby until the requirements of the tenant are known.

Typical floor heights

There is no fixed standard for floor heights. It is possible to have 10 ft. from floor to floor, but 11 ft. or 11 ft. 6 in. will make the space generally more salable. Some owners adopt 12 ft. as most advantageous.

A small building can have lower story height than a large one. The presence of sprinklers, and the amount of furring that is likely to take place are factors which have a bearing on height.

Height of first floor

If there are to be shops in the building it is usually wise to have the first floor 18 or 20 ft. high. This allows the stores to have mezzanines, which greatly increase their rentability. If there are no shops, the height of the first floor can be determined by considerations of its other uses or of purely design nature.

Windows

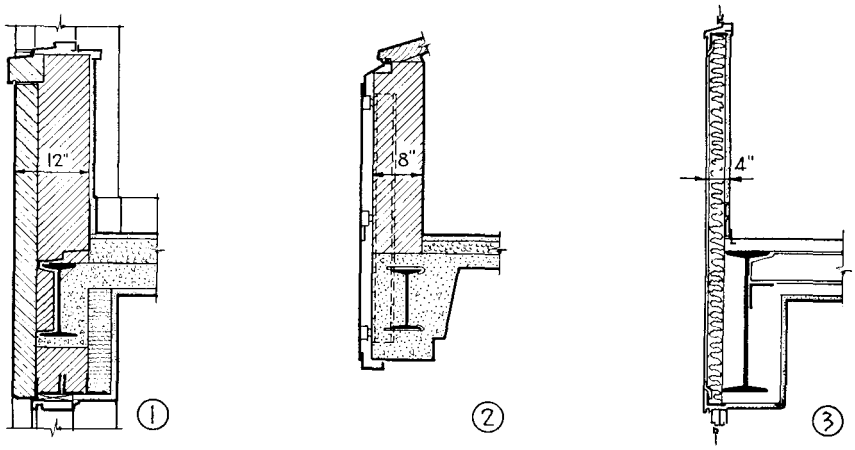
The 5 ft. window has been in general use during the past decade, but there have been complaints that it is hard to manipulate. Windows 4 ft. or 4 ft. 3 in. wide are easier to handle. The double-hung window is probably the simplest solution because it affords the best control of drafts.

Exterior walls

Wall construction can be of any impervious material which will preserve the finished plaster. Leakage of water through stone, brick, or tile should be taken care of by parging the interior with waterproofing, and furring tiles should be used as a base for all plaster.

Many building codes have insisted on 12 in. thickness for all exterior walls, 16 in. where there were piers. It is to be hoped that thinner walls, particularly thinner spandrels, will be allowed in the future.

EVOLUTION OF THE SPANDREL



1. 12 in. of masonry is a holdover from wall bearing construction. 2. Metal facing on 8 in. of brick lightens the element. 3. Insulated, light metal frame may be used when codes permit

Drawings reprinted by permission from Architectural Graphic Standards, Third Edition, by C. G. Ramsey and H. R. Sleeper, published by John Wiley & Sons, Inc.

ARCHITECTURAL RECORD
TIME-SAVER STANDARDS
APRIL, 1943

OFFICE AND LOFT BUILDINGS

Bays • Frames • Floor Slabs • Partitions • Corridors • Service Areas •

Typical bays

The spacing of columns on the exterior wall of the building is dependent largely on the possibilities of subdividing the interior space efficiently and partly on design considerations. Wall space is useful in offices and it is therefore good practice to have the glass area about 50 per cent of the outside wall area.

Average column spacing is 20 ft. by 20 ft. but examples vary from 18 by 18 to 25 by 25.

Steel frame and floor slabs

Steel is commonly accepted as the best material for the frame of a high building. The size of the columns, beams, and girders depends, of course, on the weight they support. Reinforced concrete is generally used for floor slabs. The reinforcing steel varies from small wires to large bars depending on the floor load. A slab in very common use is the 4 in. cinder concrete arch, over which there is usually 3 in. of cinder fill and 1 in. of cement dressing. Electric conduits run in the fill. If small-sized water pipes are placed there also they must be protected from the chemical action of the cinders by a cement coating or a fiber sheath. By using stone concrete and by pouring the slab and the finish monolithically, a 4 in. slab and 1 or 1½ in. finish may be used without any fill.

Partitions

The gypsum block partition, 2, 3, or 4 in. thick, has proved to be extremely economical for separating walls between tenants. Partitions in tenant space are usually of demountable steel types, cement and asbestos composition board or gypsum block. Tenant partitions and floor subdivisions are not usually a part of the building contract.

Johns-Manville

Movable partitions and acoustic ceiling

Corridors

It is best to plan corridors so that they can easily be altered at will. It is well to avoid the use of materials which may later on be hard to duplicate or to match in color. If a wainscot is used, consideration should be given to the fact that sooner or later someone will want to cut into it. Perhaps the wisest course would be to limit the trim to a base, or to use slabs of wainscot material the same width as the typical door so that substitution of one for the other would be simplified.

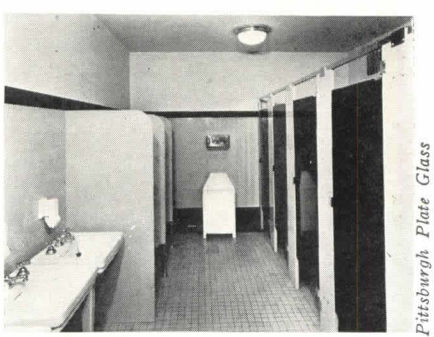
Service areas

On a typical floor of an office building the service areas (stairs, elevators, toilets and shafts) will usually occupy about 17 per cent of the total area. This percentage will increase if the range of service offered is wide and there are provisions for handling freight. To generalize, 15-20 per cent is standard.

It is good practice to make toilet rooms commodious and up to date. Many people will judge the importance of the building by the degree of comfort here offered. Materials which will cut down maintenance costs should invariably be chosen. Marble, tile, and glass pay dividends in the long run.

There is no fixed rule for determining the number of toilet fixtures in relation to the number of people they serve. The use of the building, the code of the locality, and the desires of the owners must be considered. A general approximation is 1 toilet for every 15 people, 2 lavatories for each 3 toilets.

Water pipes to serve fixtures in the rentable areas generally come up in the vent shafts along with the pipes for the toilet rooms. When a private toilet room is planned for a tenant, connection is made to it by running pipes under the ceiling beams. The ceiling must then be furred. Locating "wet columns" throughout the building is generally a gamble, since no one can know what the eventual needs of the tenants may be.



Pittsburgh Plate Glass

Glass is durable, sanitary and attractive

Lobbies

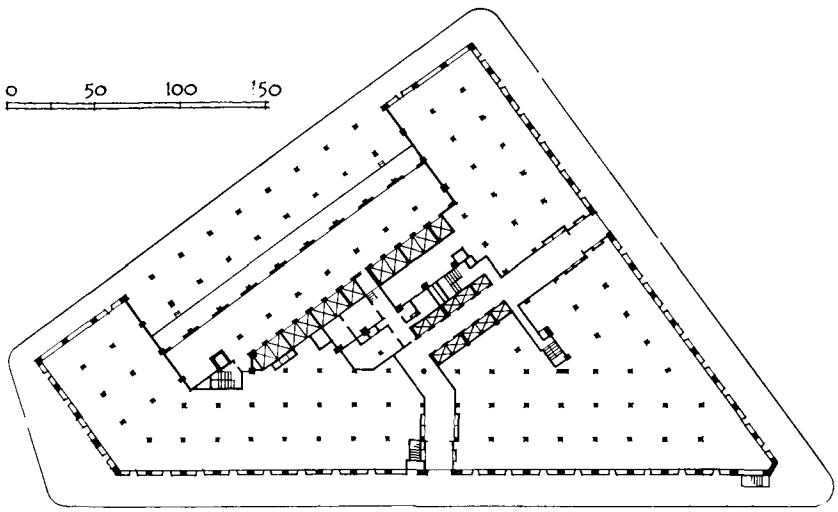
The trend of the day is to use the best of materials in public spaces, but to avoid exuberance in decorative schemes. What the tenants need most is a direct approach to the elevators. The bulletin board and information desk, if there is one, should be judiciously lighted and placed. If there are cigar or candy stores in connection with the lobbies, it is best to place them in some location where they do not become a dominant part of the plan.

Stores and restaurants

Whether or not to include stores and restaurants on the first floor of an office building, depends entirely upon the local conditions. In one location, restaurants may be popular and necessary today, entirely unwanted ten years hence. All the first floor space should be readily adaptable for varying use, to avoid loss of revenue through vacancy.

Freight handling

Provisions for handling freight and deliveries should be made in such a way that the service may operate independently of the other activities of the building. Much attention is now being paid to the matter of getting trucks off the street and freeing the sidewalks for pedestrians. Trucks should be loaded within the building itself. The Revised Zoning Resolution of the City of New York, adopted in June 1940, requires that certain types of buildings have off-street loading berths, and it is proposed to extend the requirements so that such berths will, in the future, be mandatory for all large office buildings. A freight lobby and merchandise depot, incorporated in the building, readily accessible to the street, is a good solution of the problem. In this depot, the columns should be few and far between, to allow maximum ease of turning and backing the trucks. Trailers today are 30 ft. in length and it is necessary to provide for them as well as for smaller delivery cars. The design which allows the driver to leave his car off the street is certainly desirable. Besides the area in which the cars move, there should be an adequate unloading platform raised to the level of the floor of the trucks. Steps should lead up to these platforms at intervals, so that workers will not have to vault themselves up and down, and an inclined ramp for deliveries and hand trucks will aid in getting material up to the freight elevators.



Trucks can back off street to loading platform and elevators

General utility rooms and workshops

In the basement it is well to have rooms for the superintendent of the building, and general work and storage areas for carpenters, painters, plumbers, electricians, cleaners and elevator men. Locker rooms and toilets for the building's employees are necessary. Often a rest room for elevator operators is included. Each floor should have a small janitor's closet with a slop sink and shelves.

Electric and telephone work

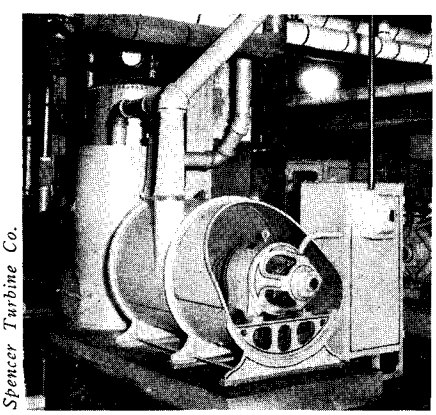
The general practice is to install in the office space two or four electric ceiling outlets per 20 by 20 ft. bay, and base outlets along the exterior wall and on each column. All other electric work comes under the head of tenant changes. On each floor there are panels containing provision for electric service to fans, bells, telephones and every other service which the tenants might conceivably need. Wiring from these panels is installed in conduit to meet the needs of the individual offices, as they are built and rented. Underfloor telephone conduit is a convenient luxury, but not a necessity.

Acoustics

Installation of acoustic material also comes in a category of tenant's work. It is not feasible to increase the overhead of the general maintenance budget by including it in the original cost.

Cleaning systems

The decision as to whether or not to install piping for vacuum cleaning depends upon the leasing policies of the owners. If they guarantee cleaning as part of the building service, they should weigh the cost and efficiency of installed vacuum pipe systems in comparison with machines which operate from base plugs.



Spencer Turbine Co.

Vacuum cleaning machinery in a basement

Lighting

Most people appraise lighting from very superficial standards. They can distinguish the difference between incandescent and fluorescent light, now that both are in common use, but that is about as far as they go. This is mainly because the human eye is a very poor light-measuring instrument. A light meter is absolutely necessary in determining the proper intensity of light for any area or type of work.

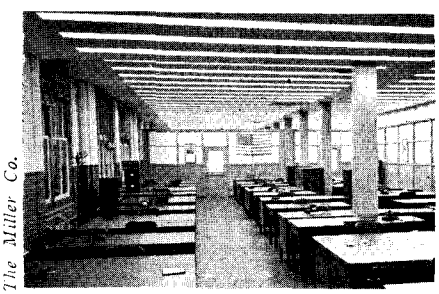
War plants have found out that 25 foot-candles are desirable for work or office space; that from 30 to 50 f.c. are not too much. If the general lighting of the room is good, the contrast between the brightly lighted spot and the surrounding area will not cause discomfort.

