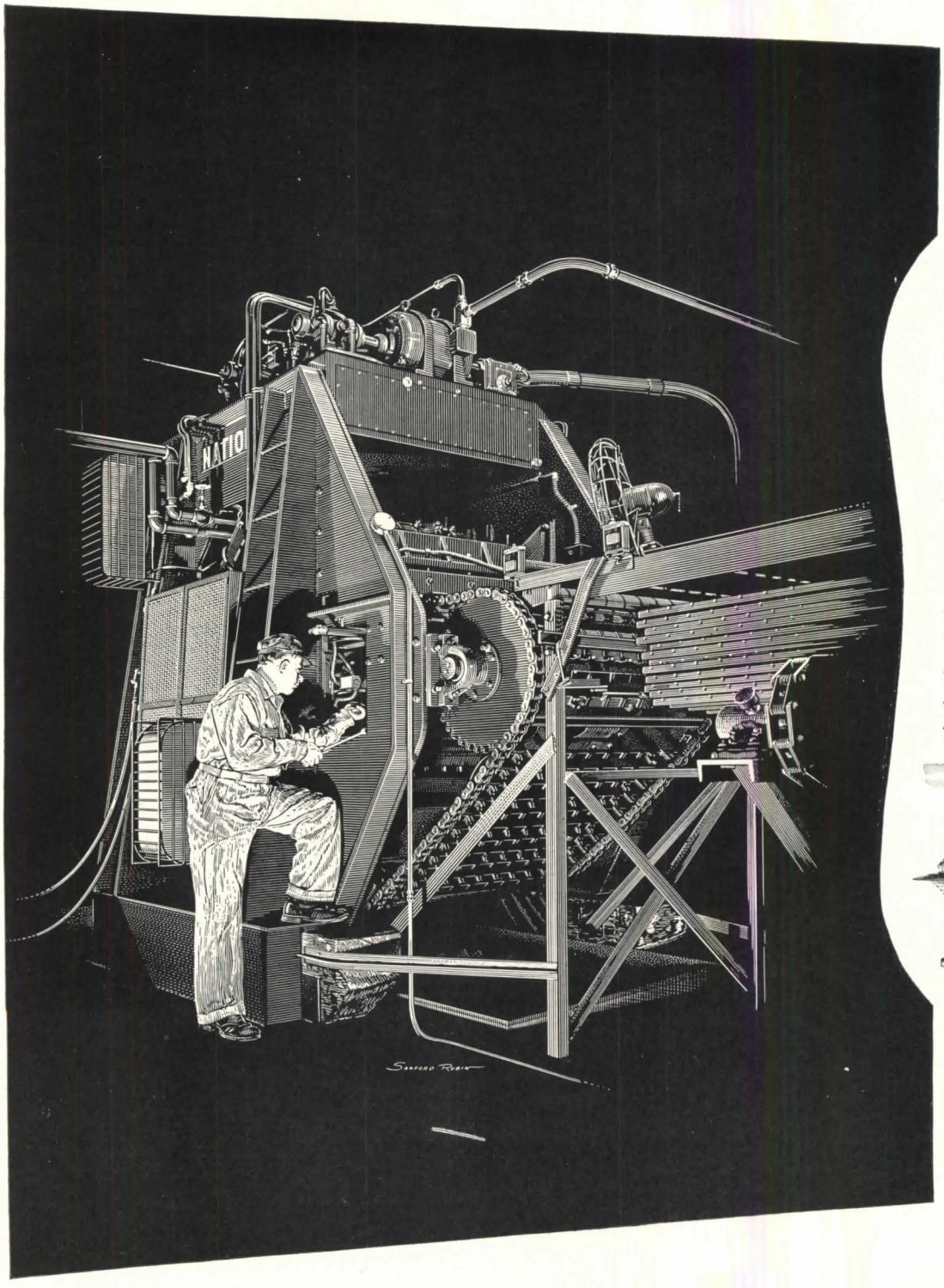
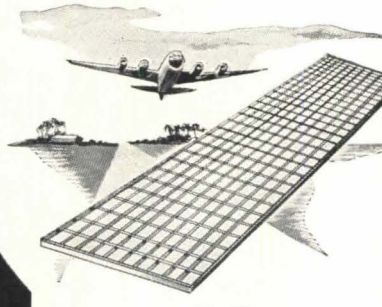
EVERYTHING WE ARE DOING TODAY..



Some Facts We'd Lik
You To Know Abou
Mesker Brother

Ever see a "hydraulicall
operated 40-gun automa
electric welder"? You'
looking at one . . . that *spi*
welds as fast as you can sa
"Zit, zit"! 24 hours a day, it's
the job, welding a war produ
very much *like* a windo
Tomorrow? You guessed

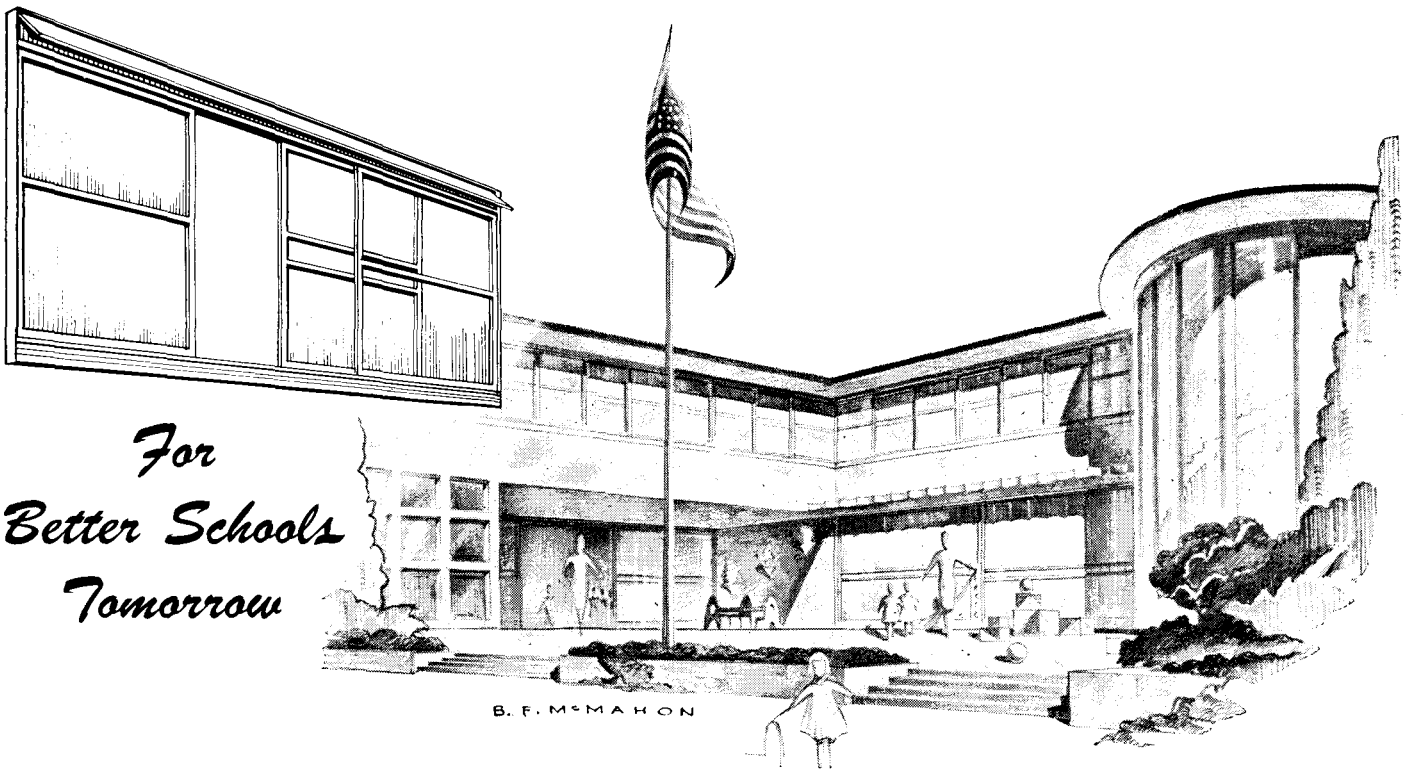


Mesker Engineers . . . the country over . .

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

I S D E S I G N E D T O H E L P Y O U T O M O R R O W



For Better Schools Tomorrow

Mesker Metal Windows

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

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

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

Consult Your Mesker Engineer Now!

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

In War and Peace . . . at your service!

Brothers

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

TODAY

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

Buildings "essential to War Effort" may take any form from housing to hospitals, but each presents the same primary problem in specification: to use materials that will *last,* and thus conserve the Nation's stock-pile of critical metals.

When piping materials were selected for the new Statler Hotel in Washington, D.C., the architects took every precaution to insure this maximum durability. Water analyses were obtained and studied, and piping history in various old buildings was reviewed. Wrought iron was then specified, and Byers Wrought Iron Pipe was used, for suspended soil, waste, drain and vent piping; hot and cold water piping; down spouts; and heating return lines.

A recent survey of seven buildings in Washington revealed plenty of evidence of wrought iron's dependability. The buildings ranged in age from 6 to 43 years. Wrought iron was used for hot and cold water lines in all. In one, 43 years old, some replacements are now being made—with wrought iron again the chosen material. The original wrought iron lines are still serving in the others.

Steam return lines in six of the seven buildings are wrought iron, and have given no trouble. A major portion of the drainage lines is also wrought iron. Only one replacement (a leader) has been reported.

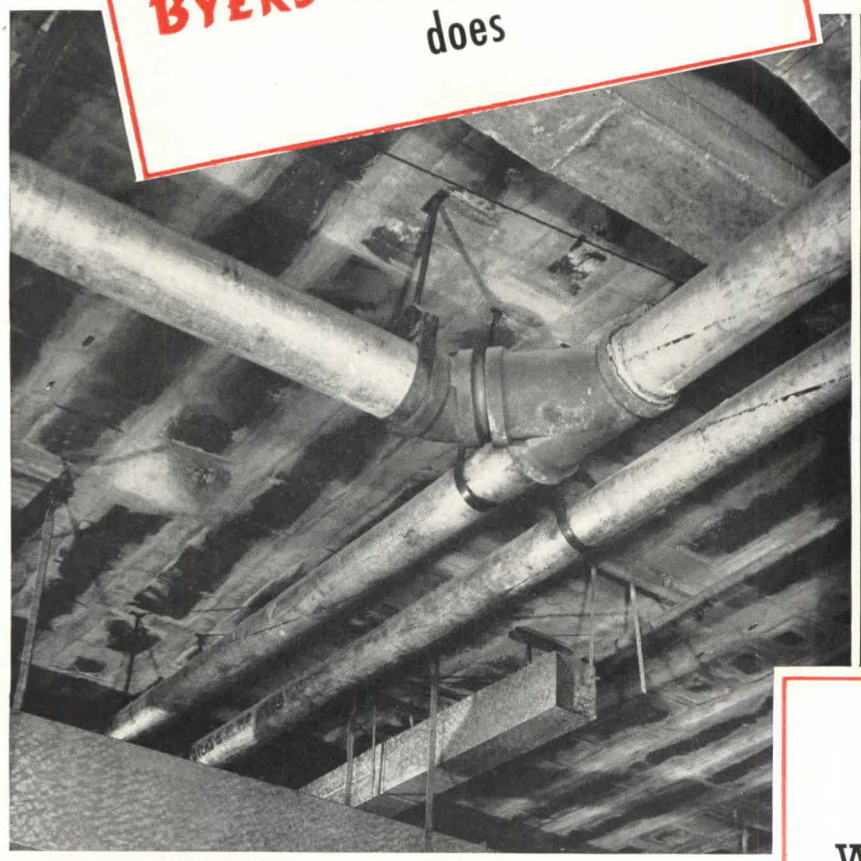
If you have any questions concerning the life expectancy of wrought iron in corrosive services, our Engineering Service Department is well equipped to help you find the right answers.

If you have any questions about availability and delivery, we urge that you also get the right answers, direct from "headquarters." Just contact a Byers Field Service Representative, the nearest division office, or Pittsburgh. When you feel that wrought iron is the best material to use, and the government—by its rating—indicates approval, the chances are excellent that we can meet your needs.

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

CORROSION
doesn't stay at the Statler . . .
BYERS WROUGHT IRON
does

Corrosion costs you more than Wrought Iron



PIPING IN STATLER HOTEL · WASHINGTON, D. C.
HOLABIRD & ROOT, *Architects* A. R. CLAS, *Associate Architect*

BYERS
GENUINE
WROUGHT IRON
Tubular and Hot Rolled Products
Steel Tubular Products

ARCHITECTURAL

RECORD

COMBINED WITH AMERICAN ARCHITECT AND ARCHITECTURE

VOL. 93 **FEBRUARY 1943** No. 2

CONTENTS

NEXT MONTH

THE PLANNING of war and postwar projects is going on side by side. In March we will show a building now devoted to research for war purposes which will later be expanded to take care of peacetime laboratory requirements. The extensions for peacetime have already been planned in the round, and plans for the new buildings will be changed only by such new requirements or new materials as may develop between now and the war's end. . . . New churches, except for the use of armed forces, cannot be built, but they are being planned. In the March issue, the trends in church plan, design and equipment have been incorporated in our Building Types Study No. 75, reporting the progress and best practice of the present as well as looking toward the future. . . . In March, we will also continue some further considerations of school building, representing the best thought from various sections of the country. . . . The British have progressed further in their organization for postwar work than has been possible here. Therefore our March story summarizes and reviews their objectives, methods and conclusions to date so that we may profit by their experience. . . . It was erroneously stated in this column last month that new industrial plants will probably account for the expenditure of a billion and three-quarters dollars during 1943. This figure relates to the total non-residential building expected and of this figure about nine hundred million will probably be invested in industrial plants.

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

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● *The magnitude of the War Department Pentagon Project at Arlington, Va., is best visualized by such facts as: provides working quarters for 40,000 employees; has nearly nine miles of corridors; has six large cafeterias.*

Chief Architects: George E. Bergstrom and David J. Witmer.
Consulting Engineer: Charles S. Leopold.
Plumbing Contractor: Fred Brutschy Co., Inc.

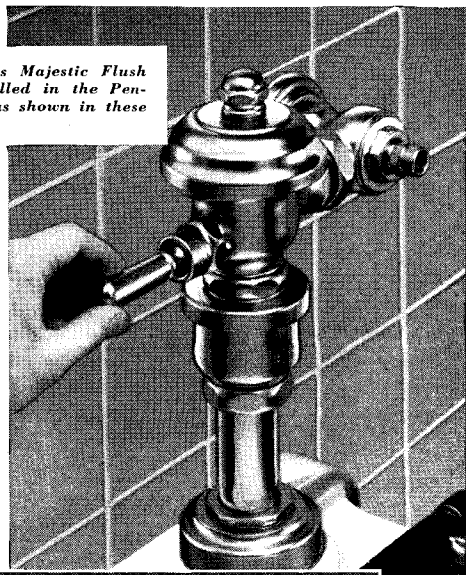
WATROUS FLUSH VALVES installed in the new War Department Pentagon Building—WORLD'S LARGEST OFFICE BUILDING

3,004 Watrous Flush Valves will bring to the new War Department Pentagon Building the "all-out" water and maintenance saving performance for which Watrous Valves are famous. Here in the world's largest office building these valves will demonstrate the tremendous extra savings that are possible when each valve can be *adjusted* to the actual water requirements of the fixture on which it is installed.

For detailed information on Watrous Flush Valves, including the new "V" model which is now available for essential applications, write for Bulletin No. 858-W or see the new 1943 Sweet's Catalog File, Catalog No. 39, Section 27.

THE IMPERIAL BRASS MFG. CO., 1240 W. Harrison St., Chicago, Ill.

● *3,004 Watrous Majestic Flush Valves are installed in the Pentagon Building as shown in these two views.*



Watrous Flush Valves

WASHINGTON NEWS

By WILLIAM J. CASEY

Construction under CMP • NHA as a Claimant Agency • AA-3 for Housing • WPB Construction Service • Housing Conversion • Heat Conversion • What's Ahead

THE PROGRESS in putting construction under the Controlled Materials Plan has been moving slowly. As this is written, the process of determining how much of the three controlled materials—steel, copper and aluminum—will be allotted to each of the thirteen Claimant Agencies is completed, and the Claimant Agencies are deciding how the material can best be used—whether for construction or other purposes, and if for construction, what type. The National Housing Agency has been made a Claimant Agency and together with the Army and Navy, will account for most of the controlled materials to be channeled into construction.

The Facilities Bureau of WPB has been designated to review all applications for construction and make the proper assignment to the appropriate Claimant Agency or Industry Division.

Application for permission to proceed with any new project is made in accordance with established WPB procedures to either a Claimant Agency or Industry Division exactly in the same manner as has been the practice. Such applications fall into several groups, as follows:

(a) Projects which involve the purchase of Class B products (listed in WPB "B" product book) and/or non-controlled materials only, shall be applied for on existing War Production Board forms and in accordance with existing regulations. Such forms include PD-1A and PD-3A. Examples would be the purchase of a machine tool, laundry machinery or electric motors.