There is a marked trend in design toward the use of fully recessed ceiling lights in place of exposed fixtures. Long rectangular troughs of light are replacing the small spotty fixtures popular a few years ago. Such lights may be combined with cove lights directed toward the ceiling. There are so many acoustic ceilings these days that the furring space for the fixtures is often automatically provided.

Fluorescent lighting is becoming more and more popular for public, office, work and display spaces.

General Electric

Flush-mounted troffers on 6 ft. centers



The Miller Co.

Light troffers in the form of long strips

Kurt Versen Co.

Plastic luminous-bowl ceiling fixtures

OFFICE AND LOFT BUILDINGS

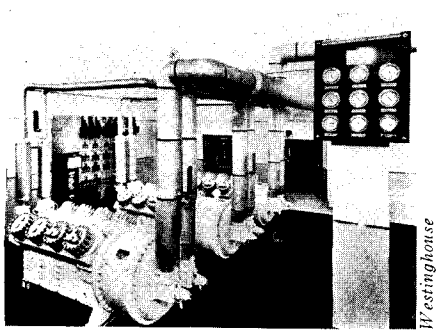
Air Conditioning • Direct Steam Heating • Sprinklers

Air conditioning

The decision as to whether or not to air condition space should depend entirely upon the relation between its cost and the additional rental expected from its installation. Air conditioned space may cost $4 a sq. ft. as against $1 a sq. ft. for ordinary office space. When air conditioning is used in office buildings it is generally limited to special parts of the building, and is most often installed by the tenant who puts his compressors and machinery in the space which he has leased. The installation will greatly increase the water load of the building. The probable amount of air conditioning needed should be considered before the building is built, and pipe sizes and source of water made commensurate with the need.

The adoption of air conditioning for the building, or for part of the space within it should depend on: 1. The physical space and utility services available. 2. The benefits to be derived from installation. 3. The cost in relation to these. In small single spaces elaborate systems are undesirable from the standpoint of initial cost. When larger areas are conditioned, the size of the equipment and the length of the ducts usually dictate subdivision of the area into zones. In large low buildings a single conditioner and fan often supply conditioned air to recirculating fans located in various zones. The same system is also applied to the tall building, which may be sectionalized vertically instead of horizontally. In the high buildings, the extent to which the vertical supply and return ducts encroach on usable space is a large factor in the design. In any building the apparatus may be located in the basement, on the intermediate floors, or near the top of the building or on the roof. A good system will be designed with a view to economy of operation and maintenance.

Success or failure of an air conditioning system may be largely due to the care with which it is installed. As few compromises as possible should be made to physical or structural limitations. The closer the machine room to the conditioned space, the less expensive is the ductwork. On the other hand, the noise and vibration of the apparatus has to be taken into account. Wherever wet apparatus is located, suitable waterproofing and drainage must be provided. Economy of space is of paramount importance. The equipment placed in space that would otherwise be rentable, should be charged as an operating cost against the system. Outdoor air intakes should be considered from a design, as well as from a mechanical standpoint. All layouts should be made with accessibility in mind. Cooling coils often have to be replaced and repaired, eliminators and filters cleaned, and there must be free access to the bearings of all moving machinery. Provision should be made for the complete removal of any part of the system that is subject to wear, deterioration, or damage.

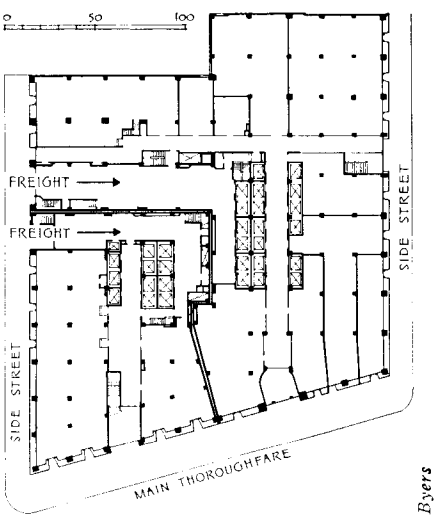


Westinghouse

Compressors for air conditioning an office

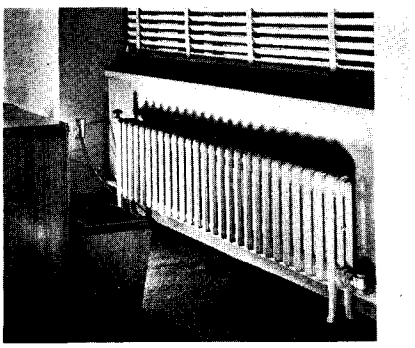
Sprinklers and fire protection

Sprinklers are required in buildings which have manufacturing privileges. They protect the goods rather than the building. Installation lowers the individual tenant's insurance rates. Water for the sprinklers comes either from the street or from tanks within the building, depending on pressure available. When it is desirable to conceal the supply pipes which run under or through the ceiling beams, a furred ceiling is placed beneath the pipes and the sprinkler heads are turned down to protrude through the plaster.



Byers

Two buildings built simultaneously by the same architect for different clients take full advantage of street frontages, keep all freight handling on one side street



American Radiator Co.

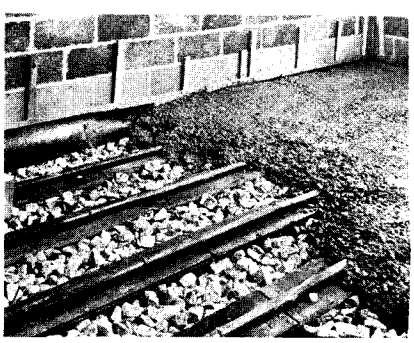
Installation of modern cast-iron radiation

Direct steam heating

Two-pipe direct steam systems are frequently used to heat office buildings. The systems usually have zone controls. Distribution should be made in such a way as to keep pipe sizes, particularly the size of the risers, small. Often steam at high pressure is taken to several locations from which distribution is made. A steam main may, for instance encircle the basement and feed risers going to the floors above, a loop around the upper stories may supply down-feed risers. The great majority of risers are near the columns in the exterior wall. Cast iron, fin type or phantom radiators are types commonly used.

Westinghouse

Office air conditioned for efficiency



A. M. Byers Co.

Pipes for panel heating run in floor fill

POSTWAR REALISM VS. ROMANCE

(Continued from page 60)

assemblies. I do not think the future of the complete standard house fully prefabricated in the factory is nearly as clear. I have seen no proof that the prefabricated war houses are better or cheaper than those built by more conventional methods. I have seen no evidence as yet that, after the Government gets out of the market as a quantity buyer, there will be sufficient buyers to furnish quantity orders in such reasonable continuity as to sustain a big national prefabricated house industry. The prefabricated house found a place for itself in the war housing program, its first opportunity for a large-scale demonstration. It may find an important place in the postwar world, but I doubt whether it will supplant the builder-built house much more quickly or completely than the cargo plane will supplant the freight car.

There may be in the postwar period somewhat less emphasis on houses of the lowest cost-classification than there was in the poverty decade. Some war industry centers will be left with surplus housing in the low-price ranges; others will be amply supplied. The deferred demand that is being built up consists to a large extent of houses to sell, with land, at $6,000 or more, the class of house now banned by war restrictions. Of the houses contemplated for postwar by prospective owner-occupants, as reported by F. W. Dodge Corporation during the last four months of 1942, 16 per cent were estimated to cost, without land, $10,000 and up; 90 per cent were estimated to cost, again without land, $5,000 or more. If, as is generally expected, national income continues in the postwar period at much higher levels than in the poverty decade, the number of families able to buy or occupy houses in the middle price ranges will be vastly larger than in the 1930's.

Assuming competent management of our affairs during the critical change-over period, and assuming ample opportunity for private enterprise and private investment, the postwar construction outlook is very good indeed. I do not look for a Utopia created by government spending or one created by high-pressure selling of novelties. I do look for broadened opportunities to put our resources and energies and our ingenuity to work for greater adventures in prosperity. This war is costing us a lot, but its successful conclusion would bring us great rewards. It would at least bring business and investment capital out of the storm cellar where they took refuge eleven years ago. This nation is refreshing its soul and recuperating its energies for great achievements. As Walter Lippmann said a short while ago, "There has come out of the nation itself, out of this people who have not been very pleased with themselves for twenty years because they were not using their faculties for great ends, a veritable explosion of national energy which will shake and shape and alter the world."

Excerpts from an address by the author before the annual convention of the Southwestern Lumbermen's Association, Kansas City, Mo.

A CORRECTION

THE RECORD extends its apologies to George H. Van Anda, photographer, for erroneously crediting Mr. Van Anda's fine photograph of St. Joseph's Church in Canaan, Conn., which appeared on page 80 of the March issue, to another source.

The ***TECO*** *Ring Connector spreads the load on a timber joint over practically the entire cross-section of the wood . . . brings the full structural strength of lumber into play.*

New Navy Blimp Hangar, 1000 feet long; 153 feet high; clear-span roof 237 feet. Timber treated for fire resistance according to Federal specifications. Trusses prefabricated by Timber Structures, Inc., Portland, Oregon.

OUR NAVY BUILDS WORLD'S GREATEST TIMBER STRUCTURE

mammoth blimp hangar was made possible by

TECO CONNECTOR ENGINEERING

Two announcements of the widest import to American engineering have just come out of Washington.

The U. S. Navy has announced that a giant blimp hangar, engineered entirely in timber, is nearing completion "somewhere in the continental United States."

The War Production Board has announced that "such a structure could not have been built of wood by ordinary methods without the use of timber connectors . . . The steel ring timber connector, which is used to increase the strength of joints in wood construction, saved more than 400,000 tons of steel for essential war production in 1942." WPB added that 2,050 tons of structural steel will be saved in this hangar alone.

In erecting this vast, multiple-truss assembly, Navy engineers have accomplished a notable achievement in modern timber connector engineering. The hangar is the latest of scores of large Navy, Army, and Maritime Commission projects built with Teco timber connectors under the revolutionary Teco system of timber engineering. It is one of *over 100,000* heavy-duty structures, of *over 600* types, built under the Teco connector system in the past few years. They include clear-span factories, bridges and trestles, towers, tanks, warehouses, docks, shipyards, and many others.

Write today for our FREE Reference Book for engineers and architects showing 45 *"Typical Designs of Timber Structures."*

TIMBER ENGINEERING COMPANY

NATIONAL MANUFACTURERS OF **TECO** TIMBER CONNECTORS AND TOOLS

WASHINGTON, D. C. **PORTLAND, OREGON**

PLASTICS . . . PRACTICALLY SPEAKING

(continued from page 59)

papier-mâché, and the rough shape of the completed article. Application of further heat and pressure in a finishing mold give it the hard, glossy surface of conventionally molded plastics, with the added strength of the fibrous material throughout its structure. Preforming is the key to the success of the process. Since the preform already has the desired shape, the final heat and pressure set up no stresses or strains in the finished product to cause failure in use. Lavatories, medicine cabinets, drainboards and even bathtubs could be pulp-molded satisfactorily.

Injection molding of thermosetting plastics. Until recently only thermoplastics could be molded by this rapid, economical process. Its adaptation to the heat-hardening group lowers the cost, and hence widens the application, of these durable, heat-resisting materials.

So far we have been dealing in certainties—materials and methods already perfected, or nearly so, and sure to be ready for the architect and engineer on V-Day. They are exciting enough, but let's take a quick look at just one idea yet to be tried.

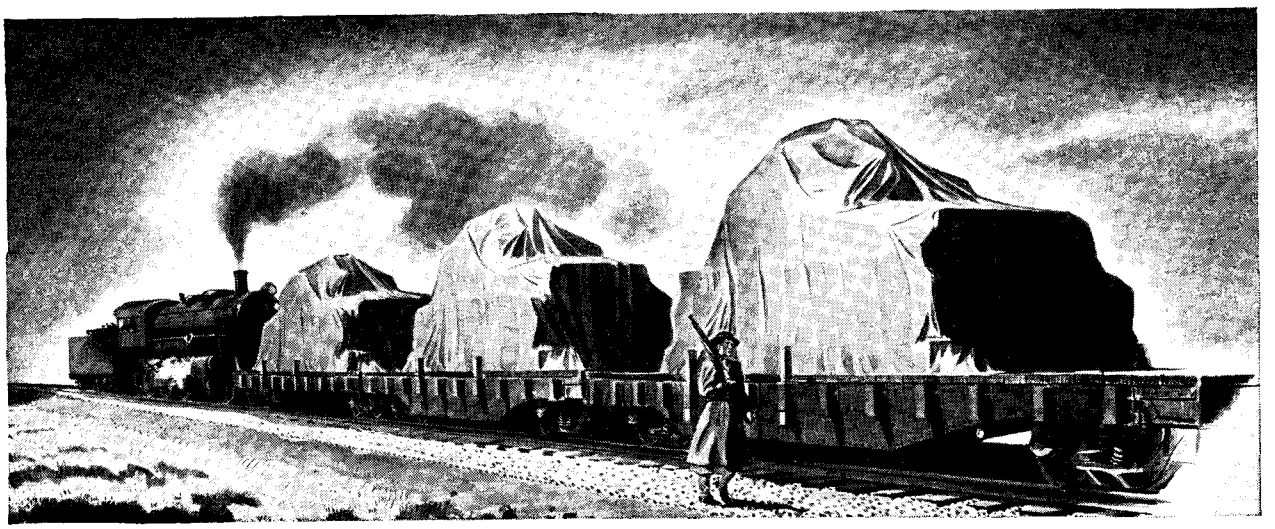
It's a window of clear plastic. Beside it on the wall is a knob. Give the knob a half-turn, and the light is cut by the same amount. The theory is simple: The window consists of two plastic sheets, one polarized vertically and the other horizontally. Rotating them slightly in opposite directions reduces or increases the light admitted.

Polarized plastic windows have been made. The observation car of the Santa Fe "Chief" is equipped with them. When will the rest of the idea be worked out? Probably when some designer of buildings asks for it. This goes for hundreds of applications for plastics in construction. They will come when the imagination and design skill of the architect and engineer are harnessed to the technical knowledge of the plastics producer.

PRINCIPAL TYPES OF PLASTICS

	THERMOPLASTIC (heat-softening)	THERMOSETTING (heat-hardening)
SYNTHETIC RESINS	Methyl methacrylate Polystyrene Polyvinyl acetal Polyvinyl acetate Polyvinyl butyral Polyvinyl chloride Polyvinyl chloride acetate Vinylidene chloride	Alkyds Aniline formaldehyde Melamine aldehyde Phenol or cresol aldehyde Urea aldehyde
CELLULOSE DERIVATIVES	Cellulose acetate Cellulose acetate butyrate Cellulose nitrate Ethyl cellulose Methyl cellulose Regenerated cellulose	
PROTEIN	Zein (corn protein) Soy bean	Casein
NATURAL PLASTICS	Bitumen Copal Rosin Rubber Shellac	Lignin

GIFT-WRAPPED FOR THE AXIS



BIGELOW WEAVERS

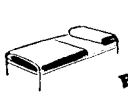
. . . by the carpet looms of Bigelow

More tanks, bombs, planes and guns are arriving in Africa, Egypt, Australia, Russia and many other parts of the world, daily. Getting them there means not only plenty of ship bottoms and protection from submarines, but also, protection from the weather.

Duck is the covering material that gets ordnance to the fronts in working order. It keeps the destructive elements from men and equipment until both are ready to give the Axis what's coming to them.

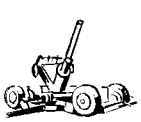
A lot of this duck is coming off the Bigelow looms that once made carpet. But that is only part of the reason why rug output is smaller. Today, 87% of Bigelow machinery has been converted to war work.

This means that, during the coming season, we cannot supply you with carpet replacements that you need and the new rug designs that you want. Our looms that made fine contract carpet are producing entirely for war.



BLANKETS

Bigelow is one of the largest producers of Army blankets.



ORDNANCE

Bigelow machine shops are humming. Machine tools and ordnance are being turned out.

DUCK

We've set our sights to double last year's production.

GUN COVERS

Fabrication of such things as tank crash pads, gun covers, etc. is a large part of our activity.

BIGELOW-SANFORD CARPET CO., INC.

140 MADISON AVENUE, NEW YORK, N. Y.

FLUSH VALVE

IN COOPERATION with WPB's effort to conserve critical copper, the Sloan Valve Company of Chicago has announced a redesigned "Victory" type flush valve in which the net copper content has been reduced from approximately 6 lb. to less than 4 oz. per valve. The new valve has a malleable iron body with a plastic sleeve inserted as a lining. This combination, the manufacturers point out, was chosen for the strength of the malleable iron and the corrosion-resistance of the plastic lining. The piston, handle, elbow flush connection, auxiliary valve and several other parts are also of plastic.

The most difficult engineering problems encountered in the conversion to less critical materials were found in the vacuum breaker. Although the functional design of the original unit was not changed, it was necessary to adapt this design to the limits of plastic injection-molding in order to evolve the all-plastic vacuum breaker. One unique feature of the new breaker is a transparent outer-shell which permits visual inspection of the flapper and its operation. (Figure 1) The Sloan Valve Co., Chicago, Ill.

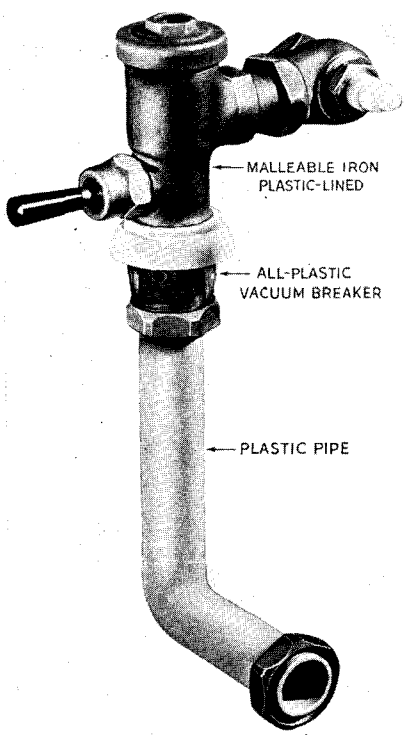


Figure 1

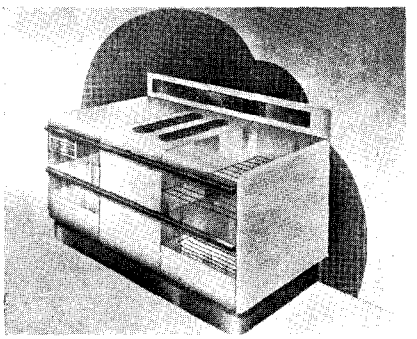


Figure 2

POSTWAR PREVIEW

DESIGNED for future production is a stove with an oven top of heat-resisting plate glass which eliminates the necessity of opening the oven door for the periodic inspection of roast, pie or cake. The oven doors, also of glass, are hinged at the bottom and drawn forward by means of a top pull-bar. At the left of the stove are the warming ovens, fronted with glass, and in the center is a commodious utility compartment. (See Figure 2) The stove is the work of Edwin R. Crick, Jr., Industrial Designer of the Pittsburgh Plate Glass Co., Ashland, Ohio.

EMERGENCY LIGHTING UNIT

REQUIRING no fixtures or wiring other than plug-in connections to the A.C. supply, the new Exide Lightguard Emergency Lighting Unit throws a beam of light 50 ft. wide a distance of 150 to 200 ft., covering an area of 7,500 sq. ft. It was designed to meet the need for a source of emergency light in war plants, arsenals, ordnance plants, shipyards, factories and other places where wartime activity has increased the potential dangers resulting from powerline failure, fires and sabotage.

The Lightguard is a self-contained unit weighing only 47 lb., easily taken wherever it is needed. It operates automatically, recharging being done by trickle charger. Illumination is provided by a sealed-glass type, pre-focused auxiliary driving lamp similar to those used on modern automobiles. The Unit measures overall 16½ in. long by 6¼ in. wide by 18 in. high. The Electric Storage Battery Co., 19th St. & Allegheny Ave., Philadelphia, Pa.

PLASTIC HINGES

PIANO-TYPE hinges of Tenite, extruded in continuous lengths, are a recent achievement in the plastics industry. Light in weight, the hinges offer new design possibilities to the makers of lightweight portable equipment, yet are said to be strong enough to be suitable for articles of relatively heavy construction.

The hinges may be cut to any desired length and are easily assembled to other materials by means of adhesives, rivets or screws. (See Figure 3) Plastic Process Co., 828 North Highland Ave., Hollywood, Cal.

Figure 3

CAMOUFLAGE COLORS

A NUMBER of camouflage colors have been developed in face brick and structural tile that eliminate the necessity of periodic painting. Conforming with the colors adopted by the United States Army, the available tones are: olive drab, loam, earth brown, earth red, field drab, sand, light green, dark green, earth yellow, jet black. The manufacturers report that these color tones will not fade, and that the lustreless surface has a high degree of resistance to staining. Hanley Co., Inc., 101 Park Ave., New York City.

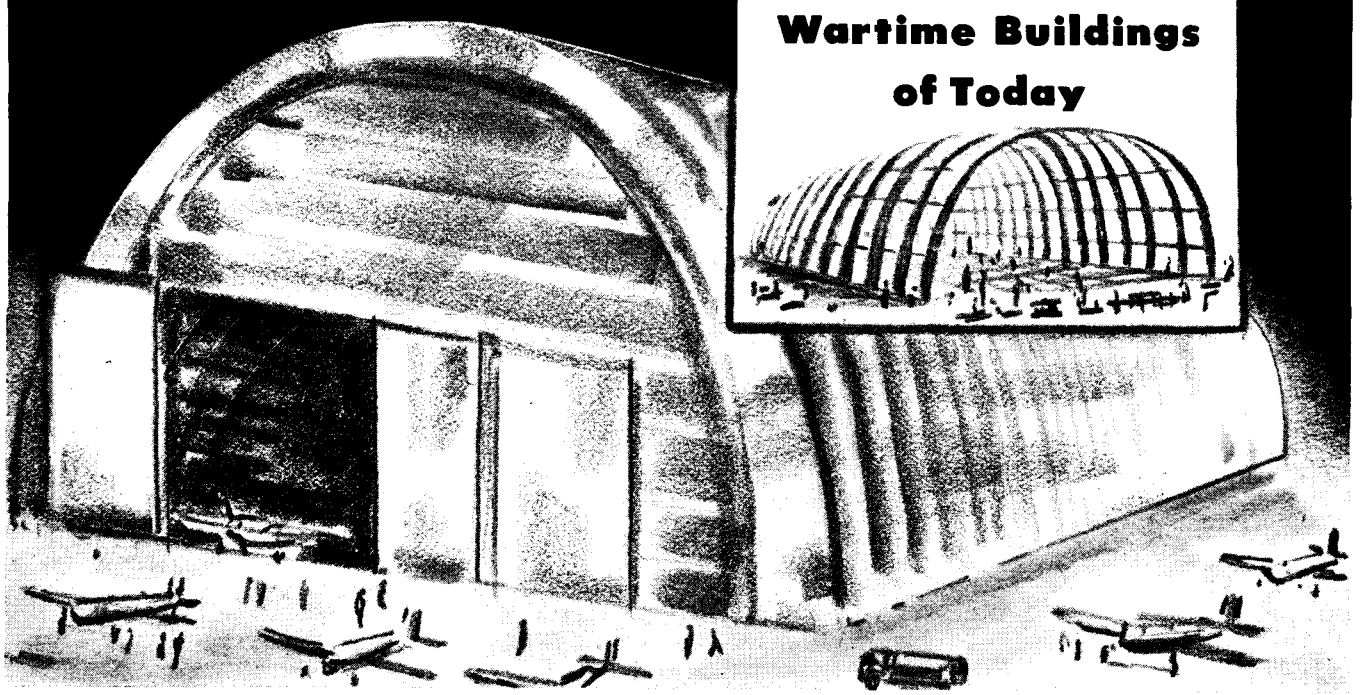
PLASTIC WIRE AND CABLE INSULATION

VINYL RESIN insulating compounds for electric wires and cables are frequently replacing the rubber insulation now

(continued on page 90)

YOUR CONSTRUCTION OF TOMORROW-

is in the Wartime Buildings of Today



WARTIME USES in hundreds of essential structures—including hangars, war plants, armories, and warehouses—are proving that wood treated with Du Pont "CZC" is more than a mere "substitute" material. On its own merits, it is now recognized as a distinctive structural material—with a wide range of applications for both emergency and postwar construction.