(b) Projects which *do not* involve construction but *do* involve the purchase of Class A products, and include or not include Class B products or controlled materials as such, shall be applied for on Form CMP-4A. These applications are sent by the applicant to the appropriate Claimant Agency or Industry Division. An example of this type of purchase would be a locomotive.

In some cases the Claimant Agency or appropriate Industry Division may also request information on a supplementary form devised to replace summary bills of materials. Such supplementary forms will ask for a listing of requirements of controlled materials and Class B products.

(c) Projects which *do* involve construction and require the use of controlled materials as such, and may or may not require Class A or Class B products, should be applied for on existing WPB forms and in accordance with existing regulations. Form PD-200 is the most widely used of such forms. Processing of such forms (conservation or "stripping" being the major operation) will be performed by the same offices now authorized and active in this work. After processing, the Claimant Agency or appropriate Industry Division requests the submission of an application for controlled materials on form CMP-4C. This request may also be accompanied by supplementary forms listing requirements of controlled materials and Class B products at the discretion of each Claimant Agency.

It is the responsibility of the Facilities Bureau to assign to the appropriate Claimant Agency or Industry Division all projects which have been previously approved.

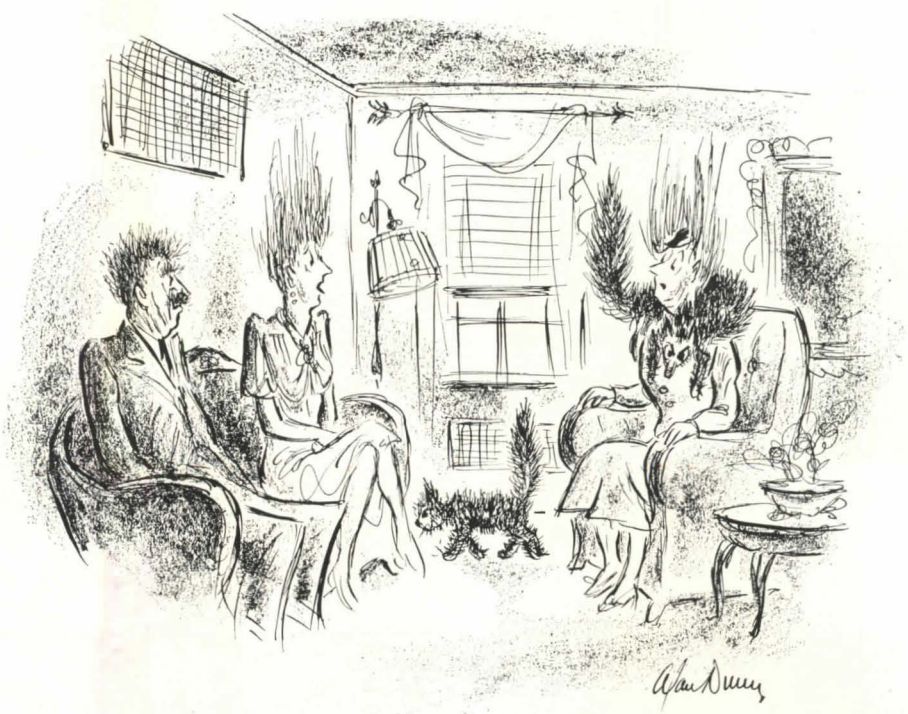
It will be the responsibility of each Claimant Agency or Industry Division to notify the prime consumers of all such existing projects as to which form should be filled in order to secure materials to complete the project.

NHA as a Claimant Agency

Official recognition of the National Housing Agency as a Claimant Agency under CMP should help building substantially. Previously, WPB has indicated that it would issue priority certificates for a specific number of dwelling units. Housing was programmed on this basis and after processing by Federal Housing Agency, National Housing Agency and War Production Board, priorities finally issued. A good part of the priorities were not high enough and building bogged down. Decisions made by the Requirements Committee, the Construction Board and the Office of Civilian Supply, within the War Production Board, controlled building progress. Now, NHA is inside the materials control picture controlling allotments and materials and is in a position to assure material delivery.

There will be a National Housing

(continued on page 10)



"I just bristle when I think of that electrostatic air-cleaning man's being drafted."

—Drawn for the RECORD by Alan Dunn

An Architect speaks of

Reginald E. Marsh, *of the firm of Tooker & Marsh, architects of many of America's finest Schools, is an expert on equipment and materials for school construction. Nearly three years ago, and again recently, he commented on oil burning systems; both observations are quoted below:*

IN April, 1940, Mr. Marsh said:

"In recent years we have specified oil burning systems almost exclusively for the schools we have designed. Based on experience with a number of installations in which we have used the fully automatic system with No. 6 oil, I find that it cuts fuel and maintenance costs, means labor saving, provides cleaner operating conditions, and results in all-around increased efficiency. We have found the Petro Oil Burning System entirely satisfactory to our clients and ourselves. It is sturdy, simple and efficient."

And now—

"Problems confronting us today," says Mr. Marsh, "are vastly different from those of a few years ago. We are at war, and it is our duty to make the wisest use of oil, for oil is ammunition. Where oil heating systems are in use in war plants, they have proved themselves efficient and durable in their 24-hour, 7-days-a-week performance.

"We have had time to do a lot of thinking about the school of the future. It will be a better school than the one of 1940. It will incorporate new services and materials we have learned from war building. The classroom will be more functional, and the health and welfare of the pupil will be major considerations in line with developments in education.

"When oil again flows freely, oil heating systems for schools will be logical equipment. I have every reason to carry on with my comments of the past—the Petro System is sturdy, economical and efficient."

Oil Burning Systems for the Schools of the Future

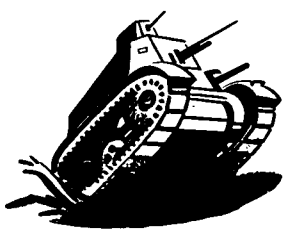
Based on His Experiences of the Past

This forecast which Mr. Marsh makes for the school of the future is also applicable to much other future construction and equipment.

Today Petro's entire capacities are devoted to war production. But research and development can be advanced with no detriment to the war effort, and Petro's engineering corps is working steadily on such things. The better schools, public buildings and other structures of the future will no doubt gain from discoveries made during the war. It is even more likely that they will benefit from improvements in familiar materials and equipment.

Much helpful knowledge already has been gained from Industry's war effort. Petro systems designed and installed for normal times have carried terrific overloads month after month. Such conditions telescope time for research engineers. Each month of such operation provides data and observations which would require years of peace time to equal. Similarly, our manufacturing processes on war materiel has developed much that will be directly beneficial when large scale production of Petro oil burning equipment is resumed. Because no changes in Petro equipment are ever made until ample proof of betterment is established, no specific report or prediction can be made now. But when the forward looking architect, engineer, or builder is once more free to build the "structure of the future", he can be sure that Petro oil burning equipment he will have for consideration will deserve a place in his better building.

And at that time, qualified Petro engineers will be available to consult and cooperate on the selection, specification and installation of oil-firing equipment that will squarely meet the future's standards of operating efficiency.



OIL IS AMMUNITION
USE IT WISELY

Full data on Petro Industrial Burners are in our Catalog in Sweet's Catalog file—or we will gladly send copies on request.

PETROLEUM HEAT AND POWER COMPANY

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

PETRO
Cuts Steam Costs

(continued from page 7)

Agency representative on each of the 14 branch sub-requirements committees, which will have to do with materials essential to housing construction. These sub-committees function for power, lumber, copper, steel, plumbing and heating, durable goods, construction machinery and other branches.

AA-3 For Housing

Both privately and publicly constructed war housing, previously struggling along on an AA-4 rating, now stand a better chance of getting materials.

A blanket preference rating of AA-3 was assigned to WPB to deliveries of materials for use in the construction of most of the war housing projects being carried on by the National Housing Agency. The new WPB action, which makes the up-rating automatic for the builder, affects the war housing for which preference rating orders P-55 have been issued to a builder, or P-19-d and P-19-h have been issued to the Federal Public Housing Authority. The builder is responsible for extending the new rating to his supplier. It was also announced at the same time that all AA-4 ratings assigned by preference orders of the P-19 series were raised to AA-3. No change was made in ratings below the AA-4 level. Orders of the P-19 series issued to Federal Public Housing authorities were accepted from the provisions since such projects are covered in the blanket up-rating of the war housing.

WPB Construction Service

Considerable savings in time and money on the part of applicants for substantial construction projects can often be effected by using the preliminary service of the Materials Control Branch of the Construction Bureau of WPB. Architects, contractors, builders and others who have preliminary drawings and approximate lists of materials available may consult with WPB before making final drawings and submitting formal application to begin construction. In this way, the builder can be advised of the latest regulations regarding use of materials and make whatever corrections are necessary to conform. Later, when he is ready to file his formal application for priority assistance on PD-200, he should be able to give all information asked for on the form. For projects sponsored by Federal, State, County, Municipal or other Governmental agencies, inquiries should be directed to Governmental Division, War Production Board, Temporary "E" Building, Washington, D. C. For all other projects, inquiries should be directed to the Materials Control Branch, Construction Bureau, 54th Floor, Empire State Building, New York City, or the Architectural and Codes Section, Specifications Branch, Conservation Division, 8th Floor, Washington Gas Light Company Building, Eleventh and H Streets, N. W., Washington, D. C.

Housing Conversion

Liberalization of the contract under which the Government leases private homes and other buildings for conversion into accommodations for war workers has been announced by NHA. Major revisions are: (1) The Government will be obligated to complete any conversion project it starts, or to restore the building to its original condition; (2) if the property owner desires further alterations than those deemed sufficient by the Government, he will be permitted to participate in the same conversion project using his own funds for the purpose; (3) if the Government takes over mortgage payments on a property and the mortgage is paid up during the life of the lease, the Government from that date on will add the amount of the mortgage payment to the monthly rental it pays the property owner; (4) the overall cost of conversion in the future will be limited to $2,500 per unit produced, instead of $400 per room.

Results in the conversion program have been disappointing so far. Only a comparatively few leases have actually been signed, although hundreds of properties are now in the planning or inspection stages. The trouble to date has been the submission of the wrong kind of properties.

Zoning laws have obstructed many projects. In many cases it has been necessary to compromise with partial or temporary conversions.

To give the conversion program a shot in the arm, the conversion job has been turned over to the Home Owners Loan Corporation. In addition, real estate brokers have been given an important part in the program—locating property most adapted to conversion. Thus, the relation which HOLC has built up with real estate brokers, while handling and disposing of its foreclosed properties, will be put to work to push conversion of large buildings to war housing uses. HOLC will be authorized to lease a portion of a property where the rest of the property is now being used, thus making available many buildings where the lower floors are rented but the upper floors are vacant. HOLC will also be enabled to make temporary conversions in districts where zoning laws forbid multiple dwelling units, but will permit temporary accommodations for the duration.

Heat Conversion

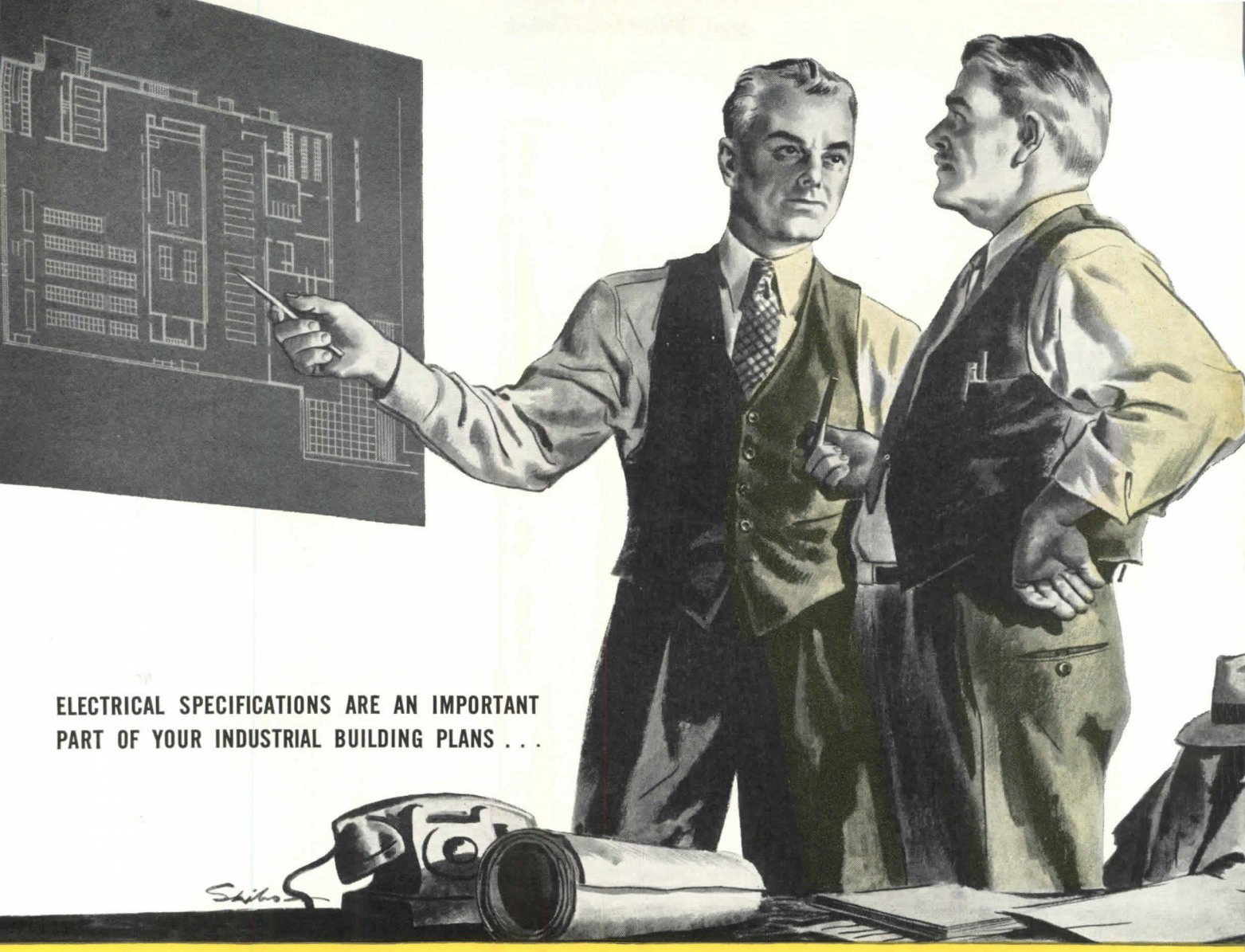
Present regulations, which provide that certain types of construction, necessary to the conversion or substitution of heating equipment to permit use of fuel other than oil, electricity, and gas, may be taken without specific authorization, have been extended to January 1, 1944. The former deadline was January 1, 1943. Similarly, the L41 order will not apply to construction begun prior to January 1, 1944, which is necessary to the installation or application in buildings of certain materials and equipment. These include insulation materials, air cell pipe coverings, weather strippings, and storm windows and doors. No rubber or metal, other than fastenings may be used in such installations or applications.

What's Ahead

The new Congress will be important to the building industry. First, the funds for the war housing program will have to be appropriated. Title 6 of the Federal Housing Act will be up for extension and the insurance limit of the Federal Housing Agency program will have to be extended.

Secondly, this will be an economy Congress. It is apt to be tough on

(continued on page 12)



ELECTRICAL SPECIFICATIONS ARE AN IMPORTANT PART OF YOUR INDUSTRIAL BUILDING PLANS . . .

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

When it's time for specifications, call in the man who can talk industrial and commercial electrical installations in your language.

They get around, these Square D Field Engineers. They're digging into wartime electrical control and distribution problems every day—working with *plants of every size and kind.* They study methods and applications with the idea of simplifying new jobs or doing old ones better. That is vitally important work during these days when the production front is facing its great test. It is equally important in planning now for speedy conversion the day peace comes.

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

★ ★ ★

Wherever Electricity is Controlled or Distributed

SAFETY SWITCHES ★ CIRCUIT BREAKERS ★ MOTOR CONTROL ★ SWITCHBOARDS ★ SQUARE DUCT ★ PRESSURE SWITCHES ★ PANELBOARDS ★ MULTI-BREAKERS ★ WELDING CONTROL MILITARY ★ AIRCRAFT ★ MARINE ELECTRICAL CONTROL

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KOLLSMAN INSTRUMENT DIVISION, ELMHURST, NEW YORK

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

(continued from page 10)

running appropriations for FHA, NHA and other housing agencies whose operations will be scaled down because of material scarcity. It is too early to tell how much money Congress is ready to let Administrator Blandford have for carrying out the important jobs of planning postwar housing.

Revision of the war housing standards have been substantially completed and are due to be issued shortly.

★ ★ ★

ASA COLOR STANDARD

A new color standard expected to eliminate much of the existing confusion in matching colors was explained and demonstrated at a recent conference held in New York under the auspices of the American Standards Association. The conference was attended by the press and leaders representing a broad cross section of the industries in which color is an important factor.