Today the wartime advantages of "CZC" treated wood are all-important—to take the place of structural metal and as a means of speeding up critical construction. Highly resistant to decay and termites, lumber so treated also has definite and valuable fire resistance.

"CZC" leaves lumber odorless, paintable and clean to handle—retaining all of the fabrication advantages of untreated wood. Low in first cost, "CZC" treated wood also frequently makes possible savings in transportation and fabrication time.

Whether your problem is emergency wartime construction or planning for postwar, it will pay you to learn more about this Du Pont wood preservative. Write for "Facts About Lumber Treated With Du Pont 'CZC'."

E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington, Delaware.

DU PONT
REG. U. S. PAT. OFF.

CZC

CHROMATED ZINC CHLORIDE

WOOD PRESERVATIVE

BETTER THINGS for BETTER LIVING . . . THROUGH CHEMISTRY

(continued from page 88)

unavailable because of the war. These plastics, known as vinyl copolymers, are produced in large volume and sold to electric wire and cable manufacturers and to fabricators of insulating material for conversion into insulating jacketing, sheathing and ducts. Other forms of the same materials are highly plasticized sheeting and film, usually slit into tape for easy application in insulating wire and cable splices, joints, etc.

Among the advantages claimed for the compounds are: high resistance to oxidation and moisture, to many acids and alkalis and to most solvents; a "zero burning" characteristic which prevents the spread of fire along the wire; ability to be immersed in water for long periods without injury, and to withstand contact with oils and greases. Bakelite Corp., 40 E. 42 St., New York City.

SPONGE RUBBER GASKETS

A RECENT development is a sponge rubber gasket covered with a smooth coating of natural rubber or Ameripol synthetic rubber by the extrusion process. It is available at present only for use in products of war, mainly airplanes and tanks. The sponge rubber filler is molded in slab form, slit into strips and fed through a special extruding machine to obtain the smooth covering which varies in thickness according to the customer's specifications. The B. F. Goodrich Co., Akron, Ohio.

BUILDING BOARD

AN ALL-PURPOSE building board of asbestos fiber and Portland cement is the new "Stonewall" developed to help meet the urgent need for building materials to take the place of sheet metal and various forms of lumber which are either scarce or under necessary wartime restrictions. "Stonewall" comes in standard size sheets measuring 4 by 8 ft., in three thicknesses—3/16, 1/4 and 3/8 in. It is fireproof, rustproof and verminproof, and said to be flexible and easily worked. The Ruberoid Co., 500 Fifth Ave., New York City.

PLYWOOD GARBAGE CAN

IN THE INTEREST of steel conservation a garbage receptacle of plywood has been placed on the market. Made of phenolic resin bond, it is said to be watertight, impervious to rodents and termites, and very strong. Aberdeen Wood Products Co., Inc., Aberdeen, Wash.

ALL-WOOD LOCKERS

A WARTIME locker compartment now on the market is made of pressed hard fiberboard with rabbeted connections reinforced on the inside by the use of angle braces. The finish is an olive green lacquer. Four primary types are available: single tier, single front; double tier, single front; single tier, back to back; double tier, back to back. The Sanymetal Products Co., Inc., 1705 Urbana Rd., Cleveland, Ohio.

(continued on page 92)

● There is glamor in the glass that houses the electronic miracle of fluorescent lamps. These long light sources provide the cool, shadowless, glarefree illumination that works a "charm" in speeding war production in plants all over America.

There is glamor, too, in the careful "beauty salon" treatment of glass at Sylvania. Before acceptance it undergoes 16 different inspections for possible imperfections. It is handled with gloves — to avoid possible contamination from contact with human hands. It is even washed, dried, brushed, and vacuum-cleaned in air-conditioned rooms.

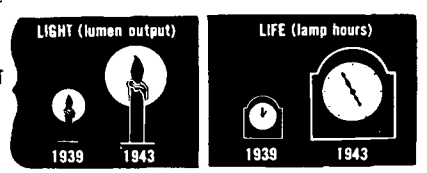
Sylvania "glamor glass," like the development of the "Mercury Bomb" method of precise mercury measurement, is a formula that conserves vital metals for war. But all the material and process changes, made continually at Sylvania, must and do step up fluorescent performance and effect important economies.*

It is because of Sylvania's many years of independent and aggressive research that fluorescent, today the best industrial lighting, is destined to light our homes, offices and stores when Victory is won.

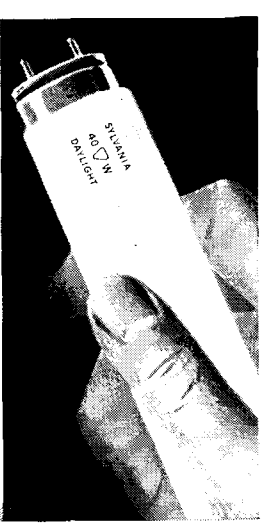
To obtain research dividends of more light output, longer life and uniform color, specify Sylvania Fluorescent Lamps — each one better than the last — for replacements.

SELL SYLVANIA AND GIVE YOUR CUSTOMERS FAR MORE LIGHT AND LIFE FOR THEIR MONEY

*Compared with 1939 a dollar invested today in Sylvania Fluorescent Lamps buys more than four times the lumen output and approximately five times the lamp life.



(Based on decreasing price and increasing efficiency and durability of Sylvania 40-Watt White Fluorescent Lamp)



SYLVANIA

ELECTRIC PRODUCTS INC.

Formerly Hygrade Sylvania Corporation
Salem, Mass.

Incandescent Lamps, Fluorescent Lamps, Fixtures and Accessories, Radio Tubes, Electronic Devices.

(continued from page 86)

BUS-DROP CABLE

A NEW BUS-DROP cable which carries power from bus bar to individual motor driven machines consists of three stranded conductors, rubber insulated and braided, and a bare stranded ground wire. These conductors are cabled with saturated jute fillers and presaturated paper and tape. Over-all is a woven cover designed to resist oil, grease, gasoline and moisture, and to be flame retarding. The cable can be hooked up easily and quickly in LVD or bus-duct systems. General Electric Co., Bridgeport, Conn.

FIRE RESISTANT COATING

A WEATHERPROOFING process called Plastipitch provides a protective coating which, according to the manufacturers, will not flame in event of fire but will only locally melt away at an extremely high temperature. *Plasti*-pitch Protected roofing, siding and other materials are said to be impervious to all ranges of climate. Coated Products Corp., P. O. Box L, Verona, Pa.

GLUING BLUEPRINTS

EXTENSIVE use of large-scale blueprints in war industries and government offices has introduced a casein-bound "paper adhesive" called P-40 Lauxein self-bonding glue, which is said to give quick, permanent adhesion, eliminating slippage of the joints. According to the manufacturers it also furnishes a glue bond which will withstand the various baths to which the jointed blueprint paper is subjected while the paper is traveling through the machine. I. F. Laucks, Inc., 911 Western, Seattle, Wash.

ROOF VENTILATORS

NEW ON THE MARKET is the Asbo round Roof Ventilator, sturdily constructed of "Felt-Cote" asbestos-protected metal, and providing for a wind velocity of 80 miles an hour. It is available in a variety of sizes and several styles of base. The same design is offered in galvanized or other suitable materials for use under certain conditions, especially those of severe exposure to heat, for which Felt-Cote is not adapted. American Steel Band Co., Pittsburgh, Pa.

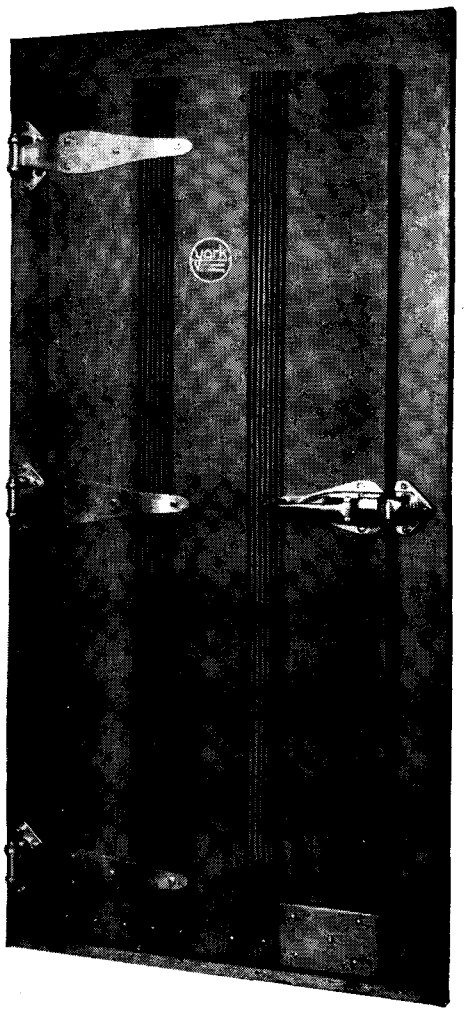
REDWOOD DATA SHEETS

A SERIES of data sheets now available offers much pertinent information on durable Redwood lumber and its utility in the solution of critical problems arising from construction or improvement of war plants under existing conditions of metal scarcities.

Illustrated with tables, drawings and pictures, the bulletins range from 2 to 16 pages. They cover the following topics: Redwood Tanks and Vats; Redwood Pipe; Mill Roofs; Built-Up Redwood Gutters and Drainpipe; Industrial Sash and Frames; Industrial Fences; Redwood Laminated Culverts; Redwood Expansion Joints; Redwood in Sewage Treatment Plants; Reservoir Roofs; California Redwood—Its Properties and Uses.

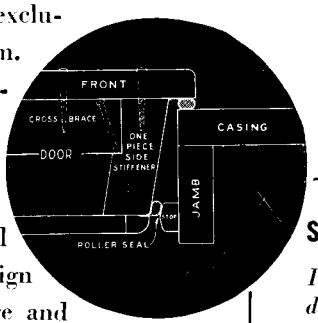
(continued on page 94)

REFRIGERATION CONSERVATION Calls for EFFICIENCY in COLD STORAGE DOORS



Streamlined in appearance and functional efficiency, specialized for every refrigeration service, York Cold Storage Doors meet all requirements *plus*.

York Cold Storage Doors are equipped with two water and grease-proof, wear resistant gaskets and the exclusive York Roller-Seal shown in the diagram. Hinges and latches are self-adjusting to maintain constant and even gasket pressure. These features insure a perfect and enduring seal.



Rugged construction includes cross bracing which prevents sagging or settling. Vertical panels not only harmonize with modern design but eliminate the accumulation of moisture and dirt common to horizontal panel construction and add further to structural strength.

Hardware, too, is streamlined and built for heavy duty service. Castings are malleable iron—other parts are steel. York's exclusive baked enamel finish uses no critical materials. It is attractive and durable. Other finishes are available on order for high priority jobs.

Special cold storage doors for unusual applications are available to your clients through a York factory branch or distributor nearby. York Ice Machinery Corporation, York, Penna.

STANDARD COOLER AND FREEZER DOORS

In addition to the standard cooler and freezer doors, York provides sharp freezer doors, metal clad doors, double doors, vestibule doors, track doors, super freezer doors, can, crate and ice passing doors, and refrigerator fronts of various types.