The objective of the standard, "Specification and Description of Color," is to reduce to a common language the results of years of technical developments in the measurement of color, and make possible the specification of color in terms that mean the same to everyone. It provides a language by which color may be described either by using the physicist's "dominant wave length," "brightness" and "purity," or by using the psychologist's "hue," "value" and "chroma." It also makes it possible to translate from one system to the other at will.

The spechtrophotometer is recognized as the basic instrument for the standardization of color, and the use of material standards (color samples) for the popular identification of color.

Two separate standards are provided: one, fundamental or primary, in terms of which any system of color samples can be calibrated; the other, a secondary or working standard, consisting of a series of color samples that already have been calibrated in terms of the fundamental standard, viz., the samples in the 1929 Munsell Book of Color. Either of these two standards makes it possible to identify a color, or to compare two colors by telegraph, merely by sending three numbers.

The wide adoption and use of the new color specification standard will put color specification on a more scientific and practical basis. It should help to eliminate much of the confusion now present in color specification not only for war products but for peacetime products as well.

URBAN REDEVELOPMENT FIELD STATION

The Massachusetts Institute of Technology announced recently the setting up by its City Planning Division of an Urban Redevelopment Field Station with funds granted for the purpose by the Albert Farwell Bemis Foundation. Associated in the direction of the Field Station's research program are Professor Frederick J. Adams, head of Technology's City

(continued on page 14)

Day-Brite VICTORY SERIES INDUSTRIAL FLUORESCENT FIXTURES

WHAT ABOUT NON-METALLIC REFLECTORS

The DAY-LINE UNIT . . . The same construction as the DAY-LINE CONTINUOUS. For chain suspension.

The non-metallic reflectors of these Day-Brite Fluorescent Fixtures have been designed to retain the contour which assures the highest degree of over-all illumination . . . Further, they are finished with a long-life "SUPER-WHITE" baked enamel that is strongly bonded to the reflector surface — is free from grains or "bubbles" — provides permanent high light-reflection values because it is *satin smooth* and easily cleaned . . . Again, the truss-like construction of the fixtures assures maximum rigidity of the completed installation.

Call your Day-Brite Engineering Representative.

DAY-BRITE LIGHTING, INC.
5488 Bulwer Ave. - - - - - St. Louis, Mo.

DayBrite Rivals Daylight — Adds Victory Hours!

Patent Nos. 2,297,869, 133,458
Other Patents Applied For

Day Brite Reg. U. S. Pat. Off.
FLUORESCENT FIXTURES

62

The COMPLETE LINE OF FLUORESCENT LIGHTING FIXTURES *Nationally distributed through all leading electrical supply houses*

THE RECORD REPORTS

(continued from page 12)

Planning Division, Philip H. Cornick of the Institute of Public Administration, New York City, and Edwin H. Spengler, Associate Professor of Economics at Brooklyn College and consultant to the National Resources Planning Board.

One of the important problems now being studied is that of the rehabilitation of urban residential areas where the existing buildings are in sound condition, but where the neighborhood pattern is obsolete. Careful estimates are being prepared of costs of bringing the environmental conditions in such areas up to a standard in line with modern needs and habits of living.

The purpose of the Field Station is to analyze various methods of urban redevelopment which are now receiving consideration, with the object of determining their relative value in terms of present-day social and economic conditions.

DRAFTSMEN NEEDED

Draftsmen in all fields are sought by the United States Civil Service Commission for work in engineering drafting. Persons with drafting in fields as remote as commercial art or interior decorating are urged to apply to the Commission. Positions in Federal agencies pay from $1,440 to $2,600 a year entrance salaries, not including payment for authorized overtime.

Qualifications are: at least six months of drafting experience, or appropriate training in drafting in high school, resident drafting schools or college. Students enrolled in regular or war training drafting courses may apply. No written test is required, and there are no age limits.

ASPHALT CONSTRUCTION SPECIFICATIONS REVISION

To conform with Recommendation No. 61 of the Petroleum Coordinator for War, as approved by the War Production Board, limiting the number of asphalt grades, The Asphalt Institute has made the necessary changes in its various construction specifications and issued them in pamphlet form with the title, "Construction Series No. 67—Emergency Revisions of The Asphalt Institute Construction Specifications." Copies are available upon request to The Asphalt Institute, 801 Second Avenue, New York City.

(continued on page 16)

Both are finding security in Copper and Brass

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

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

ANACONDA
from mine to consumer

4319

Anaconda Copper & Brass

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

THE RECORD REPORTS

WHO ✦ WHAT ✦ WHEN
WHERE ✦ WHY ✦ HOW

(continued from page 14)

WINDOWLESS PLANTS

In a meeting with officials of the Libbey-Owens-Ford Glass Company and a group of industrial architects, C. Howard Crane, wartime architect of the British Government, described the changes which war has brought to English industrial architecture. Windowless plants, Mr. Crane said, have proved to be particularly susceptible to bombing damage, and skeleton frame buildings have stood up very well with damage usually localized. All new English factories, he said, are constructed with blast walls approximately 14 in. thick and built 8 ft. high around every 10,000 sq. ft. of working area, providing a series of enclosures similar to a ship's bulkhead construction. A thin asbestos roofing material laid upon a steel framework and clipped to it likewise is preferred now to solid roofs, Mr. Crane added. The solid, so-called bombproof, roof offers so much resistance, he explained, to a bomb that the steel beams are blasted and twisted, causing far more damage and delay than results from a hit on the comparatively "resistless" type of roof.

ARTISTS FOR VICTORY

Because of the wide interest in its recent exhibit at the Metropolitan Museum of Art, New York City, Artists for Victory, Inc., has announced that a similar all-American exhibition will be held annually under its sponsorship. Smaller exhibitions, regional or thematic in type, will be circulated throughout the country. A new class of associate membership for individual artists has been voted by the organization, it also was announced, and arrangements have been made for *Art News,* published by the Art Federation, to become the official news organ, devoting a page in each issue to the activities of Artists for Victory.

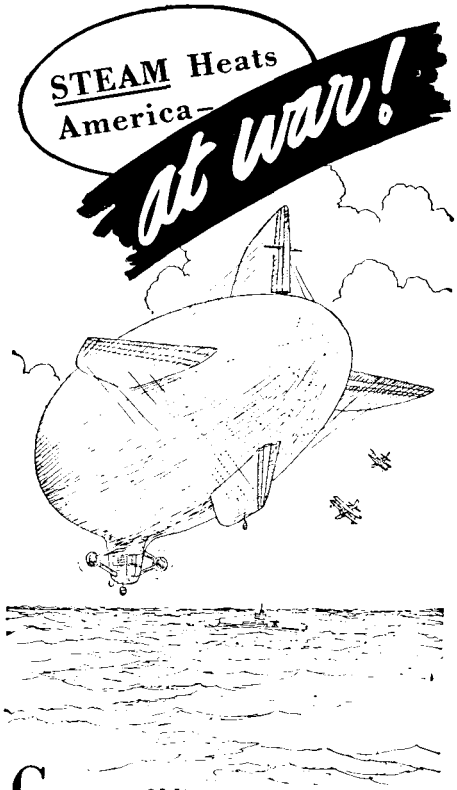
ENGINEERING UNDERGRADUATE AWARDS

The James F. Lincoln Arc Welding Foundation of Cleveland has announced a $6750 Annual Engineering Undergraduate Award and Scholarship Program "to encourage engineering students to study arc welded construction." In addition to 77 student awards totaling $5,000, there are 7 school scholarships of $250 each.

The awards will be made for papers describing the conversion from other methods to arc welded construction of parts of machines, complete machines, trusses, girders or structural parts. All material must be mailed not later than midnight, April 1, 1943.

FIRE BOMB FACTS

With the efficacy of fire bombs constantly being increased, OCD has published an up-to-the-minute "Fire Bomb Fact Sheet" (OCD Publication 5209, December, 1942), describing in detail the various types of enemy bombs now known to us, and how to fight them. Copies of the leaflet and further information may be had from Randolph Feltus, Editorial Section, Office of Civilian Defense, Washington, D. C.



CLOUDS of blimps to guard sea lanes.

To make it too "hot" for Axis U-boats.

It's the goal of American Industry to produce more blimps than the world has ever seen—and that goal is going to be achieved.

It calls for construction and conversion at record-breaking speeds to get into production as soon as possible.

In every war plant, proper heating is essential to maximum output.

Fifty years of experience taught America all of the natural advantages of steam—speed, safety, flexibility and economy.

Webster Systems of Steam Heating have proved their effectiveness in more than 75,000 buildings. The engineering skill that makes Webster Equipment effective is offered to architects, engineers and heating contractors working on war construction.

Today, we are engaged in direct war work, but manufacturing facilities are still available to supply Webster Steam Heating Equipment for buildings serving the war effort.

Essential repairs for Webster Systems are available on A-10 priority, under W. P. B. Emergency Repair Order P-84. Orders should be limited to actual needs.

Warren Webster & Company, Camden, N. J.
Representatives in 60 principal Cities

Webster
Steam Heating

This is one of a series of advertisements that tells the public of the part that Webster Steam Heating and the Webster organization plays in the war effort . . . appearing regularly in leading business, industrial, engineering and technical publications.

J. E. Hutchison, of Moody & Hutchison, Consulting Engineers, Philadelphia. Member of American Society of Heating and Ventilating Engineers.

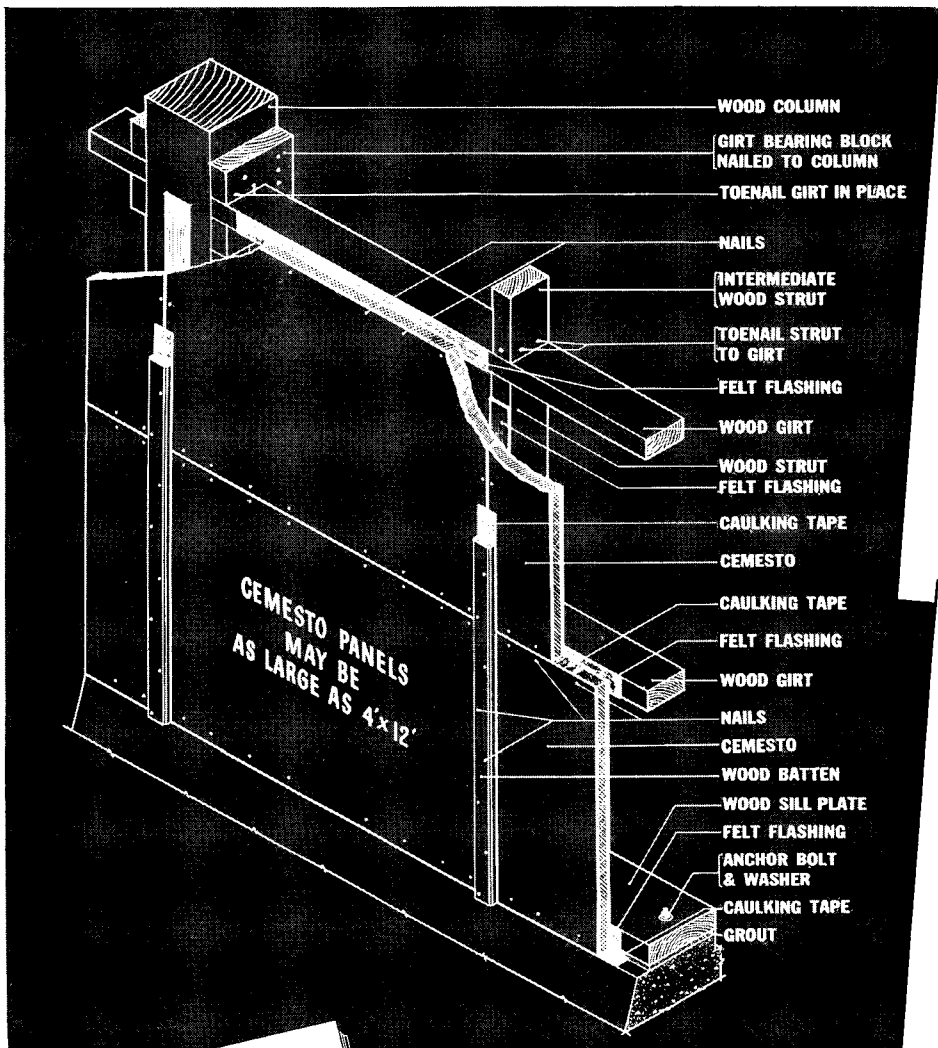
"The wisdom of providing adequate control of volume and distribution of heat is being proved today as the fuel situation becomes more critical," says J. E. Hutchison. "The present users of modern steam heating system controls are enjoying even temperatures with minimum fuel consumption. Irrespective of the fuel or firing method adopted, satisfactory heating results cannot be obtained without effective volume and distribution control. Without this control, heating is uneven and fuel consumption excessive."

Moody & Hutchison have specified the "Controlled-by-the-Weather" Webster Moderator System of Steam Heating for Cooper Hospital, Camden, N.J., and for the Academic Building and Cadet Barracks, U. S. Military Academy, West Point, N. Y. In the latter installation, eight heating zones are controlled from one central point. This firm made plans for Webster Vacuum Steam Heating Systems installed in many outstanding buildings, including the Municipal Court Building, Philadelphia; the Federal Reserve Board Building and Folger Library, both in Washington, D. C.; Bancroft Hall, U. S. Naval Academy, Annapolis, Md.

WARREN WEBSTER & COMPANY

CAMDEN, N. J., EST. 1888, PIONEERS OF VACUUM STEAM HEATING

PROBLEM: *To Erect Mill Building Walls with Minimum Use of Critical Materials . .*



. . . Using Wall Units which combine all these advantages in one thickness:

√ STRUCTURAL STRENGTH

√ EFFICIENT INSULATION

√ GOOD APPEARANCE

√ EASY HANDLING

√ FAST ERECTION

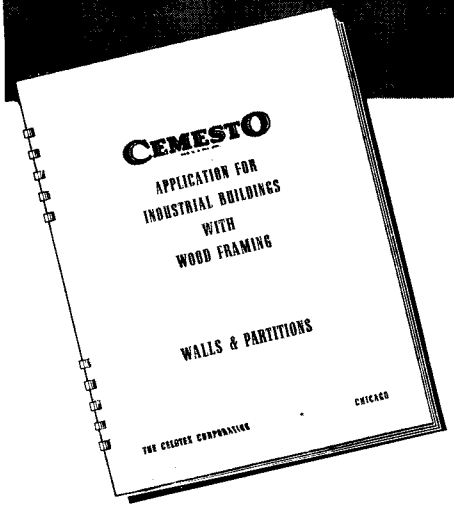
SAVING NAILS

SAVING LUMBER

SAVING TIME

SAVING DECORATING EXPENSE

SAVING MAINTENANCE EXPENSE



ONE thickness of Cemesto does the work of many materials. That is why Cemesto construction is setting new records for speed in factory construction with wood framing. This revolutionary new method deserves the attention of every architect. Bring your files up to date by sending for this new Cemesto portfolio now. It contains a wealth of detail drawings and descriptive specifications. A request on your letterhead will bring it promptly.

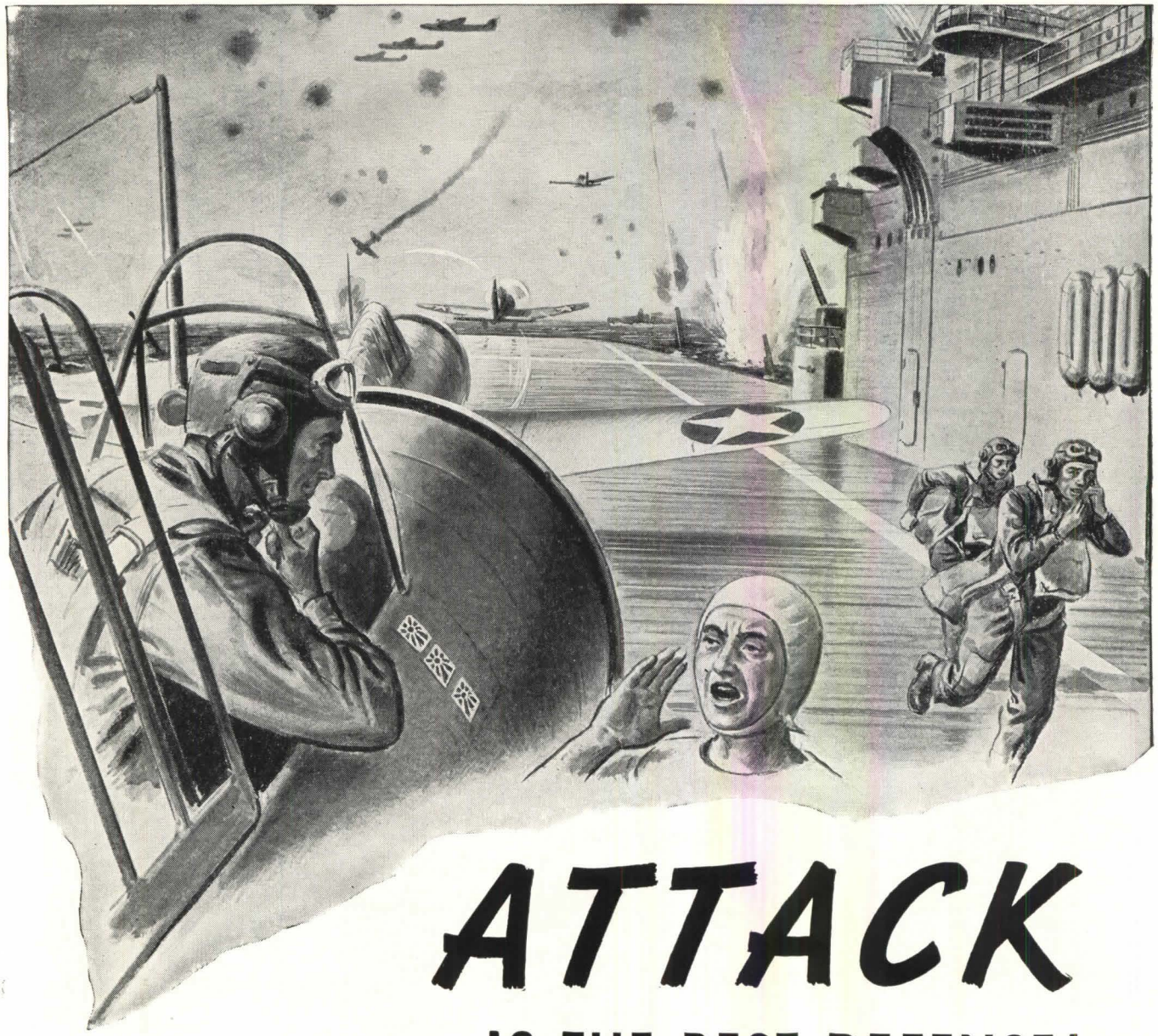
ASK FOR THIS
NEW PORTFOLIO
OF CEMESTO APPLICATION
TO WOOD FRAMING

CELOTEX
REG. U. S. PAT. OFF.

CEMESTO
REG. U. S. PAT. OFF.

The word Celotex is a brand name identifying a group of products marketed by The Celotex Corporation.

THE CELOTEX CORPORATION • CHICAGO



ATTACK

IS THE BEST DEFENSE!

Our strongest defense is a hard attack. That's an old Naval tradition now proving its truth on all the waters of the Seven Seas.

In similar fashion, the best defense against maintenance problems is a relentless, unceasing attack on carelessness and wear. Battery care, for example, is simplified if you observe four basic rules . . . which may be called your rules for attacking battery maintenance problems. Follow them faithfully, and remember, Buy to Last and Save to Win!

HERE'S HOW TO ATTACK YOUR BATTERY MAINTENANCE PROBLEMS

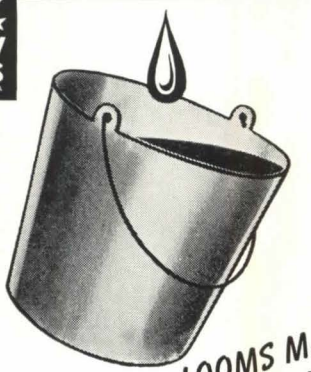
1. Keep adding approved water at regular intervals. Most local water is safe. Ask us if yours is safe.
2. Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.
3. Keep the battery fully charged — but avoid excessive over-charge. A storage battery will last longer when charged at its proper voltage.
4. Record water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings.

If you wish more detailed information, or have a special battery problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for booklet Form 3225.

Exide
EMERGENCY
BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

(Official U. S. Navy Photograph)



SINCE PEARL HARBOR...

These 6 drops, contributed by Bigelow, to the flood of national war effort have in part required the elimination of weaving special carpet for hotels, restaurants, theatres and institutions.

LOOMS MAKE DUCK

Bigelow not only weaves large quantities of heavy duck but is also engaged in converting this material for gun covers and other uses.

LOOMS MAKE BLANKETS

Axminster looms that once made floral patterned rugs are turning out large quantities of blankets for the armed forces. And Bigelow is now ready to double that output in 1943.

CAMOUFLAGE CLOTH AND TIRE SANDALS

Bigelow's War Products division is producing many diversified items such as Camouflage Cloth, Tank Crash Pads, Fabrication of many ordnance parts and a Tire Sandal that will add 3000 miles to old worn out tires.

MACHINE SHOPS MAKE TOOLS AND ORDNANCE

The Machine Shops that once built and repaired Bigelow looms are now producing machine tools, machine tool parts, and ordnance for the armed services.

879 MEN ENTER THE ARMED SERVICE

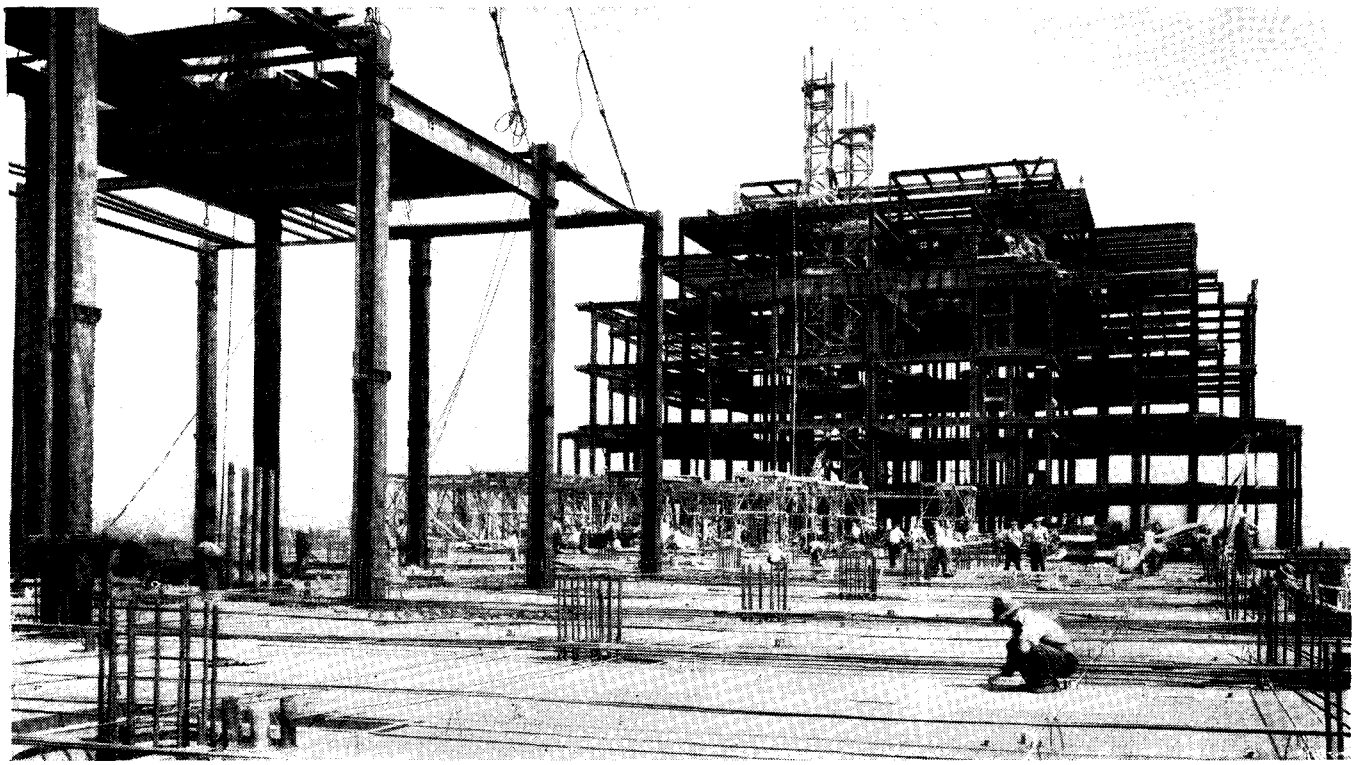
There are Bigelow men from the Mills and the Offices in every branch of service. Some are in England; some are on the decks of destroyers; while others are dishing it out from the working end of a Nordin bombsight.

10% OF EARNINGS FOR WAR BONDS

Bigelow employees developed a War Bond drive that has been a complete success. 94% of our people have subscribed. Secretary Morganthau wired, "I congratulate the employees of your organization."

BIGELOW WEAVERS

140 MADISON AVENUE, NEW YORK, N. Y.



HOW TO HELP A MUNITIONS PLANT GROW UP!

Munitions plants don't grow like mushrooms. But the faster they can be finished, the better it is for the cause of Victory.

When the United States Government was recently building a munitions depot in a mid-Western state, every proven method for speeding the job was employed. One of the first steps taken was the installation of an RCA Sound System *to be used while the plant was under construction.* In this way, the contractor could keep in touch with every section of the work, could page individuals instantly, could direct operations everywhere at once—could save time and work for men and machines. The munitions plant was finished in record time, and the RCA Sound System helped it grow.

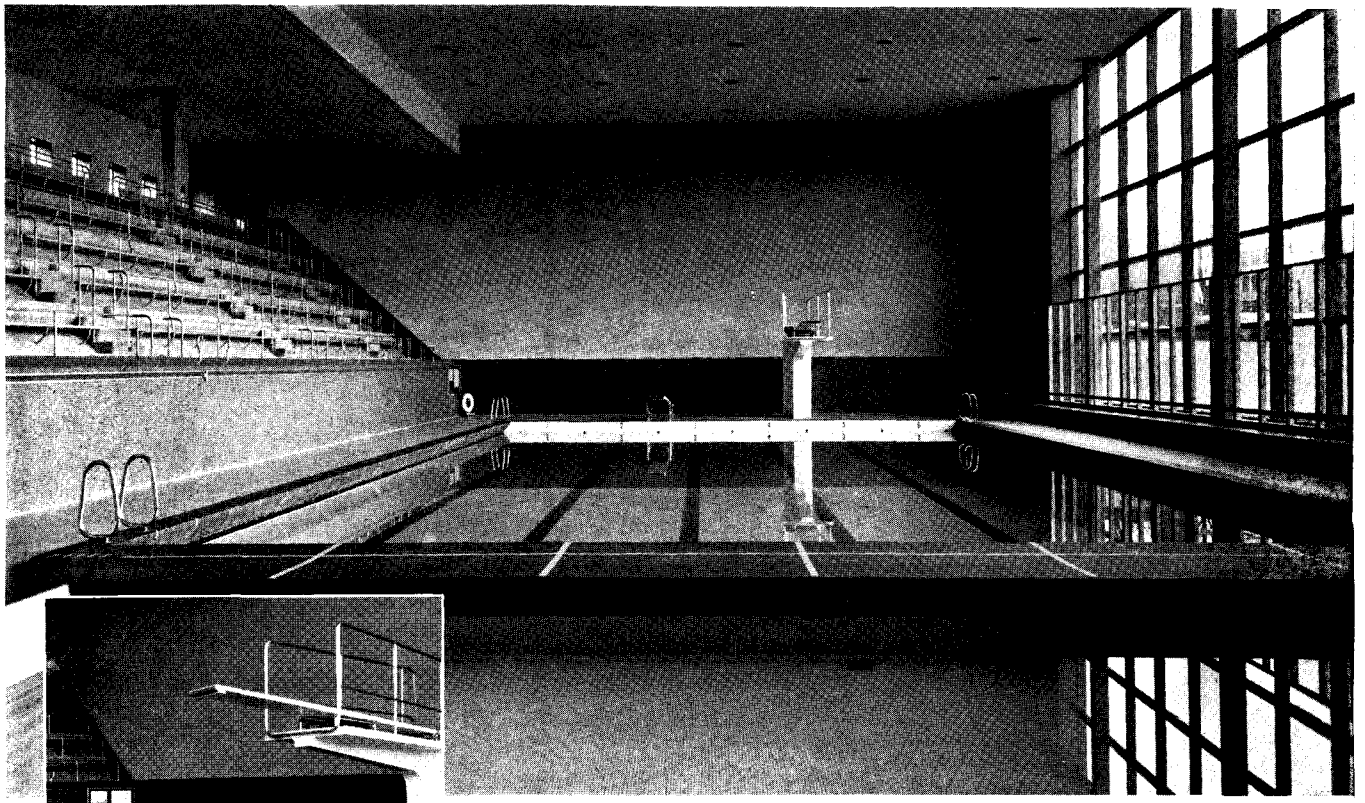
Upon the completion of the building, the design of the equipment permitted the use of these same items in the permanent plant-wide installation.

Every RCA Sound System is tailor-made, engineered to fit specific needs and cope with specific problems. Whether its primary use is for expediting production, paging, plant service and maintenance, music, employee education, or emergencies —whether it is wanted chiefly for plant protection, worker morale, or to save time, an RCA Sound System can help your clients do a better job of helping the war effort. See your nearest RCA Sound Distributor or write RCA Victor Division, Radio Corporation of America, Camden, N.J., Dept. 2-3.

RCA SOUND AND PICTURE EQUIPMENT

RADIO CORPORATION OF AMERICA

Camden, New Jersey



Swimming Pool, Massachusetts Institute of Technology, Anderson and Beckwith, Architects. The swimming pool is six-lane, 42 by 75 feet, and the shallow practice pool is 20 by 40 feet. Seats for 340 spectators are provided in the room.

THEY SWIM IN SAFETY IN STERILIZED WATER

Wallace & Tiernan Chlorinators accurately control the application of chlorine to maintain a residual sterilizing action throughout the pool, for constant protection of the user against contamination from any source.

In schools especially, Wallace & Tiernan Chlorinators protect the nation's youth, whose good health means so much in carrying us to victory.

War production has very rightly set up priorities which make new W & T equipment unavailable for schools for the duration. But meantime the Wallace & Tiernan organization is keeping present installations in top working condition, thereby insuring safety for swimmers.

Many architects and engineers are taking advantage of this nation-wide service. Ask us about it, also for the W & T Swimming Pool Technical Publications which review water treatment for various types of pools.

"SWIM IN DRINKING WATER"

WALLACE & TIERNAN CO., INC.

Manufacturers of Chlorine and Ammonia Control Apparatus

NEWARK, NEW JERSEY

Represented in Principal Cities

They're learning a lot about fuel saving!

Adversity is a great teacher. Thousands of dwellers in homes large and small are today finding out things they never knew about heating economy. Some of them are learning the hard way — discovering for the first time that their heating equipment is wasteful of fuel, and that restricted rations mean discomfort. Now they're watching the fuel gage with hawk-like intensity, and praying for an early Spring.

Others, however, have a self-satisfied look when the subject is broached. These are likely to be the people who have Fitzgibbons Steel Boilers or Air Conditioners. They have perhaps shut off a spare room or so, learned to use care in other ways, and without sacrifice of comfort are keeping within their budgeted fuel ration. These people are feeling pretty thankful today, for the excellent judgment of their architects in specifying "Fitzgibbons."

Among the less fortunate, more and more often you hear the plaint—"Wish I had a Fitzgibbons — I'll never build another house without one!"

BUY U. S. WAR BONDS and STAMPS

MOST ECONOMICAL IN FUEL · 1886 · THE FITZGIBBONS BOILER

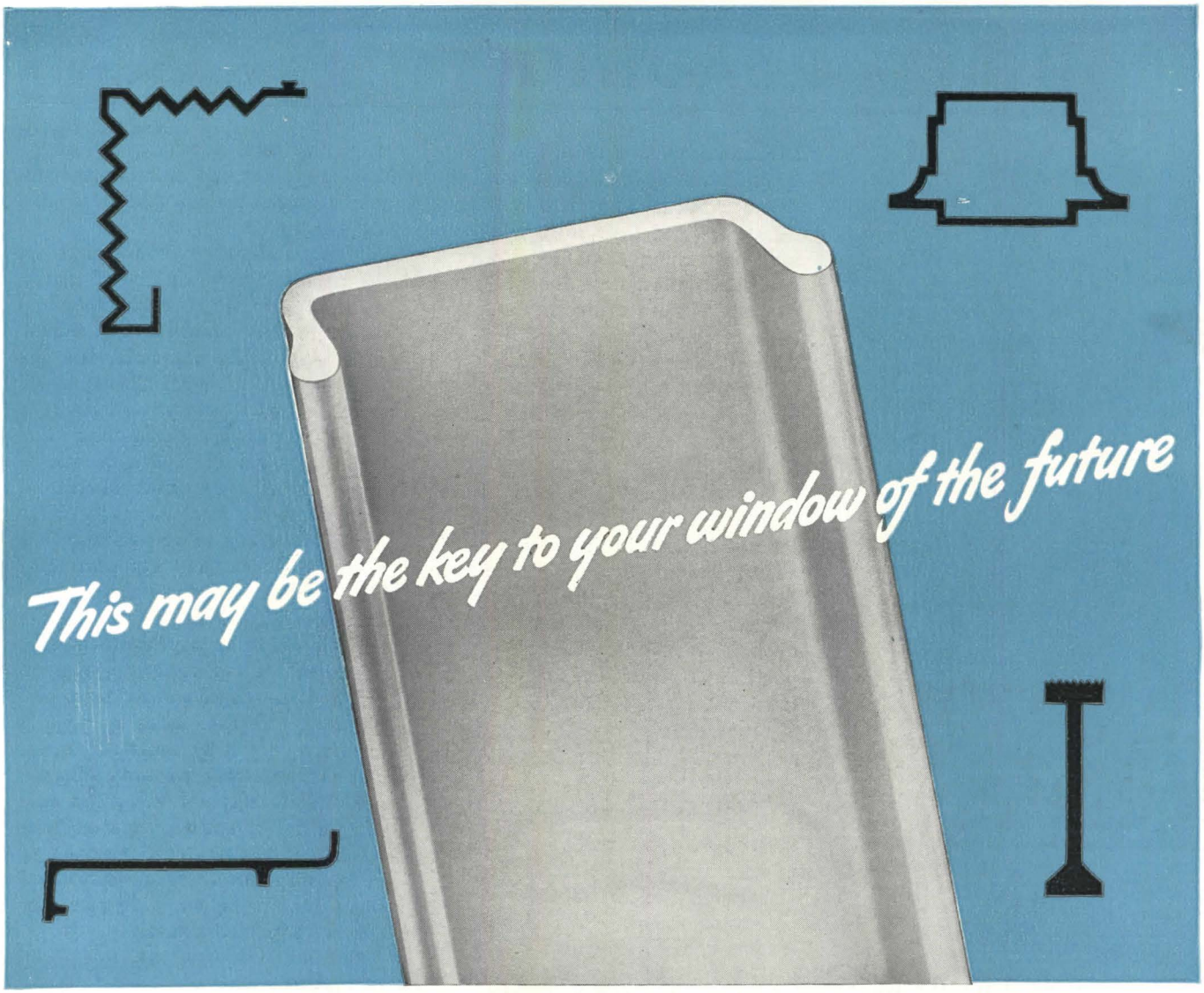
Fitzgibbons Boiler Company, Inc.