SIZE IN CLEAR		WALL OPENING	
Width	Height	Width	Height
1'-6"	1'-6"	1'-10-3/4"	1'-9-1/8"
2'-0"	2'-0"	2'- 1-3/4"	2'-3-1/8"
2'-0"	6'-0"	2'- 1-3/4"	6'-3-1/8"
2'-6"	2'-0"	2'-10-3/4"	2'-3-1/8"
2'-6"	3'-0"	2'-10-3/4"	3'-3-1/8"
2'-6"	3'-6"	2'-10-3/4"	3'-9-1/8"
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3'-6"	6'-6"	3'-10-3/4"	6'-9-1/8"
1'-0"	6'-6"	1'- 1-3/4"	6'-9-1/8"
1'-6"	6'-6"	1'-10-3/4"	6'-9-1/8"
5'-0"	6'-6"	5'- 1-3/4"	6'-9-1/8"

YORK REFRIGERATION AND AIR CONDITIONING FOR WAR

York refrigeration air conditioning

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

FOR BETTER BUILDING

(continued from page 92)

Any one or all of the Data Sheets may be obtained from the California Redwood Association, 405 Montgomery St., San Francisco, Cal.

MINERAL WOOL STANDARD

THE NATIONAL BUREAU of Standards, U. S. Department of Commerce, in cooperation with the Industrial Mineral Wool Institute, has announced the establishment of Commercial Standard CS 105-43, Mineral Wool; Loose, Granulated or Felted Form, in Low-Temperature Installations.

The Standard covers both cold storage area and pipe line mineral wool insulation. Based on extensive research by fully qualified engineers comprising the Institute's Specifications Committee, it also includes recommendations by engineers of the refrigeration field generally.

CORKBOARD INSULATION

THE ARMSTRONG CORK CO., has announced that WPB Order No. M-8A, as amended February 20, now permits cork to be used for roof insulation, for the insulation of air conditioning equipment, and all other non-war purposes previously banned under the mandatory priority control placed in effect by WPB in June, 1941.

Sloane C. Martin, Manager of the Industrial Insulation Department of Armstrong's Building Materials Division, explains that the new order does not end the allocation system, but that monthly allocations of cork appear to be adequate for all military and civilian needs for corkboard insulation and for cork covering to be used on cold lines.

A CORRECTION

IN THE February issue of ARCHITECTURAL RECORD (p. 86) this department reproduced a photograph of a new Westinghouse Electric Manufacturing Company building. The photograph illustrates the Z-D system of construction as developed and engineered by the Roberts and Schaefer Company of Chicago. Unfortunately, the story received with the photograph describes a different system of construction which was used in another new Westinghouse building.

The Z-D system was described in detail in an earlier issue of ARCHITECTURAL RECORD (Dec. 1942, pp. 62-63).

(continued on page 96)

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..... AR 4-43

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

FOR BETTER BUILDING

(continued from page 94)

EMULSION OIL PAINT

ESPECIALLY DESIGNED for use over wallpaper is "Speed-Easy," a newly introduced resin and oil emulsion paint in paste form that is thinned with water. A single coat usually is adequate, the manufacturer reports, and the film is dry inside of an hour. E. I. du Pont de Nemours & Co. (Inc.), Wilmington, Del.

GLASS REFLECTORS

TO CONSERVE aluminum for war uses, mirror-glass reflectors now are being used in yard lights for industrial plants. These reflectors, interchangeable with the aluminum units, have silver backing and cast iron hoods, and are said to increase light output by about 10 per cent. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

SYNTHETIC REPAIR COMPOUND

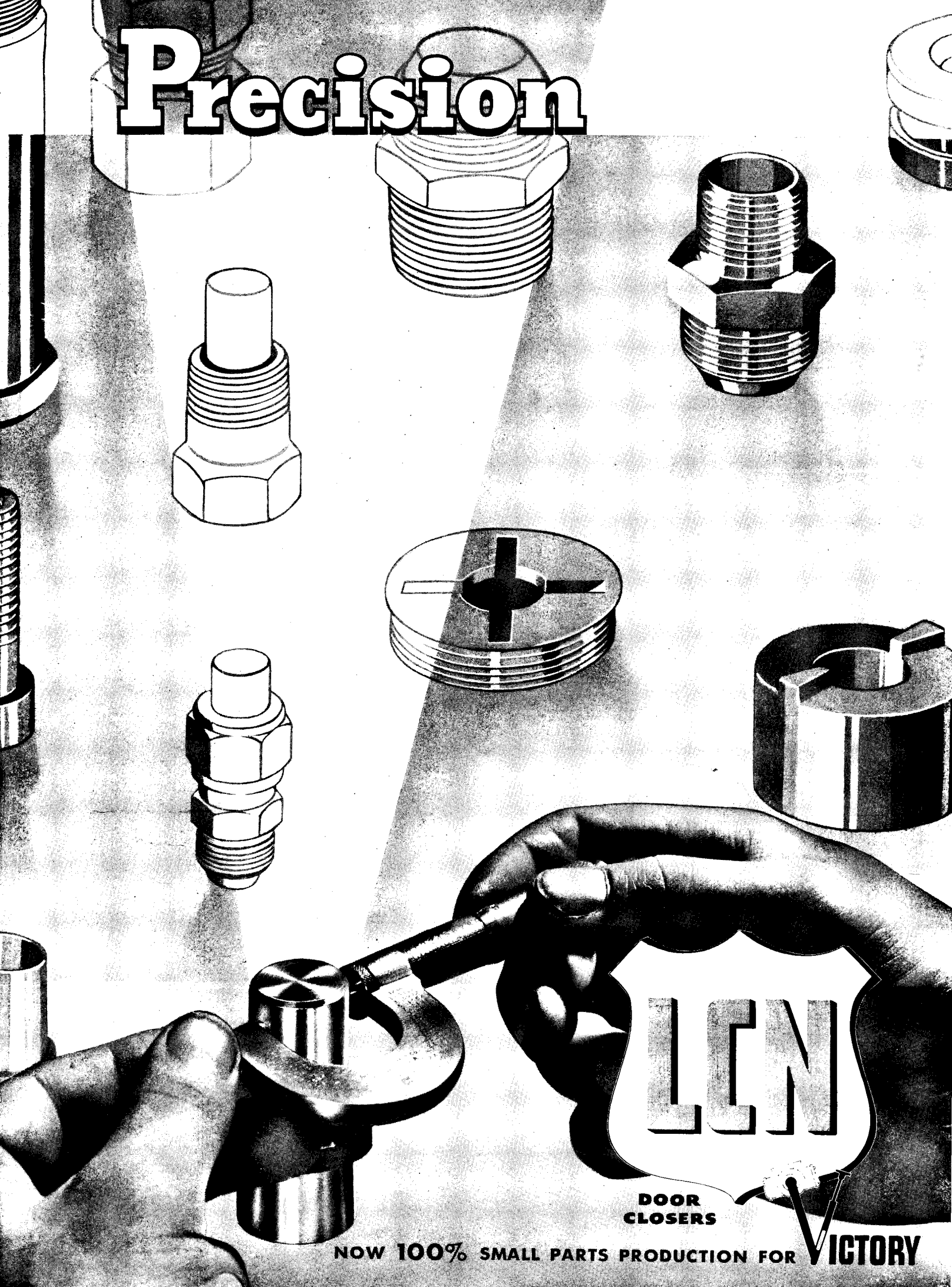
RECENTLY developed is a repair and resurfacing compound said to have a high compressive strength and to stand up under heaviest floor loads. This resilient finish, the manufacturer states, can shock loads, and bonds to concrete. Can be used on wood, concrete and other surfaces. Central Paint & Varnish Works, Brooklyn, N. Y.

WOOD SASH

OF white pine, toxic treated and water repellent, a new projected wood sash for old and new construction is announced, obtainable in standard units with glass sizes reduced to maintain standard steel opening sizes. It is also available with full size glass and a corresponding increase in opening dimensions. Rolscreen Company, Pella, Iowa.

PLYWOOD PANELS

FIR plywood panels have been developed as a substitute for critical metal in factory toilet partitions, washrooms and dressing rooms. Two types: one with metal used only for hardware; the other with metal posts and headrail. On the latter type the plywood panels can be replaced with metal panels when these are available. Milwaukee Stamping Company, 814-P S. 72nd St., Wilwaukee, Wis.


Precision
LCN
DOOR CLOSERS
NOW 100% SMALL PARTS PRODUCTION FOR VICTORY

THE RECORD REPORTS

WHO ◆ WHAT ◆ WHEN
WHERE ◆ WHY ◆ HOW

(continued from page 16)

WORK CAMP FOR ARCHITECTURAL STUDENTS

For the third consecutive season, Black Mountain College, Black Mountain, N. C., will conduct a summer work camp for students of architecture. The purpose of the camp is to supplement drafting board and classroom instruction with practical field experience in construction. Either or both of the two four-week sessions in July and August may be attended. The program of instruction will include construction work on buildings, field surveying, masonry, carpentry, cabinet work, building supervision by a method of selecting job captains, and some specialized crafts such as electric wiring, plumbing and heating installation. There will also be talks and discussion on new materials, economical construction and on postwar planning. Direction of instruction is under A. Lawrence Kocher, architect and authority on new materials and new construction methods. He is assisted by Anatole Kopp, a graduate in architecture from Massachusetts Institute of Technology, and by Charles Godfrey, an experienced builder and contractor of Black Mountain.

Application blanks and further information may be had from the Secretary of the College.

OPPORTUNITY FOR ENGINEERS

The Army Corps of Engineers has announced a special recruiting drive for the enlistment of technicians for voluntary induction as skilled specialists to be assigned to engineer troop units. The plan, designed to appeal to trained equipment operators who have been working as civilians on engineering and construction projects, calls for recruitment of 9,000 specialists a month. There are no age restrictions: all men over 18 who qualify in any one of 75 listed technical occupations will be accepted.

ENGINEERS COUNCIL FOR PROFESSIONAL DEVELOPMENT

Interesting and useful reference material on what engineers are doing in selecting and training new personnel for the profession and in elevating the status of engineers in general is contained in the tenth annual report of Engineers' Council for Professional Development.

Included in the report is a list of engineering curricula approved by the Council as of October 18, 1942—before the recently announced Army and Navy college training programs became operative. A total of 551 curricula, at 131 institutions, are on the approved list.

A.S.T.M. STANDARDS INDEX

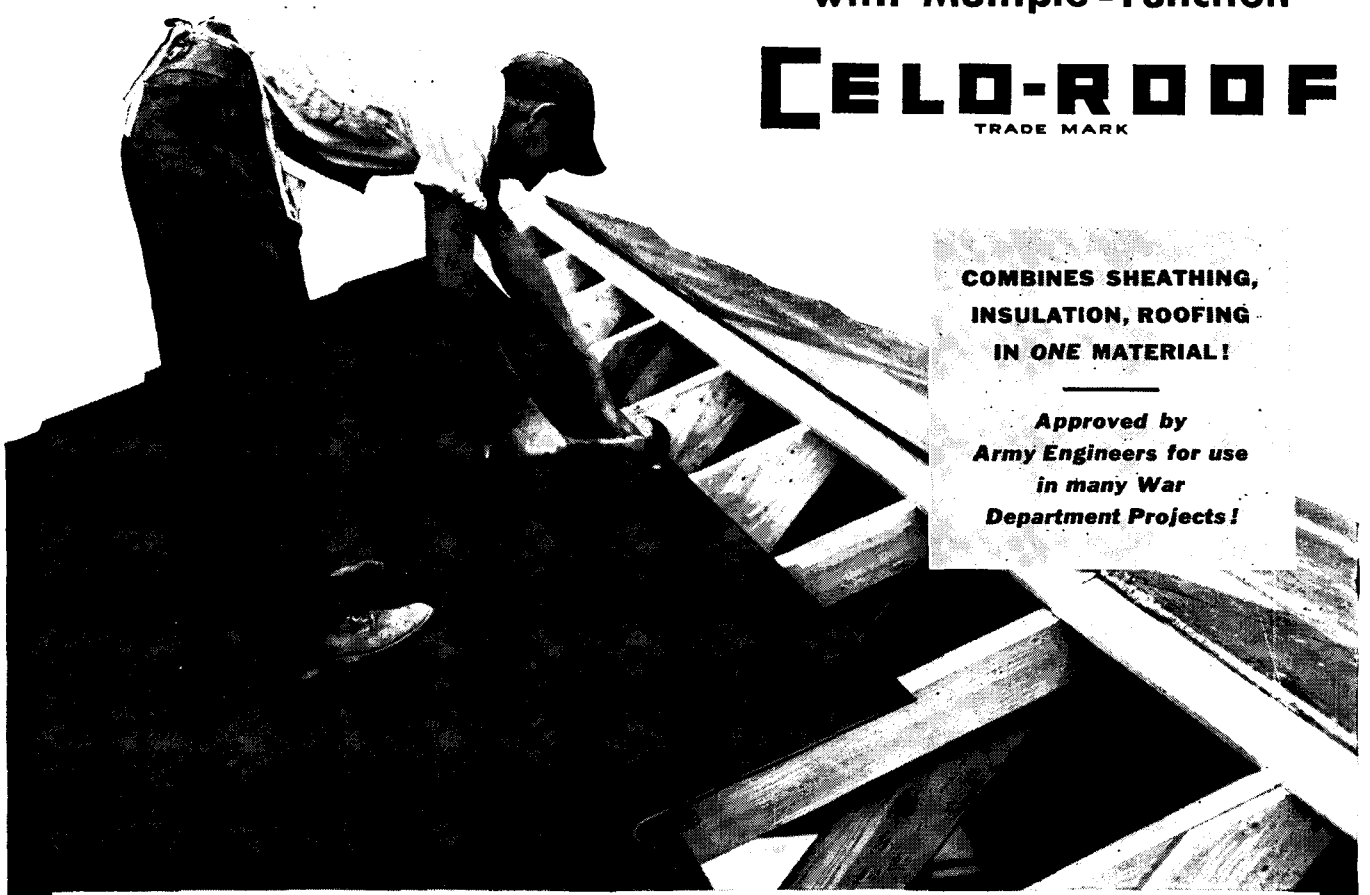
The American Society for Testing Materials has just released its "Index to A.S.T.M. Standards, including Tentative Standards," as of Dec. 1942. The Index is an adjunct to the 1942 Book of Standards. Copies of the publication are furnished without charge on written request to A.S.T.M. Headquarters, 260 S. Broad St., Philadelphia, Pa.