101 PARK AVENUE, NEW YORK, N. Y. WORKS: OSWEGO, N. Y.

Branches and Representatives in Principal Cities

FITZGIBBONS

Steel Boilers and Air Conditioners that make fuel go farther

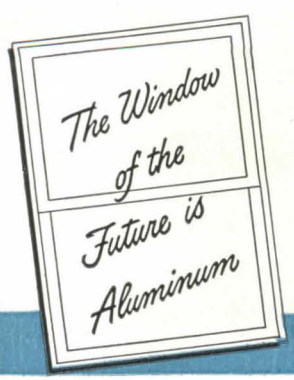


This is an Alcoa Aluminum extruded shape, produced for use in building vital war equipment. Such shapes can be designed with contours exactly meeting your needs. At the same time, metal can be placed just where needed for strength and stiffness. Shown also, in silhouette, are other Aluminum Alloy extruded shapes, produced for architectural uses before the war.

Prewar Aluminum windows, built up of Alcoa extruded shapes like these, were light in weight, easy to operate, weathertight, and fine in appearance. That, too, is your window of the future.

And windows are but one place in the architectural picture where you'll see such Alcoa Aluminum extruded shapes used to advantage; as sills and coping, in store fronts, skylights and partitions, as building hardware. The design possibilities, the light weight, corrosion resistance and attractiveness of Aluminum, are certain to cause Alcoa extruded shapes to be used widely for many architectural applications.

ALUMINUM COMPANY OF AMERICA, 2167 Gulf Building, Pittsburgh, Pennsylvania.



ALCOA ALUMINUM

Reg. U. S. ALCOA ALUMINUM Pat. Off.

REQUIRED READING

By ELISABETH COIT, AIA

Fresco Portrait of Pippo Spano by Andrea del Castagno. From "Mediaeval Art"

MEDIAEVAL ART. By Charles Rufus Morey. New York (70 Fifth Ave.), Norton, 1942. 414 pp. 7½ by 10 in. $6.50.

FROM THE MAP on the end papers through the opening few hundred words, which define the Middle Ages not only in time and space but also in character, to its well arranged index, this book is a delight.

The Marquand Professor of Art and Archaeology at Princeton considers the evolution of painting and sculpture. The word architecture has no place in the index and works on architecture are not included in the Reading List. Since, however, much of the art of the entire period is architectural in its application, the architecturally minded will find here an interpretation of mediaeval architecture. And, furthermore, the reader not especially interested in any branch of these arts will find here a rich essay on the period in general with trenchant observations on language, manner of life, politics, national, regional and racial organization.

With extraordinary precision and verbal felicity flows the narrative of the period during which "Christianity was the persuasive leaven" of Mediterranean and European culture, up to the rise of the Renaissance when "so to speak, men began to look upon themselves and their surroundings as more interesting than God," with a dramatic contrast here, there a happy mnemonic, again an unexpected parallel, a word or phrase borrowed from whatever language best conveys the thought, all these and 179 photographic figures on plates with in addition about as many line drawings in the text.

Publication at this time is particularly fortunate since this work, the latest beautiful book by a versatile author whose work during some three decades has appeared with many important imprints, forms a kind of sequel to his "Early Christian Art," published a few months ago (Princeton Univ. Press, 1942. $7.50).

ALL ABOUT MODERN DECORATION. By Mary Gillies. New York (49 East 33 St.), Harper, 1942. 216 pp. 7¾ by 10¾ in. illus. $3.

STIMULATING, as well as penetrating in its analysis by the amateur's problem, is this book by *McCall's* interior decorating editor. "All about. . ." does not go unduly deeply into the manufacture of textiles, the theory of color and light, or the chemistry of paint; but it does give such practical suggestions for the selection and treatment of these that alike the most unadventurous homemaker with a small budget and the ambitious and well-to-do one will get enjoyment and profit from it. A personal, chatty style and many pleasant case histories carry the reader easily along; but there is also a great mass of specific information on essential dimensions, on quantities required, on materials, finishes, equipment, design and arrangement. Alternative solutions are contrasted. There are over forty photographs, many line drawings, some color plates, and a list of "designers . . . whose work you should know."

TOWN PLANNING AND ROAD TRAFFIC. By H. Alker Tripp, C.B.E. New York (55 Fifth Ave.), Longmans, 1942. 118 pp. 5½ by 8½ in. illus. $3.25.

SCOTLAND YARD'S assistant commissioner in charge of traffic here gives a view of planning and systematic road designing with emphasis on safety, though keeping well in mind convenience and economy in a densely populated country.

People cannot keep their minds on danger and the possibility of death, witness the 68,248 persons killed and the 2,107,964 injured on British roads during the ten years just before the war, of which "battle level" casualities local pedestrians formed a high percentage. Carelessness undoubtedly; but since human nature cannot be changed, roads should be designed to meet human needs. This Mr. Tripp shows to be possible, even relatively simple, and not unreasonably expensive; and in pithy prose and striking diagrams he shows possibilities for reform in existing town, suburban, village and country layouts, as well as laying down principles for new planning. Transportation by road is important; traffic by automobilist, cyclist and pedestrian has quite different needs; and quiet and safety for residents in zones, circuits, closes or "precincts" can be secured, as for example in London's Inns of Court, as secluded when Mr. Tripp wrote as no doubt they were in Tudor times.

FUNDAMENTALS OF PERSPECTIVE. By Theodore de Postels. Ed. by Don Graf. New York (330 West 42nd St.), Reinhold, 1942. 20 sheets. 8½ by 11 in. illus. $2.50.

AN INGENIOUS and graphic presentation in which the use of numbered lines in four colors with arrows for the well designed diagrams and tables reduces the text to captions, and these are edited in the best Don Graf manner.

PROPOSED POSTWAR WORKS PROGRAM. New York (Municipal Bldg.), City Planning Commission, 1942. VIII, 32 pp. 8½ by 11 in. illus. $0.25.

SURVEYS, plans and specifications for construction costing over $628 millions (in addition to $91 millions for housing) are in preparation, to help minimize the postwar dislocation of industry and to take advantage of the anticipated man-power and material available. The cost of completing plans and specifications alone will be well over $20 millions, a considerable contribution to the work of keeping

(continued on page 28)

REQUIRED READING

(continued from page 26)

By ELISABETH COIT, AIA

employed city architectural, engineering and technical staffs, as well as private firms and consultants.

HOUSING AND PLANNING RESEARCH IN NEW YORK CITY, 1937-1942. By Julius Fisher, New York (470 Fourth Ave.), Citizens' Housing Council, 1942. 77, xxvi pp. 8¼ by 10¾ in. $0.50.

DR. FISHER'S compilation of unpublished studies and surveys, prepared under the auspices of CHC's Committee on Housing and Planning Education, does for the New York area what architects, realtors, housing managers and sociologists would like to see done also for many other regions. The 239 items listed include some studies still in progress, as well as a few recently published; the items are classified under the official or unofficial agencies sponsoring them; and for the large number of university and college theses the faculty sponsor as well as the student is given. Good brief descriptions, indication of where the work is available and indexes make this a really valuable tool.

READING: A VISUAL TASK. By Matthew Luckeish and Frank K. Moss. New York (250 Fourth Ave.), Van Nostrand, 1942. 428 pp. illus. $5.

THOUGH not addressed particularly to architect or engineer, this book contains throughout material valuable to those charged with providing light for a civilization "evolving from a natural world of distant vision and casual near-vision to an artificial one of prolonged critical tests of near vision." Type, color and finish of paper, visual efficiencies and deficiencies, and specifications for optimum performance are presented in the fluid style well known to a generation for which Mr. Luckeish has averaged about a book a year.

BOMBS, BUILDINGS AND SHELTERS. By William H. Hayes. New York (2960 Broadway), Columbia Univ. Press, 1942. 83 pp. 4½ by 7 in. illus. $0.60. (Columbia Home Front Warbook 7).

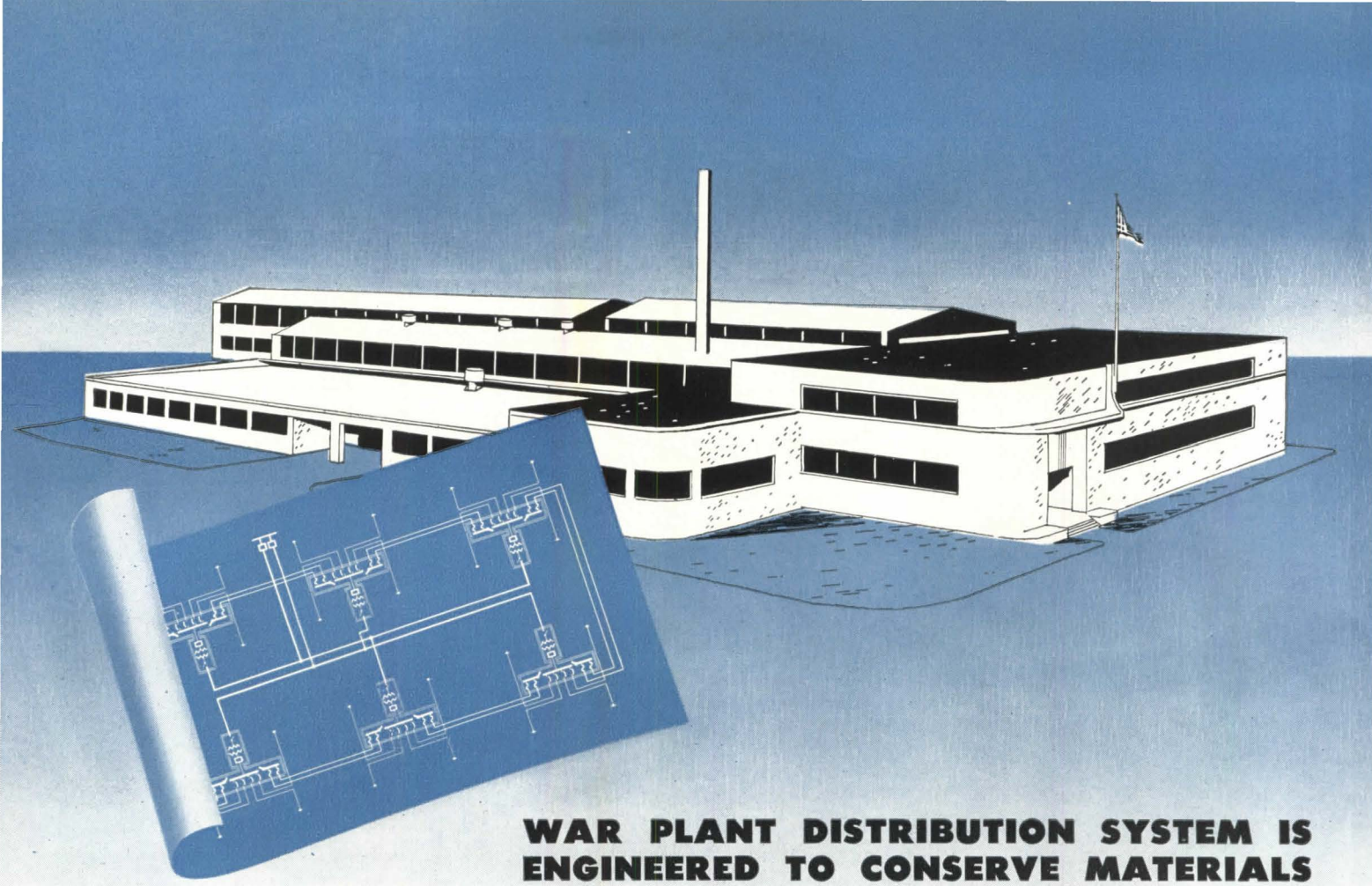
A NON-TECHNICAL presentation by a Columbia assistant professor of Architecture on ARP for the householder defending his home and family at a time when the increasing effectiveness of aerial warfare strikes hard at a people 90 per cent of whom are housed in isolated homes and many in unprotected apartments. The booklet, based on experience in teaching the subject, is well planned for the service of the layman; and to the digest of the best present thought and practice are added useful references to sources and to next-step technical material.

NEW EDITIONS

PLASTICS CATALOG, 1943. New York (144 East 42nd St.), Plastics Catalog Corp., 1942. 864 pp. 8¾ by 11¾ in. illus.

AN ENLARGED edition of a work which is at once a catalog of a product and a cyclopaedia of a rapidly developing industry. Nearly 200 cooperators from manufacturing firms and government departments contribute articles on materials processes and fin-

(continued on page 30)



WAR PLANT DISTRIBUTION SYSTEM IS ENGINEERED TO CONSERVE MATERIALS

Result:

6400 pounds of Copper saved

HOW WESTINGHOUSE CAN HELP YOU SAVE TIME AND CRITICAL MATERIALS

- **Selecting the Right System**—Wide application experience in all types of industries enables Westinghouse engineers to recommend the system best fitted to your plant.
- **Air-Cooled Transformers**—permit location close to load centers with maximum safety, eliminate expensive vaults.
- **Hipersil**—an exclusive Westinghouse development with ⅓ more flux-carrying capacity than ordinary silicon steel. Reduces transformer size and weight.
- **Loading by Copper Temperature**—permits use of *all* the transformer capacity, with complete protection against burnouts.
- **Improving Power Factor**—through use of capacitors, can often save installation of new feeder lines. Westinghouse engineers are in a position to make such practical recommendations.

A New England war plant planned to install a distribution system requiring 44,200 pounds of copper. Westinghouse engineers recommended a more flexible, better-protected system using 6400 pounds less copper.

Savings like this prove that "custom-fitting" the distribution system to the job helps to conserve critical materials.

There is no one universal distribution system suited to all plants or all industries. That's why Westinghouse plans and builds *all* types. The one that will best fit your plant is the one that takes full account of the nature, density, and location of load—with the least use of critical materials.

Any system recommended is designed to use standard distribution equipment. No time is lost in building special apparatus.

If you want fast action, call our local office. Or send for the helpful booklet shown below. Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

J-94539

QUICK FACTS ABOUT PLANT DISTRIBUTION SYSTEMS

Keep up to date on latest plant distribution systems. Send for Booklet B-3152 which briefly describes different plant distribution systems, and points out the advantages of each.

Westinghouse **PLANT DISTRIBUTION SYSTEMS**

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

REQUIRED READING

(continued from page 28)

ishes. There is a history of the industry as well as a list of selected references and a glossary. Curious is the decision to bind such a work with padded sides and a gilded leaf border strongly suggesting a book of hours reprint of, say, the Third Empire.

SOUTHERN YELLOW PINE: A manual of standard wood construction. 14th ed. New Orleans, Southern Pine Assoc., 1942. 179, xii pp. 4¼ by 6½ in. Tables, diags. $1.00.

REVISION of a standard work to cover the past five years' changes in the industry.

A. S. T. M. STANDARDS ON CEMENT. Philadelphia (260 Broad St.), Am. Soc. for Testing Materials, 1942. 119 pp. 6 by 9 in. illus. $1.35.

SIXTH edition of this handbook, covering specifications, chemical analysis, physical tests.

PERIODICAL LITERATURE

SCHOOLS. By C. G. Stillman. Architect's Journal. Cheam, Surrey, Eng. (45 The Avenue), Nov. 26, 1942. pp. 342-351; 339-40. illus.