NOW AVAILABLE! The Greatest Roofing Improvement in Years!

SAVE CRITICAL MATERIALS—TIME—LABOR

with Multiple-Function

CELO-ROOF
TRADE MARK



COMBINES SHEATHING, INSULATION, ROOFING IN *ONE* MATERIAL!

Approved by Army Engineers for use in many War Department Projects!

Used on Housing Projects, Barracks, Hospitals, Industrial Plants!

CELO-ROOF combines sheathing, insulation, and roofing. It consists of a vapor-sealed Celotex cane fibre core surfaced with a mineral-surfaced roofing, carrying Fire Underwriters Class C label. A beveled wedge cleat, factory-applied on the under side of each unit, provides a tight, rigid, interlocking joint. Each unit is nailed directly to the rafters and eliminates the need for wood sheathing or other types of boards or strips. It saves time, labor, and critical lumber and nails.

Buildings roofed with Celo-Roof are easy to heat, conserve fuel, keep warmer in winter and cooler in summer. And because Celo-Roof is a full inch thick at the butt, it produces a natural shadow line effect, beautiful to look at and giving a true impression of the ruggedness and durability of this new kind of roof.

Celo-Roof is now specified and being used on many important housing developments, as well as on many War Department projects. Barracks, hospitals, industrial buildings and warehouses can be completed faster when Celo-Roof is used. For the present Celo-Roof is not available for individual houses. Get complete information now!

CELOTEX
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ROOFING • INSULATING BOARD
ROCK WOOL • GYPSUM WALLBOARD • LATH
PLASTER • ACOUSTICAL PRODUCTS

THE CELOTEX CORPORATION • CHICAGO

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THE CELOTEX CORPORATION, Chicago

Please send complete information on Celotex Insulating Celo-Roof Construction.

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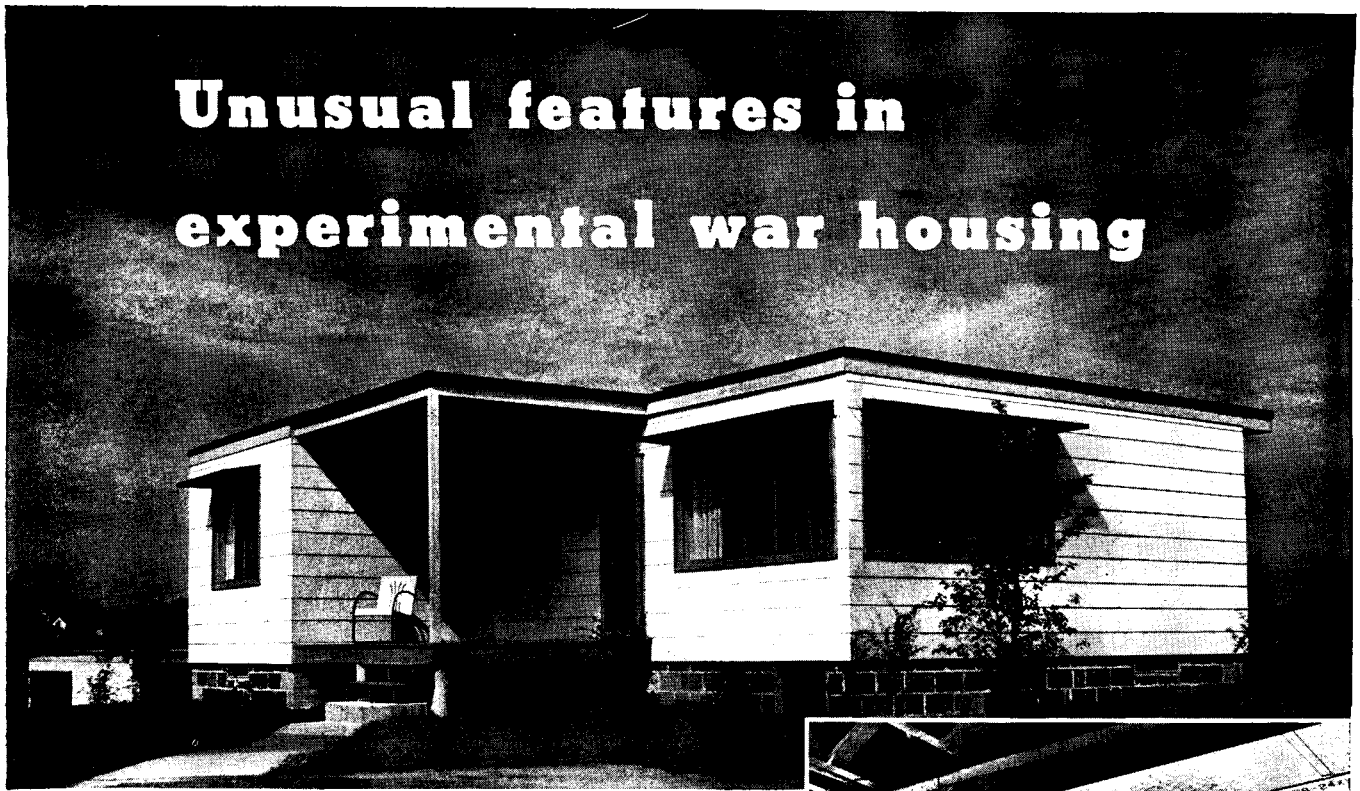
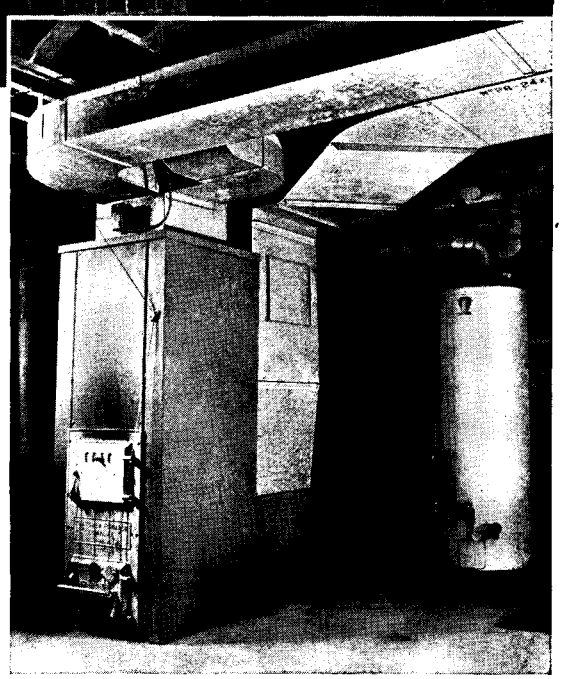
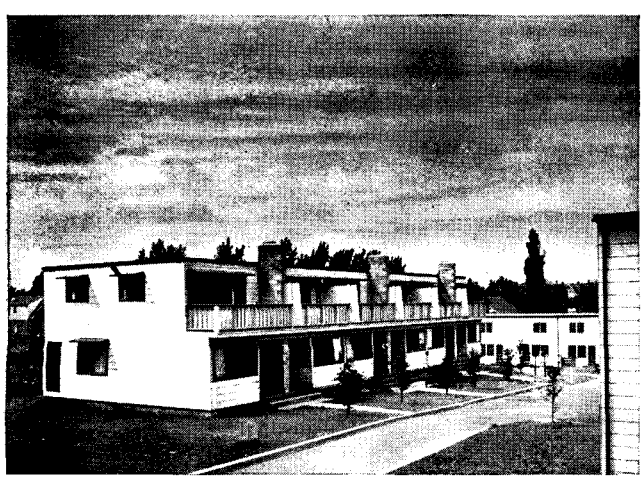
Unusual features in experimental war housing

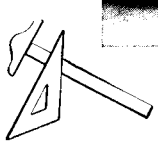




At Parkridge, a group of 168 units of a 750-house program for an Eastern industrial center, the architect was given a free hand in designing four experimental units, construction to cost $3000 each. The unit above, a one-story, free-standing house with two bedrooms and inside bath, differs radically in both plan and structure from the others. The utilities section—with ducts of Bethlehem Galvanized Steel Sheets and Beth-Co-Weld Pipe used for water supply—is concentrated in the center for free circulation and increased flexibility of use.

Below is another of the units. Living, dining and kitchen areas are merged into one large space. Note the screened porch recessed in the rear. The two bedrooms are divided by a series of three demountable prefabricated closets, bolted together. Thus, the size of either bedroom can be changed merely by moving the closets. All units have pressed fibre-board floors and horizontally-sliding wood windows of such size that more than 50 per cent of the outside wall area is window space.





Architects: Antonin Raymond, Edwin Schruers, Associate.
Contractors: Christiansen and LaFountain.