MANY DIFFICULTIES in education are due to schools built to last a century, and ill adapted to changed requirements. The West Sussex County architect is designing elementary schools with many low buildings of flexible light steel construction with weight bearing columns permitting of extension shortening and re-arranging. Openings and walls are easily changed. The buildings are grouped round play and physical exercise courts, planting is designed to suggest a holiday camp. This design requires a larger site; but the extra cost is compensated for by the inexpensive construction, not costly to maintain and having high salvage value.

SOVIET ARCHITECTURE TODAY. By Edward Carter. Architectural Review. Cheam, England (45 The Avenue), Nov. 1942. pp. 104-114. illus.

A STUDY of Russian architecture of the past 15 years, illustrated with 30 photographs, many of them of buildings designed within the past 5 or 6 years, and showing "the apparent similarity of new Russian and new Fascist architecture, and the more alarming similarity between what Russia seems to like and what the city banks and the less adventurous [British] government departments and

(continued on page 32)

A new series of G-E advertisements (like the one shown here) are currently appearing in national magazines. To millions of eager American families, this series points the way *through War Bonds,* to the Victory Homes they dream of. And what's more, these advertisements make bright the promise of the *kind* of homes they will be . . . with *Better Living Built In.*

GENERAL ELECTRIC

REQUIRED READING

(continued from page 30)

municipal authorities favour." Succeeding the wholly anti-traditional and the international style of the West, seen in the first post-Revolution building, have come styles ranging from the neo-classic for public buildings—"the architecture of the Czar and the Court now made the people's"—to local vernaculars, which show spontaneity and variety, including, to cite but one, the Polyclinic at Anapa, a work of pure reminiscence, "which might easily be a Victorian whim somewhere in an English suburb."

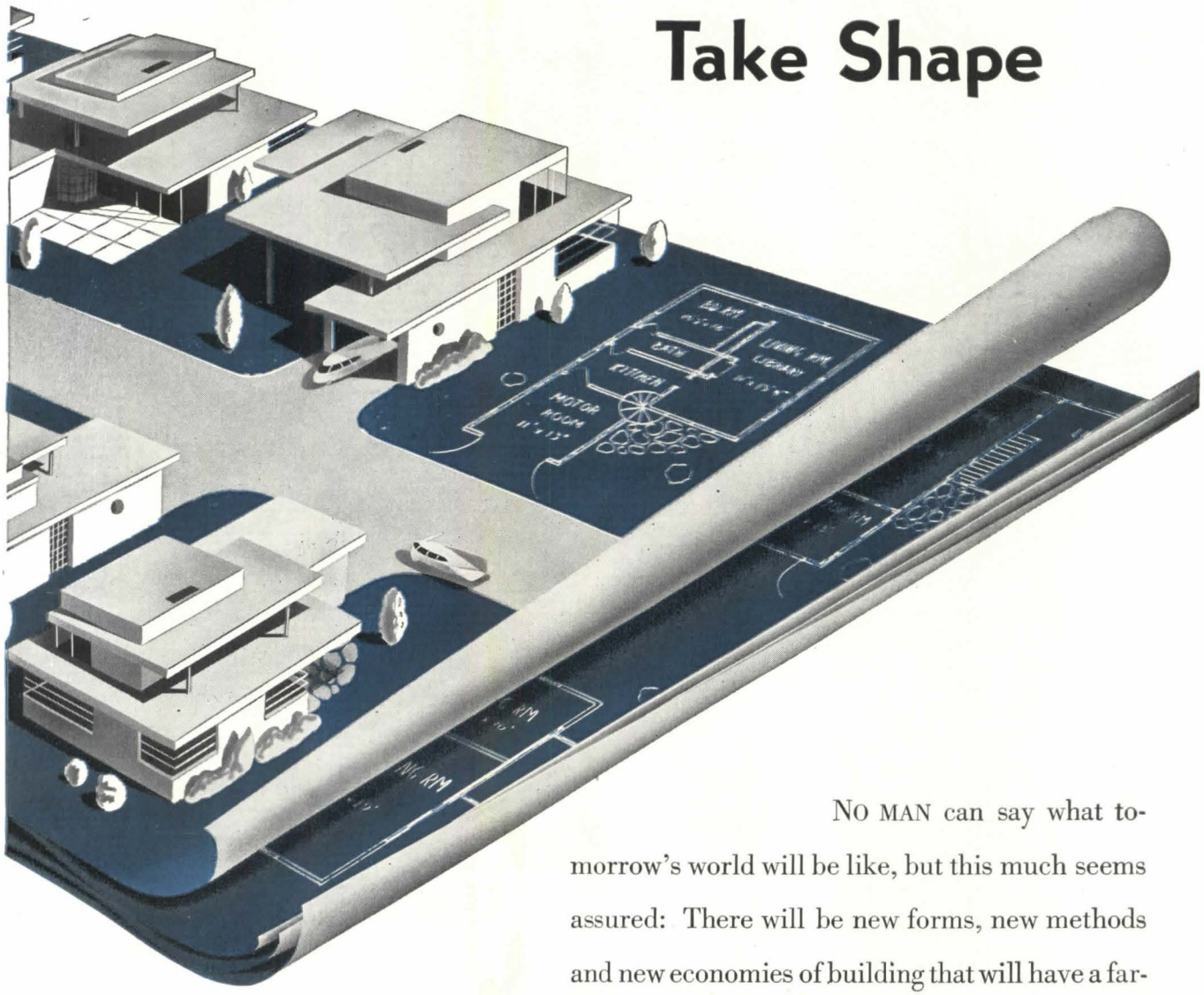
TEN CHURCHES IN SEARCH OF A SCHOLAR. By Dorothy Odenheimer. Magazine of Art. Washington, D. C. (Barr Bldg.), Nov. 1942. pp. 241-6. illus.

A PLEA FOR sending American research students to Mexico, a country with "an architecture that makes the art historian visually drunk," where 9,000 churches erected during 4 centuries have yet to be discovered although most of them are not far off the highroad, where Baroque churches are more numerous than those of Spain, and infinite richness is to be found on "the golden altars which bring heaven to earth."

EVIDENCE SUBMITTED BY THE R.I.B.A. TO THE . . . CENTRAL HOUSING ADVISORY COMMITTEE OF THE MINISTRY OF HEALTH. Journal of the Roy. Inst. of Brit. Architects, London (66 Portland Place, W.1), Oct. 1942. pp. 207-213. plans.

COMPREHENSIVE and forward looking recommendations for housing and town planning, urban and rural, with practical suggestions for next steps, based on a survey of inter-war and present day experience. "The practice of employing architectural assistants under the direction of engineers on work . . . predominantly social should cease. . . ." Highly competent specialized advice should be secured regionally and locally for direction, research and publicity. Means must be found to provide essentially comfortable and convenient accommodation, including good layout within the unit and avoidance of monotony for all types of groups and for single people. Apartments should not be thought of merely as crowding more people into the acreage, but rather as a better arrangement of units.

When Today's Visions Take Shape



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

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

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

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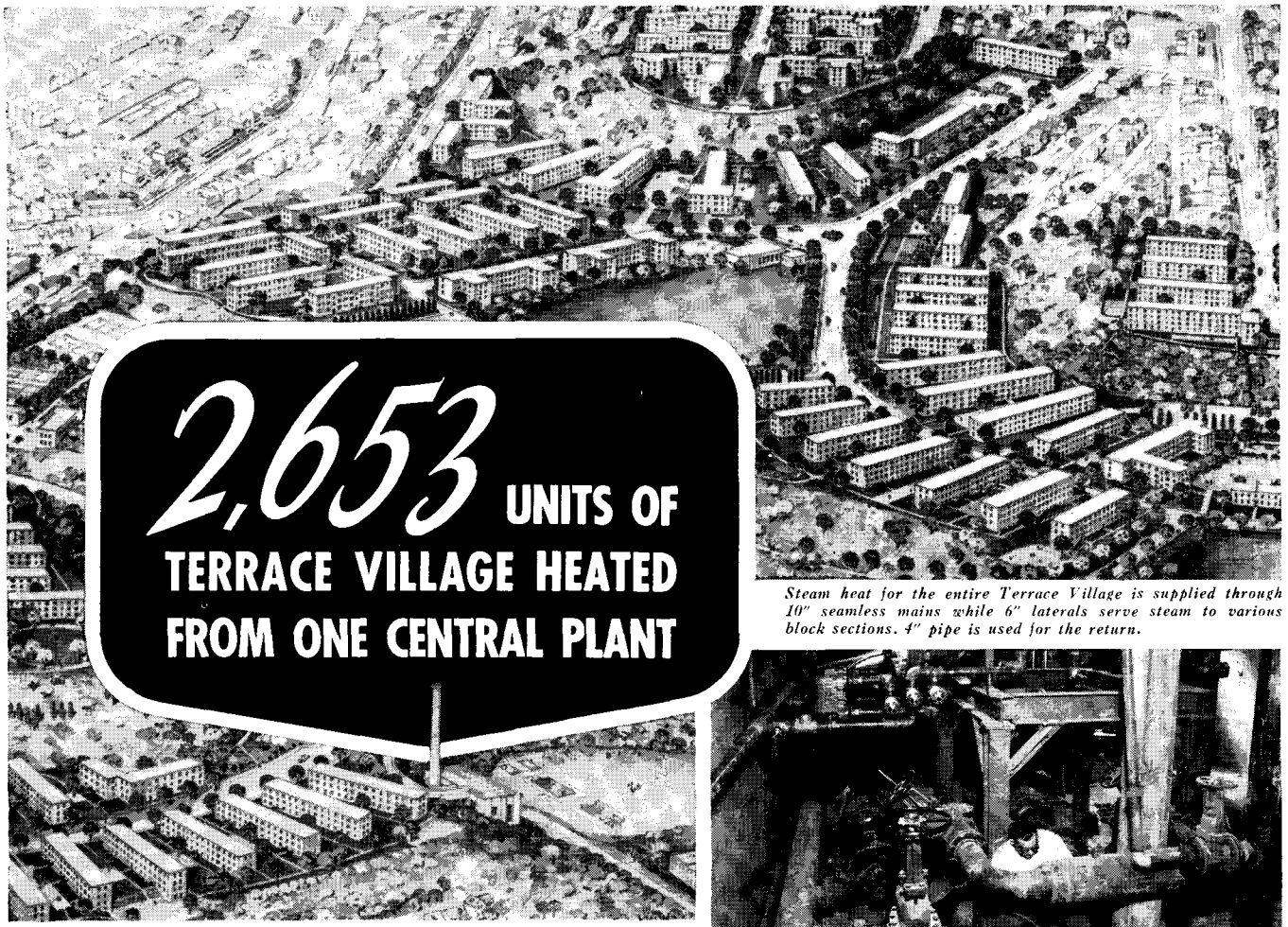

2,653 UNITS OF TERRACE VILLAGE HEATED FROM ONE CENTRAL PLANT

Steam heat for the entire Terrace Village is supplied through 10" seamless mains while 6" laterals serve steam to various block sections. 4" pipe is used for the return.

—*Major tonnage of pipe is*

NATIONAL!

TERRACE Village, Pittsburgh, is one of the nation's largest housing developments. It contains 2649 family units, 3 recreation and management units and 1 administration building—a total of 2653 units. All buildings are efficiently heated from one central boiler plant.

The development has been completed for more than a year, and heating throughout the entire community has been entirely satisfactory.

This shows that sound design, backed up by proved materials and good installation practice, brings sure results. The major tonnage of pipe for the heating was the same NATIONAL Pipe that has been giving good service for more than 50 years in all types of buildings. It has been improved, of course, from time to time with new methods and processes of manufacture.

Can you get such pipe today? Yes, if you are engaged on a war job which is helping to bring Victory. It's true that much of the pipe we make is going into such projects as the world's biggest oil line from Texas to New York . . . or huge quantities of new ships, trucks, tanks and jeeps, bombs and shells . . . but war housing developments, industrial plants, hospitals and military buildings are getting their share, too.

And in the future, as in the past, NATIONAL Pipe promises the greatest value per dollar of cost for any type of building project.

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

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TIMBEAM reduces the load of the beams and columns up to 50%, with the equivalent strength obtained from steel or solid wood members. This makes for economy in foundation design and fast and easy erection.

TIMBEAM is fire safe . . . affords minimum shrinkage and offers lasting qualities. It is a practical structural system, WPB approved, and is recognized as an accomplished advancement in engineering. WRITE FOR CATALOG.

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TIMBEAM, INC. 4086 Michigan Ave., DETROIT, MICH.

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

Concrete provides rugged strength *for* war structures

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.

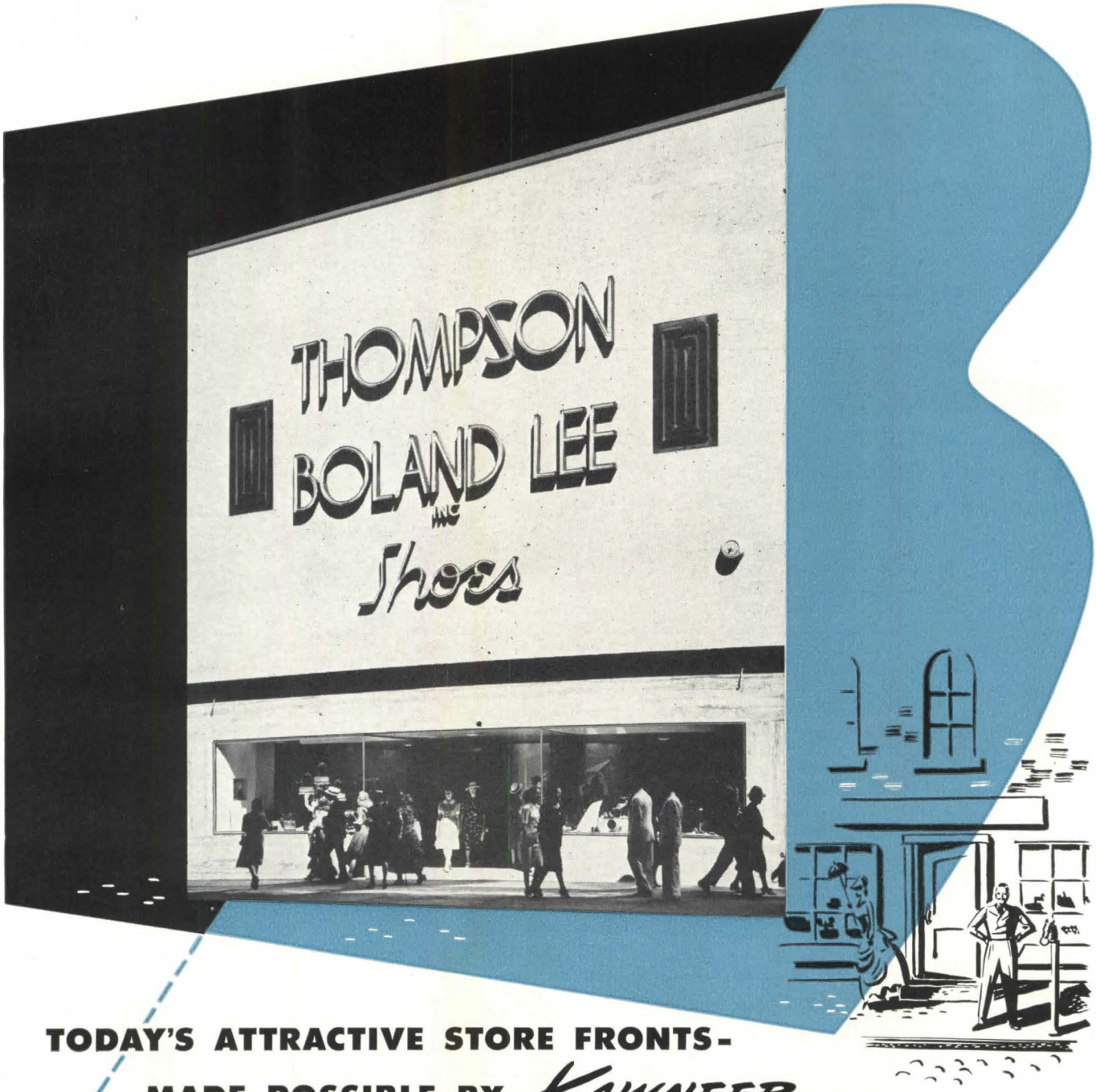
Designers of the huge Santee-Cooper power project used architectural concrete, placed in forms with absorptive lining.

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. A2-8, 33 W. Grand Ave., Chicago, Ill.

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



TODAY'S ATTRACTIVE STORE FRONTS- MADE POSSIBLE BY *Kawneer*

★ Back in 1905, the average store was without show-window display facilities—there was no store-front architecture as such, because no practical method of holding large plates of glass had been worked out. • But what a difference today! Much of the effectiveness of modern retailing is based on the display function of the up-to-date store front. Architects have met this problem, and the country abounds with splendid examples of their work. • All because the Kawneer Company was founded by a practicing architect who devised the first resilient, rustless metal store front. Although the Kawneer Company is now engaged in war work exclusively, a time will come—and before long—when new and better Kawneer Store Fronts will again be available. The Kawneer Company, Niles, Michigan.

Kawneer ORIGINATORS OF THE RUSTLESS METAL STORE FRONT AND ALL-ALUMINUM RESIDENTIAL WINDOW

Check Advantages of Prefabrication in

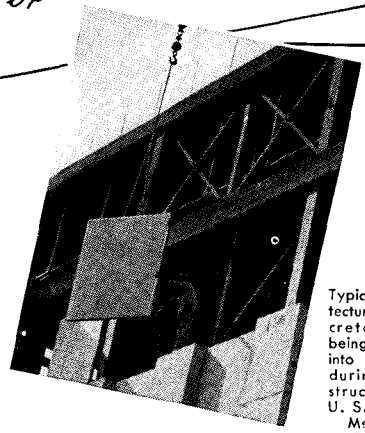
ARCHITECTURAL CONCRETE SLABS

ARCHITECTURAL CONCRETE SLABS

#1

Notes on the design, use and installation of Architectural Concrete Slabs...prefabricated building units for exteriors and interiors

Architectural Concrete Slabs are precast in almost any size and shape and so provide freedom of design plus speed and economy of erection.



Typical Architectural Concrete Slab being swung into position during construction of U. S. Naval Medical Center.

THE use of thin, precast slabs, a structural and decorative material for exteriors and interiors of buildings and engineering structures, has grown rapidly. This material will bring the benefits of prefabrication to many commercial, public, and engineering structures now being planned for postwar construction. Formed in a mold and strongly reinforced, these slabs, while only 2″ thick, are precast in sizes up to 100 sq. ft. or more in area. Unusual, attractive texture may be provided by a facing of exposed aggregates imbedded in a matrix of white cement.

Check some of the important advantages of prefabrication which these thin slabs provide.

Freedom of Design

You can secure new, attractive color and texture in concrete construction; increase the scale of the design; provide the dignity and permanence of large units; and obtain these results economically. Slabs may be cast to almost any desired profile, and so may be "wrapped" around corners, window reveals and sills. In multi-story buildings, spandrels extending from one window head to the sill above may be made in a single piece.

Factory Control

Factory fabrication permits refinements in methods, materials, and proportioning. Vibration produces strong, dense concrete. Low water-cement ratio assures high strength and durability. Relative thinness of slabs (usually about 2″ thick) permits uniform curing. Because repetitive patterns may be cast from a single mold, the economy of mass production is provided.

Ease of Erection

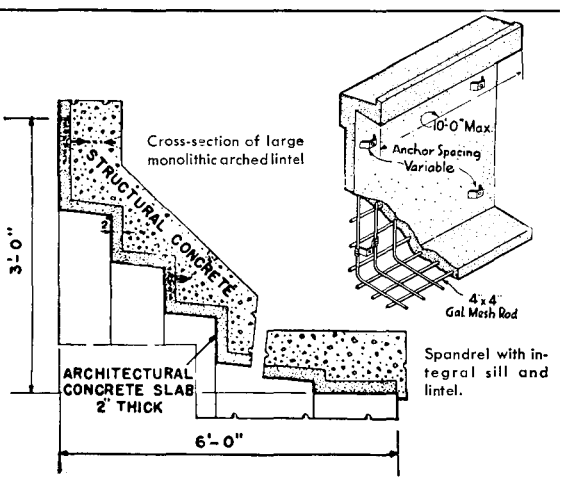
Convenience in handling is the only practical limit to the size of these prefabricated slabs. Erection consists of constructing, not square inches, but *square feet*. Costs for flashing and waterproofing are held to a minimum because the number of joints is greatly reduced. Slabs are light in weight (about 25 lb. per sq. ft.) and are handled by ordinary stone setting derricks. Installation, by regular masons, requires no special training, but must be adequately supervised. Except for pointing and cleaning, no other surface treatment is required at the job.

"Architectural Concrete Slabs" is the title of a 28-page book containing detailed drawings, full-color illustrations, installation pictures, and complete descriptions. Write for your copy today. Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York.

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

AR-ACS-37

On the David W. Taylor Model (Ship-Testing) Basin for the U. S. Navy, the facing slabs were used as exterior forms for the structural concrete, reducing scaffolding and job forming.



Prefabricated

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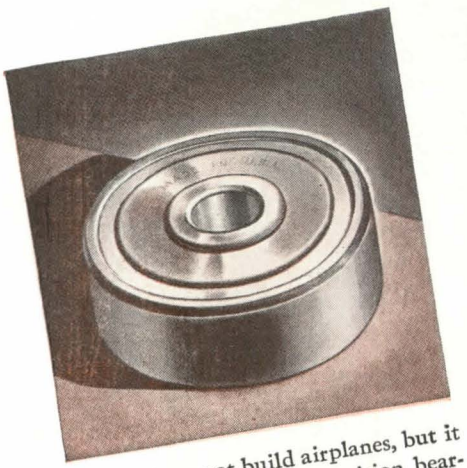
FIRE stops work . . . 1000 miles away!

THE HAZARD OF FIRE is a multiple threat to industry . . . and to the war effort. When it strikes it may destroy irreplaceable buildings, equipment and materials. It may paralyze production in the plant in which it occurs. But even more important, it may halt vital war production lines *miles away!*

Take the case of the stalled airplane assembly line . . .



Plant A does not build airplanes, but it does make an essential precision bearing, part of a famous bomber.

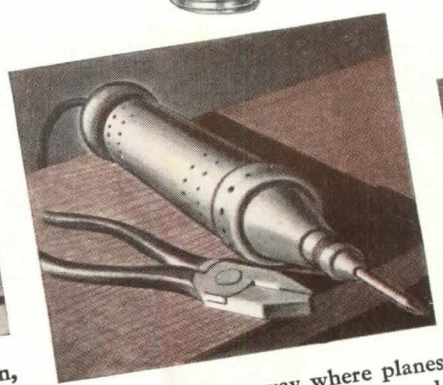
GRINNELL

AUTOMATIC SPRINKLERS

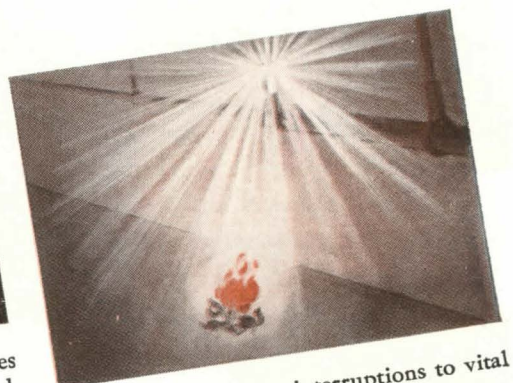
For Production Protection

Don't wait until it is too late. Call your nearby Grinnell office, or write to Grinnell Company, Inc., Executive Offices, Providence, R. I. Branch offices in principal cities.

Due to inadequate fire protection, Plant A burns, destroying the bearings in production as well as the machines to make them.



In Plant B miles away where planes are assembled, work comes to a standstill. Lack of bearings sabotages production as completely as Hitler himself would do it.



Don't risk damage or interruptions to vital war effort! Block fire the one *sure* way . . . by the system that controls fire at its source, *automatically! By Grinnell Sprinkler Systems!*

EVERY American-made shell stabbing through today's Axis landscape carries a promise . . . of plenty more coming . . . from an America now producing more than the enemy ever bargained for.

The thunder of our guns, daily more deafening to Berlin and Tokyo, voices the war-time industrial might of our factories and shipyards—turning mountains of raw materials into an endless and overwhelming flood of shells...ships...torpedoes...tanks...planes. In plants of all types throughout America, Todd Combustion Equipment is contributing to efficient, trouble-free power-production . . . maintaining unsurpassed standards in the combustion of liquid and gaseous fuels.

With over 50 thousand units now in active industrial and commercial service, Todd technical staffs . . . with parts and replacements instantly available in key cities . . . are cooperating with plant engineers responsible for uninterrupted firing on the vital power-production front.

ARMY NAVY

Production for Victory . . . Buy U.S. War Bonds

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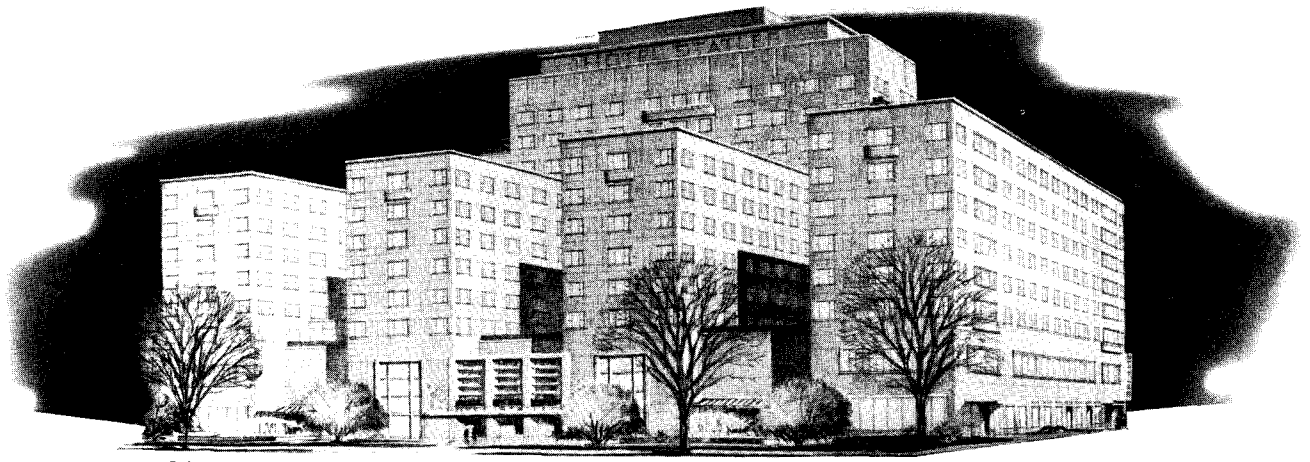
TODD NEW YORK, U.S.A.

NEW YORK MOBILE NEW ORLEANS GALVESTON SEATTLE BUENOS AIRES LONDON



John W. Harris Assoc. Inc., New York City
General Contractors

Holabird & Root, Chicago and New York
Architects

Washington's Hotel Statler

FEATURES

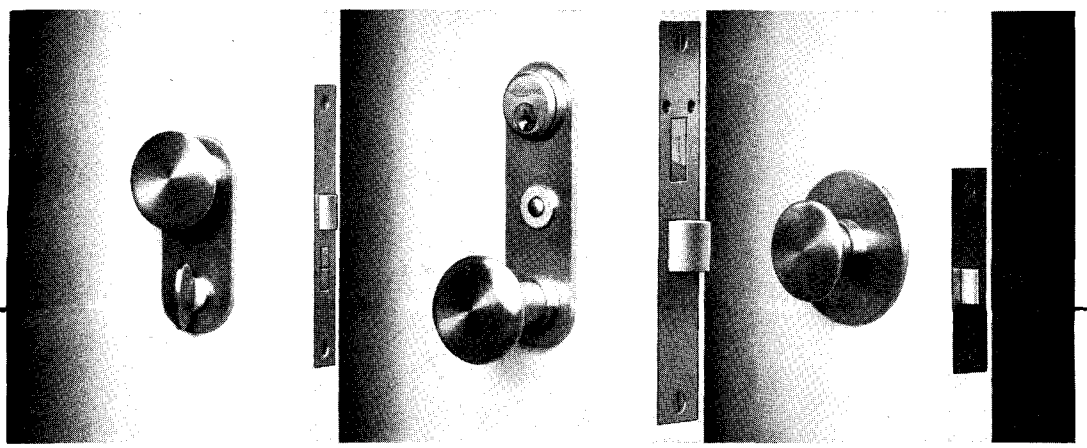
LOCKWOOD HARDWARE

Plans for the interior of this magnificent new building called for very special hardware . . . styled to fit a pattern of dignified simplicity, yet rugged enough to withstand continuous hard use.

Lockwood experts made a thorough study of the special designs conceived by the architects. Then, Lockwood's famous talent for achieving new and strikingly different effects in builders' hardware was pressed into service.

Note the graceful contours of the escutcheon and roseplate assemblies, shown below. An unusual method of attachment makes screws totally invisible, permitting a smooth, unbroken surface. Unexcelled materials, fashioned with traditional Lockwood skill, assure long, trouble-free service. In every respect, these handsome models bear out the architect's original conception.

The way we co-operated with the architects on this job is typical of the way we'll work with you.



For guest room doors on the corridors (*center*), a long, smooth escutcheon plate with rounded ends. Note the absence of screws. For non-locking doors (*right*), a graceful knob rose, unbroken by screws. For intercommunicating doors (*left*), a briefer escutcheon, with a simple thumb turn.

Lockwood Hardware Mfg. Co.

Division of Independent Lock Co. **Fitchburg, Massachusetts**

Important Note

to Certain Users of the Nesbitt Syncretizer

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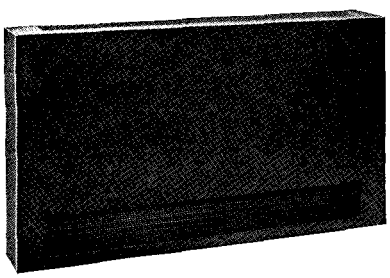
FOR many years the Nesbitt Syncretizer has been called "TOMORROW'S Heating and Ventilating Unit TODAY." You were told "Nesbitt Syncretizers installed today in a state requiring the circulation of all outdoor air will TOMORROW save up to 70 per cent of the fuel used for ventilating when the state's laws are revised to permit the combination of recirculated room air and outdoor air." That promise is being kept. In many states TOMORROW IS HERE!

In the face of fuel shortages and high prices, your Nesbitt Syncretizers may save the day! You may now be able to take advantage of the *convertibility feature* which Nesbitt foresight built into the Syncretizer to permit the partial recirculation of room air and thus reduce your fuel bill. If your state permits this and you are not taking advantage of it, let us tell you how to go about converting your units to this new cycle of control without sacrificing health or comfort. Write today.



Nesbitt Syncretizer with Non-Metallic Casing Now Available for Certain Essential Projects.

TOMORROW . . . TODAY

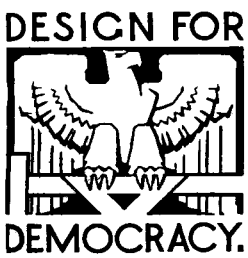
Nesbitt foresight is paying rich dividends now for many school boards throughout the country by assuring fuel economy while providing dependable performance and maximum health and schoolroom comfort. When peacetime construction is resumed, choose the ventilating unit that is built for TOMORROW as well as for TODAY . . . NESBITT SYNCRETIZER.

NESBITT SYNCRETIZED AIR

"Tomorrow's Heating and Ventilating Unit Today"

The Nesbitt Syncretizer is made and sold by John J. Nesbitt, Inc., Holmesburg, Philadelphia, Pa., and 11 Park Place, New York City; and is also sold by American Blower Corporation

TODAY'S OPPORTUNITIES



IN 1943, we are presented with opportunities which it would be fatal to miss! Even though the efforts of most of us are directed in the unusual tasks of war, we do have now—and only now—the opportunity of preparing for the immense task of the future, for preparing both ourselves and our plans to meet the tremendous demand for building which will come when destruction ceases and construction begins.

✦ Whether that time is nearer than we dare hope, or years hence, whether it comes suddenly or gradually, the creative forces of the building industry must get ready both individually and collectively, for the work of providing new homes and schools, hospitals and churches, airports and stations, stores and offices, power plants and factories. We cannot wait for the war to end. Then it will be too late. It is incumbent on each and every architect and engineer to prepare himself for tasks that lie ahead. There will be demands for more efficient service than ever before, for faster work and more completely coordinated services.

✦ The demands will be for men and organizations that can arrange, enclose and condition space efficiently, economically, rapidly, conveniently, attractively. This is the function of the professional team—the architect-engineer organization equipped with the knowledge, training, and experience to perform this complete primary planning which must precede all actual construction.

✦ The cessation of all private building provides the opportunity of perfecting the architectural organization to include experts and consultants in the technical, business, and other departments of the work. It gives the architect the opportunity of becoming more familiar with the underlying factors that control all building. It gives him also the time to keep up with the trends and changes, both in these factors and in the materials and techniques of building. The war's acceleration of invention is putting new products, new sub-assemblies, new and faster building processes, in the hands of the designers and coordinators of building.

✦ In addition, there is the opportunity for public service in the community. For every community can now, without interrupting the work of winning the war, examine its present facilities and its probable future needs, and then make its plans for both its immediate and its long-term development in the light of the economic probabilities. In this, architects and engineers can now play a leading role, and their public service at this time will assure the more orderly development in which they will participate.

✦ Actual planning of specific buildings need not be deferred for the duration. The planning of buildings for peace-time use has not ceased but is on the increase. Factual reports in our possession show that more than one-billion-dollars-worth of new buildings are in plan stages now for construction when materials and equipment are again available. The advantages of planning actual structures *now,* for future building, is being realized by more and more organizations, municipalities, institutions, entrepreneurs, and private owners. They can, and are, benefiting by the personal attention and comparatively greater time that many architects and engineers can give to their problems *now,* before the rush of work makes such consideration impossible.