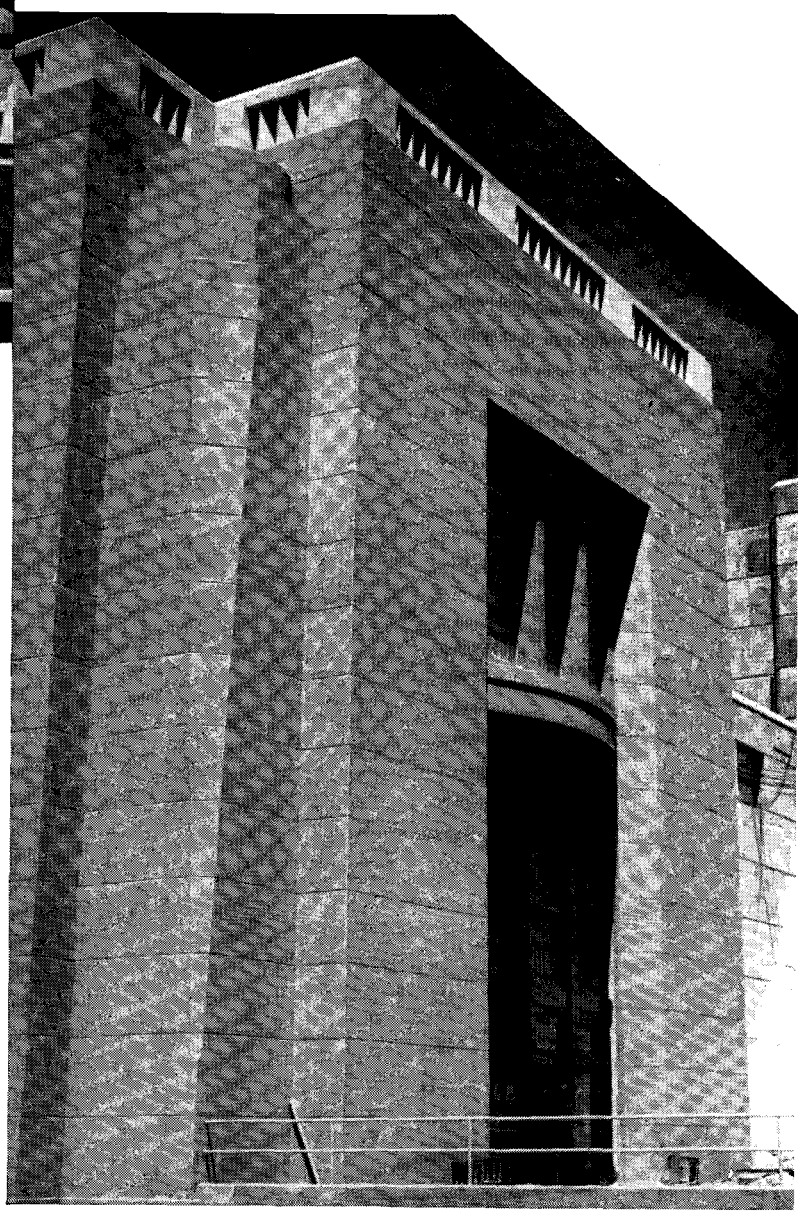
Above. All four experimental units are well heated by individually coal-fired, forced-air heating systems located in the basements which extend beneath only a portion of the floor area. All air ducts were made of tightly-galvanized, easy-forming Bethlehem sheets. For the water supply the architects specified Beth-Co-Weld Pipe, made by the continuous-weld process for greater strength and uniformity.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

Concrete provides rugged strength *for* war structures

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



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.

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. A4-8, 33 W. Grand Ave., Chicago, Ill.

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

MAKING NOISE A "MILITARY SECRET"

In the new Pentagon Building, Washington, D. C.

HUSHED—IS THE NOISE OF 30,000 WAR PLANNERS WITH SABINITE "M"

In this nerve center of global war activity, housing 30,000 people, noise is reduced by Sabinite "M", a new acoustical finish. There were 250,000 square yards of this material used to spread a blanket-of-quiet through this mammoth building—the largest single job of acoustical plastering in the world.

Again U·S·G leads the way with a new development in acoustical finish that's far ahead of the times. Sabinite "M" opens up new possibilities of sound quieting combined with architectural beauty and flexibility of use. It trowels easily to a smooth, uniform decorative finish. Sabinite "M" has a light reflectivity up to 70%. No special plastering skill or tools are required in applying. It can be easily and quickly redecorated with U·S·G Texolite water-thinned paints.

U·S·G ALWAYS THE LEADER IN PLASTER PROGRESS

USG

UNITED STATES GYPSUM

300 West Adams Street • Chicago, Illinois

This famous trademark identifies products of the United States Gypsum Company—where for 40 years research has developed better, safer building materials.

PLASTER • LATH • WALLBOARD • INSULATION • ROOFING • PAINT

An Architect Re-states

some of the normal-era fundamental advantages of

OIL BURNING SYSTEMS

George G. Miller, a well-known New York architect, is an authority on housing with a long list of fine apartment houses to his credit, among which is a large housing development for 200 families now being planned in Bridgeport, Conn., also one of the largest apartment houses in the Bronx located at University Avenue and Kingsbridge Road.

He has been a consistent user of Petro Systems and among the outstanding modern apartment houses for which he has specified Petro are those located at 50 East 191st Street, Bronx; 311 East 55th Street, New York; and Queens Boulevard and 76th Road, Queens. Based on long experience, Mr. Miller finds that,

"Petro provides the clean, quiet, efficient oil heating system which is required by those who live in apartment houses. Owners find, too, that overhead is cut down because a janitor is not needed to check an oil burner, and in these days of janitor shortage this is extremely important.

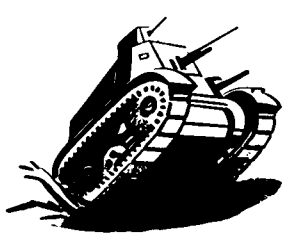
"For the duration we are compelled to look to postwar apartment building when Petro Systems again will be logical equipment to use."

Practically all recent work and discussion in all industries has been dominated by war conditions and concerned chiefly with war operations.

Petro Oil Burning systems successful meeting of overloads and other handicaps of war production has had frequent comment and commendation.

Mr. Miller's remarks, above, serve to re-focus attention on the basis for this good war record. It is the excellent design, manufacture and application of Petro to normal-time uses which made possible the plus-values Petro Systems have delivered in war-time.

And when normal construction and modernization is again possible, the demand for reliably efficient oil burning systems will be generously met by Petro equipment.



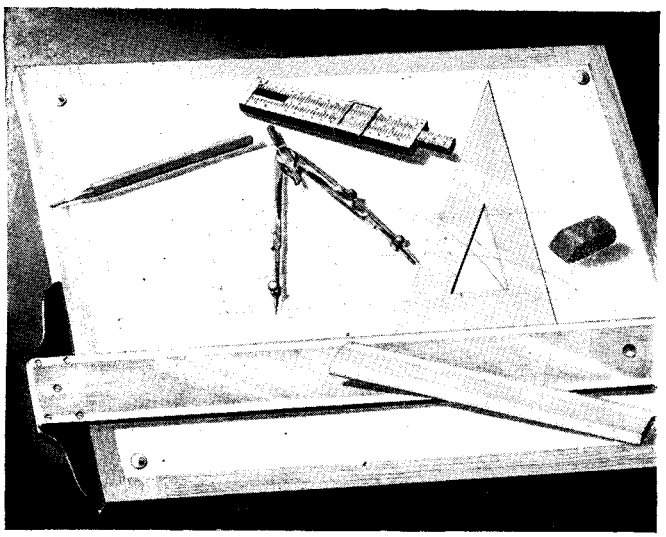
OIL IS AMMUNITION
USE IT WISELY

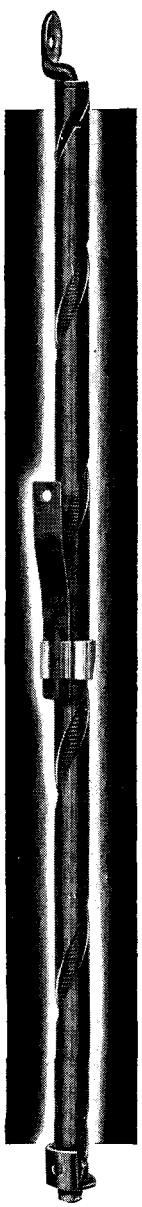
Full data on Petro Industrial Burners are in Sweet's—or Domestic Engineering—catalog files, or we will gladly send copies on request.

PETRO
Cuts Steam Costs

PETROLEUM HEAT AND POWER COMPANY

STAMFORD ***—Makers of good Oil Burning Equipment since 1903—*** **CONNECTICUT**





Where Inspiration *is Born!*

Inspiration and inventive genius, when translated into workable plans, spell progress. And, progress is the onward march of ideas which make for higher standards.

The Grand Rapids Invisible Sash Balance, for example, was a definitely progressive step in the development of window sash hardware. It was conceived and designed to operate smoothly and dependably under varying climatic conditions, to be quickly and easily installed, and to save time and money. That it represented marked advancement and filled a definite need has been proved by its use in thousands of homes and extensive defense housing projects.

Sold now only on priority, prompt delivery assured, the Grand Rapids Invisible Sash Balance will not be available for widespread civilian use as long as the Grand Rapids Hardware Company is engaged in war work.

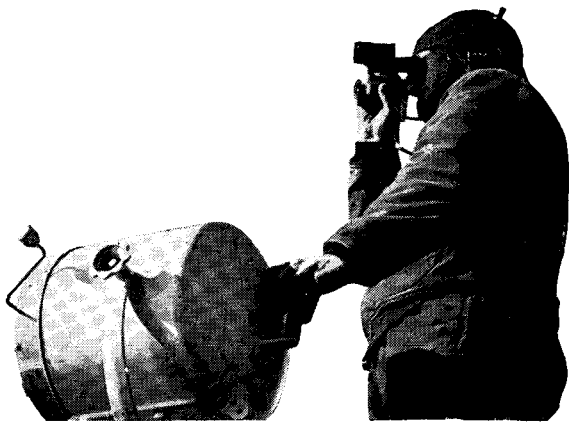
When the restrictions are removed, the product then offered will incorporate further engineering developments—progressive steps toward an even better mechanism.

Send for Illustrated Catalog

Full information concerning the Grand Rapids Invisible Sash Balance is contained in our well illustrated catalog. Send for it.

GRAND RAPIDS *Invisible* SASH BALANCE

GRAND RAPIDS HARDWARE COMPANY
GRAND RAPIDS • • MICHIGAN



Official U.S. Navy Photograph

LOOKING AHEAD

We're helping Uncle Sam solve HIS cold storage door problems NOW.

WHEN VICTORY COMES, we'll solve YOURS.

JAMISON COLD STORAGE DOOR CO.

Jamison, Stevenson and Victor Doors

HAGERSTOWN MARYLAND

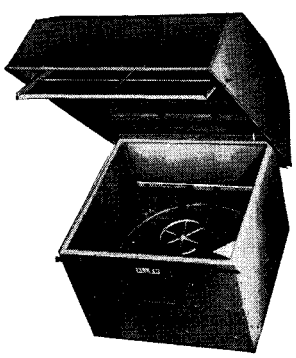
JAMISON-
BUILT COLD STORAGE DOORS

See our Catalog in Sweet's Catalog File.

ALLEN POWER ROOF VENTILATOR
Meets War Requirements

Now available with housing built of non-critical materials; specially prepared plywood, masonite and others.

The ideal "Blackout" ventilator! No loss of valuable war production time during blackouts because of inoperative ventilation equipment.



TYPE "H"

Low power consumption. Exhausts large volume of air with comparatively small motors. Wide range of sizes; capacities 5600 c.f.m. to 45,000 c.f.m.

Ford Willow Run plant completely equipped with Type "H" ventilators. Literature on request.

The ALLEN Corporation

9761 Erwin Ave. Detroit, Mich.

We call it the "VICTORY" department

WITH ALL THE ROAR AND HUSTLE

of big-time war production, there is one little corner of the Fitzgibbons plant where veteran boiler-making experience has its eyes focused on "V-year." In this secluded corner, new and better Fitzgibbons steel boilers and air conditioners are being planned. These new boilers and air conditioners will be riding right on top of the surging wave of building which will come roaring into being when Victory opens the sluice-gates to the dammed-up flood of orders.

Thus while much of the present effort of Fitzgibbons is to spread among our enemies discomfort, inconvenience and downright catastrophe, Fitzgibbons is set to distribute comfort, convenience and health at the call of "Cease Firing"!

BUY U. S. WAR BONDS and STAMPS

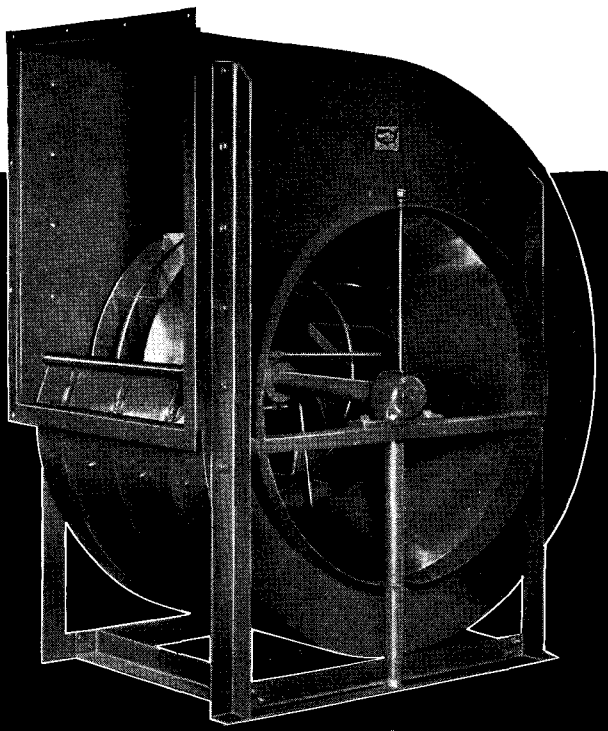
Fitzgibbons Boiler Company, Inc.

101 PARK AVENUE • NEW YORK, N. Y.

WORKS: OSWEGO, N. Y. OFFICES IN PRINCIPAL CITIES

FITZGIBBONS

Steel Boilers and Air Conditioners for the homes of tomorrow



Serving Big Business and serving it continuously...

USAIRCO

can produce and deliver air handling equipment for factories, army bases, ships

VAST Industrial Plants, newly-created to provide the machines and supplies of War, put the tools of Air-Conditioning to steady use. To meet the varied requirements of Industry USAIRCO Engineers are called upon to design equipment able to deliver to performance constantly.

Today's business permits no slack time—no on-and-off operation. The pitch of production is keyed to 24 hours steady work. To help men and machines hold this pace, USAIRCO air handling equipment serves a vital need. It helps to keep working atmosphere constantly comfortable.

USAIRCO Blowers, unit heaters, coils and air washers serve the increasing demands of Industry with experience of 19 years in the air conditioning field.

Complete data and prices are available—as well as engineering counsel for your job.

USAIRCO Air Conditioning Equipment

UNITED STATES AIR CONDITIONING CORPORATION

Manufacturers of the most complete line of air-handling equipment. Factory representatives in principal cities.

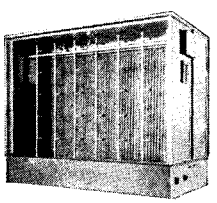
NORTHWESTERN TERMINAL • MINNEAPOLIS, MINNESOTA

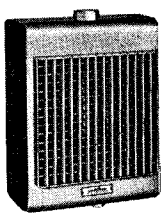
★ **HEAVY BLOWERS** ★

Backwardly curved blade type shown (also blowers with forwardly curved blades), also available in types and capacities ranging from 2,000 to 70,000 c.f.m. Used currently by many Government Services for large scale air handling jobs. Made in single and double inlet, and in a variety of air discharge arrangements.

AIR WASHERS

Single and double stage air washers are made in various capacities for all needs. They are used in installations where dependable equipment is required for air cleaning, cooling, humidifying or dehumidifying. Air Washers operate with cold water or refrigerating apparatus. For special installations such as shell-loading rooms or food-processing plants, double stage Air Washers help maintain safe atmospheric conditions at all times.



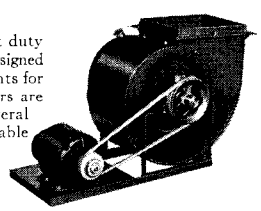


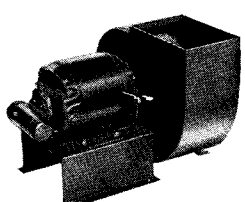
UNIT HEATERS

Suspension type small area heater for use with steam. Deflecto Grilles distribute heat where needed. This type of heater is ordinarily used to supplement central systems in large Defense plants, Army camp barracks and community buildings.

"E" BLOWERS

Belt-driven exhaust blower for light duty work where static resistance is low. Designed and built to meet today's requirements for flexible operation. Type "E" Blowers are easy to service—are available in several discharge arrangements. An adjustable pulley permits 30% speed variation to handle air as required in different installations.





"SU" BLOWERS

Direct-driven exhaust blowers are designed for use where space is too limited for a belt-driven exhauster. Built strongly, mounted rigidly to prevent vibration. Slow speed motor operates the wheel. A type of blower that is efficient for exhaust applications in warehouses, factories, barracks or mess halls.

★ ★

BE SURE OF GETTING THE RECORD

DON'T count on picking up back numbers of the 1943 ARCHITECTURAL RECORD later on. In conformity with Government orders, we've pared our 1943 press run to actual needs for paid-up subscriptions. The extra copies for new subscribers go almost at once. Surplus copies of the February issue are already sold out!

To be sure of receiving all the valuable ARCHITECTURAL RECORD services—more necessary today than ever — join our roster of subscribers without delay.

It's the only way you can insure yourself against missing such regular features as TIME-SAVER STANDARDS and BUILDING TYPE STUDIES and the many special articles on contemporary problems.

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To Fight ROOF COMMUNICATED FIRE!

Every fire that breaks out endangers nearby buildings as well as the burning structure. Especially vulnerable are buildings with inflammable roofs. Authorities state that more than 60,000 fires* a year originate on the roof—caused by falling sparks and embers.

Prevent such disaster especially where war production is at stake by insisting on Johns-Manville Built-Up Asbestos Roofs. Made of plies of fireproof asbestos roofing felts, they offer lasting protection against fire. Even flaming embers which fall on them burn out harmlessly.

*The National Fire Protection Association has estimated that in 1940 (latest estimate available), 62,000 fires were caused by sparks falling on inflammable roofs.

J-M Asbestos roofs withstand long exposure to sun, rain and inclement weather. They are rot-proof, and require little maintenance. They don't have to be coated periodically to protect them from the drying-out action of the sun.

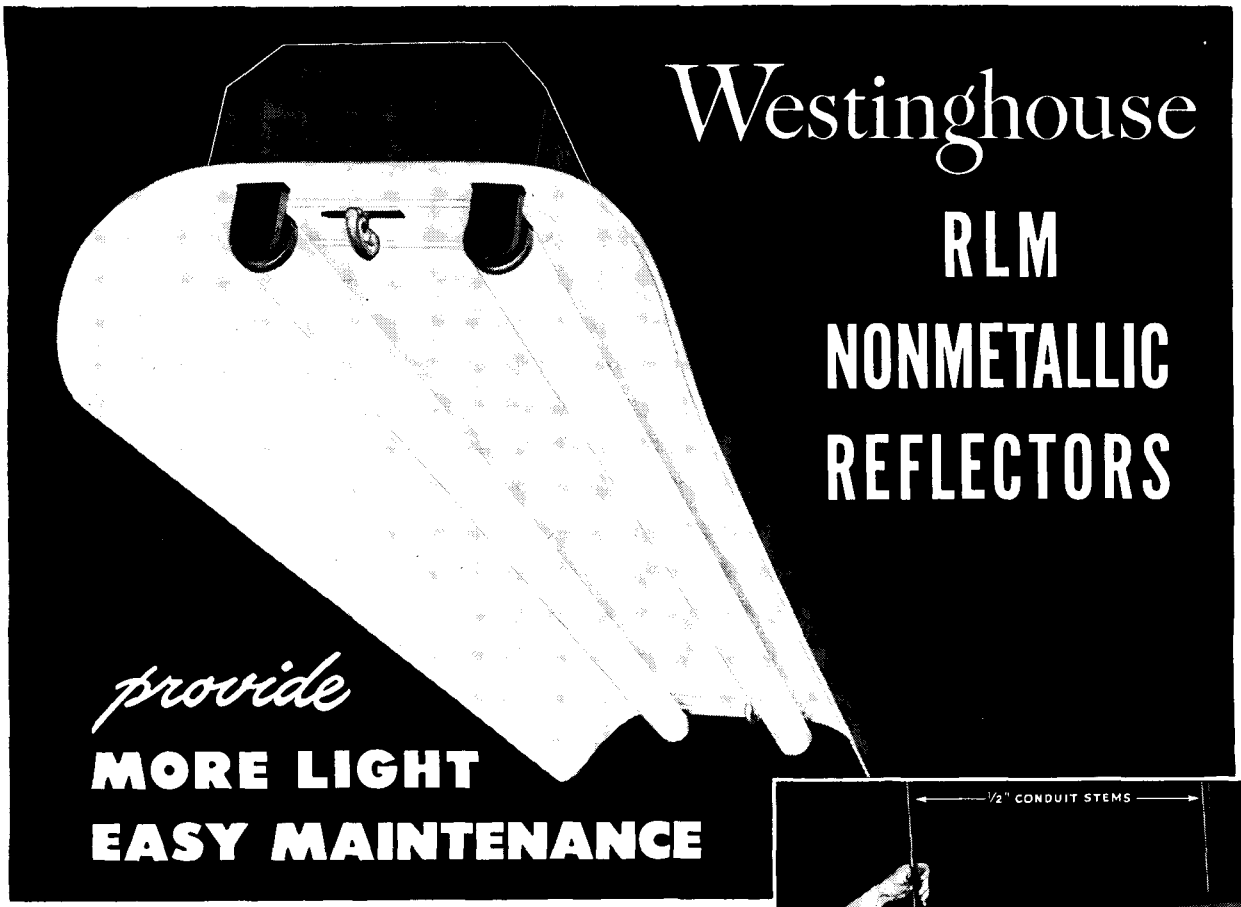
For complete details, send for copy of the 48-page illustrated book, "Things You Should Know About Your Roof." Johns-Manville, 22 E. 40th Street, New York, New York.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville

Asbestos

Built-Up Roofs



Westinghouse

RLM NONMETALLIC REFLECTORS

provide

MORE LIGHT EASY MAINTENANCE

For the want of steel—new nonmetallic fluorescent reflectors have been developed which give more light for 'round-the-clock war production and provide easy maintenance. They're the new Westinghouse pressed reflector-board reflectors—for 40-watt and 100-watt luminaires and for continuous-strip installations.

These easily detachable reflectors are interchangeable with previously installed equipment. There's neither wasted time nor effort in installation or servicing. Their durable, high-reflectivity finish resists scratching and chipping and is repellent to industrial acids and fumes.

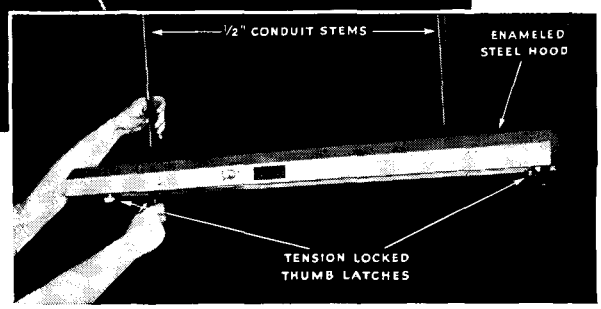
Nonmetallic reflectors are further examples of Westinghouse engineered seeing—the ability to adapt lighting to present-day war needs. For complete information, just write Westinghouse Electric & Manufacturing Company, Edgewater Park, Cleveland, Ohio, and ask for Folder B-3190.

117 Westinghouse Electric Supply Company Offices and Independent Westinghouse Lighting Distributors provide local stocks and services.

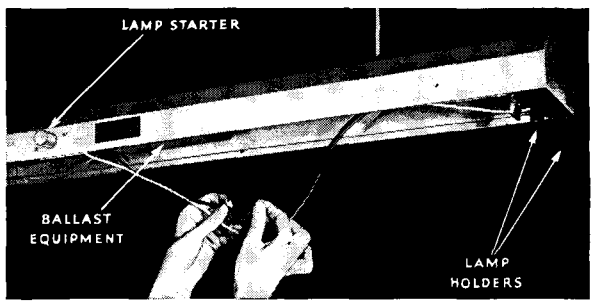
Plants In 25 Cities—Offices Everywhere.

Westinghouse

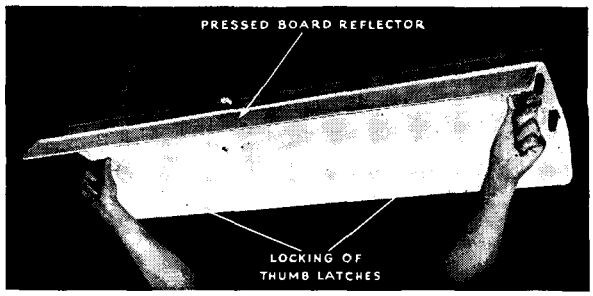
LIGHTING EQUIPMENT



Westinghouse fluorescent luminaires are easily installed. Units are arranged for rigid conduit, flexible conduit, or chain mounting.



Fluorescent ballasts, starters, and lamp holders are mounted in the hood. Units are furnished completely wired and ready to install.



New nonmetallic reflectors can be easily attached or detached. Units are approved by the RLM Standards Institute, and are so labeled.