✦ Today's opportunities are therefore five fold—pentagonal, if you will—and they lie in (1) planning buildings now for future construction, (2) reorganizing firms to render the most efficient and complete services possible, (3) becoming familiar with new and more efficient building products and methods, (4) engaging in community and industry postwar planning activities and (5) establishing thus the soundest basis for making known to the public the value of the indispensable functions of the architect and engineer. The question, then, for each of us to ask himself is, "What am I doing about these opportunities?"

Kenneth K. Stowell

EDITOR-IN-CHIEF

PLANNED COMMUNITIES

A SPECULATIVE SURVEY OF THEIR FUTURE

BY ROLAND WANK, A.I.A.

Editor's Note:—Basic problems, such as land control, which determine the future of planned communities, are definitely the concern of architects and engineers. Last month we presented the thinking of Thomas Mackesey and Gilmore D. Clarke, who find hope for solutions in such cooperative possibilities as are provided by the Urban Redevelopment Corporation Laws. Here we present the personal views of Roland Wank who has had wide experience, from its beginning, with the country's great government-controlled regional planning project, the Tennessee Valley Authority.

THAT AMERICA will some day exchange its present dwelling places for bright and efficient communities is an article of faith with those of us who do not believe that progress can be permanently denied. The squalor and decay, the disorganization in which luxuries are cheap but necessities beyond reach, shall yield to surroundings designed for efficient work, healthy recreation, and opportunity for children to grow up happy and straight.

But articles of faith do not come with time-tables for the promise of fulfillment; yet the detailed characteristics of the new towns depend on that. The concept of the good life changes with the evolution of technical prowess and social attitudes; and with it, change physical requirements. In the meantime, let us explore the basic framework which must be laid for the creation and design of planned communities.

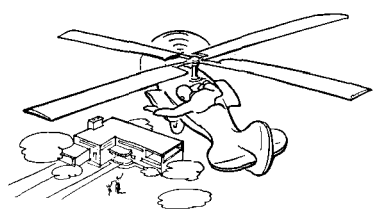
II

In the midst of a world war one cannot avoid wondering whether the life-and-death facts of warfare will lead to lasting changes in the principles of town planning. To quote Dorothy Thompson's taxi driver, "the war may last a lot longer than the duration." In the judgment of some responsible members of the military services, all future construction should take into account the possibility of sudden attack, anywhere, for an indefinite period.

Now design for merely staying alive differs a lot from design for living. Assuming the constant danger of aerial bombardment, the best defense of towns and cities would be utmost drabness of detail and lack of identifiable organization. Vital structures, normally focal points of planning as symbols of civic pride or productive power, would burrow underground or otherwise pretend to be nonexistent. Sites endowed with special advantages, such as hilltops, waterfronts, highway intersections, would be shunned like pestholes. Should this philosophy be accepted to rule the town planning practices of tomorrow?

Humbly admitting the possibility of error, it is contended that there is no need—yet—to throw our hard-won heritage overboard. Future necessity depends upon the kind of world order which will follow the phase of open warfare. If it rests on a working degree of satisfaction among all peoples, with a light police force to check a few recalcitrants, mankind can return to its main task of building civilization. If it is an uneasy peace maintained by sheer brutal force, we will indeed live under the restrictions of an armed camp. But if that comes to pass, we may stop worrying about planned communities. Neither the frame of mind responsible for that kind of world order nor the allocation of productive capacities suited thereto would be conducive to any large-scale improvements for human welfare.

On the other hand, peacetime uses of the airplane should also receive passing reference. Not because use will affect the competitive position and relative growth of population centers, nor because aerial commuting may affect their detailed layout; but because even the generalized approach of this article should recognize the undeniable possibility that once technical improvements place planes on a par with automobiles for all-around utility,



our entire concept of settlement patterns may change with a far-reaching interfusion of town and countryside. All current principles of city planning would then be obsolete. The lay public, with its often accurate intuition, expects some such development; and new aircraft designs, now shrouded in military secrecy, may promote it. Still, on the basis of facts now known about the characteristics of planes, their dependence upon weather, and the requirements of their landing fields, it does not seem practical to do more than place this problem on a shelf—preferably on a conspicuous one where it can be kept under constant observation.

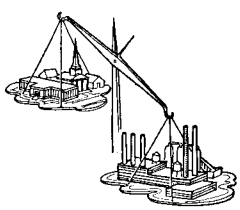
III

For a start towards investigation of the habits and habitats of a planned community let us attempt to set down some of its earmarks.

Firstly, it is a community the functions of which are well enough defined so that the number, preferences, and activities of its inhabitants can be forecast within fairly narrow limits.

Secondly, its design must take into account all physical facilities, services, and opportunities for a fully rounded life. Provisions need to be interrelated and balanced so there is no wasteful excess in one or insufficiency in the other. Because no community is large enough to encompass all requirements, the planner's task is in part to make proper allocations between needs to be satisfied within the community, and in part to relate the community as a whole to the services and satisfactions for which it depends on other sources. The latter part of the task is vital in the location of the project and in establishing the scope of its self-containment.

Thirdly, because few communities remain static in size or in composition, the original plan must provide space and orderly procedure for expansion, contraction or shift in character while maintaining balance in all basic facilities.



Nothing in the above limits the size of a community for the purpose of integrated planning. Since the language itself is ambiguous, it might be well to attempt a definition. The minimum might be a group of structures which are served with regard to at least one important requirement (e.g., school) by a facility of their own. The maximum might be an aggregation of partially self-contained communities which depend for the satisfaction of at least one important requirement (e.g., college or department store) on common facilities within daily reach.

Size is significant primarily as it reflects upon self-containment, i.e., the proportion of essential functions which should be provided within the community and become subject to control by its planners. For the remainder, regional plans (and if we could just raise our sights that high, a national plan) would be vitally helpful in the planning of individual communities.

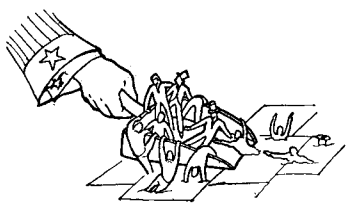
It might be well, also, to mention some of the things that planned communities will not do, and which, when promised by enthusiasts, only becloud the issue. Except through employment incident to their construction, and indirectly through raising better citizens, planned communities will not reduce unemployment or eliminate poverty. Nor should we look to them for ersatz security—subsistence farming for instance. A widespread effort to plan our communities would be evidence of, and in many ways a potent tool of, a national resolve to bring our destiny under control; but not a substitute for it.

IV

That such high resolution will be necessary before planned communities emerge in any numbers becomes obvious when one contemplates the steps to be taken.

For comprehensive balancing of all factors which make an organic community, the first requirement is unhampered disposition of land use. Tentative steps of the past, such as zoning and subdivision control, show up as failures in retrospect; they compromised the public interest too far in the effort to minimize interference with property owners.

Among planners hopeful to evade the issue, there are advocates of new communities on open land, the cost of which is low enough to be disregarded for practical purposes. Another school of thought looks to the Federal Government for bailing out property owners in limited



portions of urban areas, to be resold for piecemeal reconstruction. Projects along either line are bound to be valuable proving grounds for ideas, training for planners, opportunities to show the public the shape of things within its reach. But as attempts for a painless detour around the problem, both approaches must peter out, and for the same reason: if carried to any volume either would deflate property values quite as effectively as direct expropriation at reduced valuations.

With a flattening population curve, new land placed into use means destruction of present or prospective utility for equivalent land in current use or held for investment. Similarly, with population growth evaporating from within the corporate limits of municipalities, derelict sections rebuilt for more profitable use destroy the equivalent actual or expected profitability of other areas. When this occurs in the normal course of business, no one can be held accountable (although there may be plenty of recriminations, as in the case of Rockefeller Center). But if public subsidies were used for the purpose, it wouldn't be long till the cry of confiscation would be raised by non-participants.

Besides, there is room for doubt whether piecemeal reconstruction could ever be harnessed to the cause of comprehensive replanning. The incentive to rebuild neighborhoods as a matter of sound private business varies inversely with the adequacy of over-all planning controls. A few strategically located slums of each city might properly rate intensive and therefore lucrative development; would probably attain it eventually anyhow. But most fallow or deteriorated sections could aspire only to low density or open uses, by the simple arithmetic of population divided by available land. Official programs would be sabotaged out of existence if they recognized this fact; witness the fate of the genteel master plan proposed for the City of New York by its Planning Commission.

Assuming then that any freedom in planning for land

use implies devaluation of the whole structure of land prices (although not necessarily of every particular piece of property) the choice between new starts vs. reconstruction can be examined as a technical problem.

Some brand-new settlements in remote locations may

continue to crop up for special reasons; but by and large new communities for old are needed within the orbits of established population centers. Metropolitan areas had natural reasons for being where they are, and the reasons, while they may be less or more cogent today, are still valid. Utilities and public services have a salvage value. While some obsolete street layouts, utility branches or schools may have to be scrapped in rebuilding, duplication of water supply, colleges, hospitals, harbor facilities, and other major works seems indefensible. Lastly, there is the going concern value of established population centers: the chance to progress gradually and to avoid dislocations which would attend the complete uprooting of persons, industries and commerce.

It would follow that if planned communities will ever progress from the status of odd exceptions to become the normal habitat of the American citizen, most of them must perforce be created within metropolitan areas, probably and preferably also within corporate limits. What then are the prospects for the necessary fluidity of land, and how well does our present machinery serve the objective?

V

The simple fact is that total property in the United States either in intensive use (or priced in its expectation) exceeds the amount for which such use can be anticipated. The sum of all valuations is therefore watered and must be squeezed out before replanning at any scale can be undertaken. It was already indicated that bailing out with public funds may not work any too well unless it were carried to the extent where substantially all owners of dubious property would share the largesse (and more and more property would become dubious under the competition of parcels so acquired and returned to use at deflated valuations).

The morality of swapping public funds for water is defended on the grounds that actually or ideologically every citizen was an accomplice to the real estate speculations of the past. But the proposal should be sized up also for its dangers as a precedent. The principle of public indemnity for expected but unrealized (and in the aggregate unrealizable) profits may well prove fatal if applied to all investments which may become affected by necessary adjustments to a future world order.

At any rate, it seems at least doubtful whether the public in its present frame of mind would support such expenditures. The postwar national debt will combine with opposition to public ownership of land, which opposition has long and carefully been nurtured by the real estate interests. It is not contended that the climate of opinion will never change; merely that a change adequate for the purpose would be somewhat of a revolution and could hardly take place without deep and conscious dissatisfaction with communities as they are, and understanding of

what they could be. If we accept this, as the English are doing, and presume that such profound change is likely, it may be in order to examine alternatives for a sounder basis on which to plan communities of the future.

It is unfortunate that local governments which should lead the public in the exercise of bold foresight are helplessly committed to inflated property valuation through the peculiarities of taxation and financing. The circle from municipal to near-bankruptcy to suburban exodus to community decay and back again can hardly be broken without fundamental revisions in the territorial concept of municipalities, their revenue sources and the theory of land appraisal.

VI

To begin with, the corporate limits of municipalities must seem obsolete irrelevancies to any unprejudiced observer of the modern metropolis. The only feasible basis of planning is the metropolitan area; it is equally obvious that other kinds of civic and political action must likewise be based on areas in fact interrelated as a single unit—tradition and legal fiction notwithstanding.

Having postulated that point, it may be assumed that the taxing power of the metropolis could then recoup the bulk of the suburban values created by metropolitan action —such as exist by virtue of the parent city as a place of work, shopping, or cultural and public services. With a broader base, a first dent could be made in the habitual overvaluation of land. Opportunity for planned control of development in the entire area could in time reduce unnecessary decentralization and thus lessen the need for revenue or borrowing.

The next factor which invites examination as a possible anachronism is the dependence on real estate as the major source of revenue. Contemporary ways of life made the relation of income to the piece of land over which it is made increasingly fictitious, and often entirely unstable from year to year. At least a partial shift seems in the cards; after which taxes remaining on real property could be shaped with more freedom for socially desirable ends.

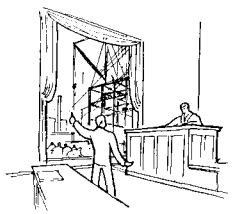
But after everything possible has been done to ease the consequences of realistic valuation upon municipal finances, there still remains the need for a fresh theory of valuation for purchase of property to be replanned.

Since present valuations are compounded from decades

(if not centuries) of hope, speculation, good and bad judgment, suggestions that really cut through the tangle may appear too radical, while those which remain prudently cautious are likely to be ineffective. The thoughts following here are presented without any delusions as to their chances of being adopted, but with the conviction that no less thorough-going scheme will do the job.

As we know, the sum total of all "market values" is quite beyond the capacity of communities to validate. But in reverse the total value of property could be deduced much more realistically. With some oversimplification it may be suggested to compute the total earning capacity of the community, which is of course the only ultimate source of value and remains fairly stable over long periods. Fair ratios of rent to income and applicable interest rates could be derived from the past. A total capital value, even if liberally estimated on that basis would come far closer and could be checked against other statistical indices.

Next, total value would be allocated between all properties, an equally difficult task. The simplest procedure would be to adjust assessed valuations proportionately. This would be arbitrary, but no more so than the manner in which taxes are now apportioned. Corrections could be allowed for manifest inequities. As in any procedure involving judgment, long litigations may be expected, but need not necessarily delay replanning and reconstruction.



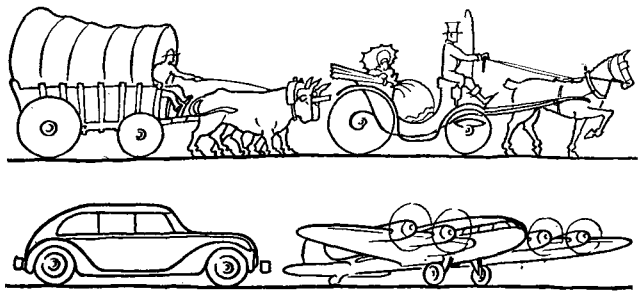
In any process of devaluation, whether accidental or planned, innocent bystanders are hit. A planned procedure would at least offer an opportunity to recognize bona fide hardship cases and compensate them as such. This would be a more effective and cheaper method to protect widows and orphans than indiscriminate support of an artificial price level, let the benefits fall where they may.

There are a few existing devices which could contribute toward the same objective, as exercise of police power over unfit structures or retainment of tax-reverted property. But by past indications effective use of such tools cannot be expected until the man on the street has made up his mind that he wants the job done and told his officials to go ahead with it.

VII

When by one device or another new lands or derelict areas become available for replanning, that function should remain vested in public authorities. Private enterprise will no doubt continue on its time-honored jobs of design and construction, directed by the over-all plan; and, with emphasis on investment instead of speculation, should erect and operate the bulk of industrial, commercial and residential structures. But community planning proper must be exercised in the interest of all citizens and is therefore a governmental function. It involves setting standards and complete coordination for all services furnished by a multitude of public agencies or by corporations operating under public franchise; conflicts must be resolved between development for maximum profitability and for social objectives, health requirements and amenities. Great initial investment will have to be carried through years of the developmental period, and a large part of the total goes for public streets, parks, utilities and buildings.

Naturally, the public will want to recover as much of the investment as is consistent with sound policy. Conservative opinion favors return of replanned property to private ownership; but planners can hardly be blamed for wishing to avoid repetition of the present mess which doubtlessly would follow a reversion to the old ways.



Flexibility for continued adaptation of the community to changing conditions is essential to maintain in force the advantages originally gained by planning; and flexibility requires continued freedom in the redisposition of land.

Barring resale, liquidation of investment would come from the leasing of ground, which would also take the place of land taxes and would extend over periods appropriate to the proposed uses. Five or ten years with renewal clauses may suit a filling station, for example, while a residence may require twenty-five, and a department store or factory still longer. Not all of the original cost would be directly liquidated, of course, from ground rents. To begin with, there are public spaces and structures (although other governmental units which occupy space in the planned community would presumably lease it just as they buy land in ordinary cities). Most property devoted to recreational, cultural and health purposes is normally tax exempt; under modern trends more and more of it is likely to be taken into direct public operation.

The remaining occupancies of land should, in general, pay their own way and carry their share of non-liquidating public investments, either through ground rent or by additional taxes. Certainly, industrial and commercial enterprises should, but some caution may be in order. Industrial location has frequently been influenced by subsidies in the past, and planned communities may feel impelled to play the same game unless some national guidance is in effect, perhaps as a carryover from wartime controls.

Experience with a few of the planned communities which already exist indicates that a somewhat analogous situation may exist during the initial stages with regard to commercial enterprises. Cut-rate competition from written-down properties just beyond the project limits may make the sledding tough for merchants or professional men paying normal rent and maintaining reasonable standards with-

in the community. But as planned communities spread over more land and controls on land use take hold, this threat would eventually disappear.

Residential properties pose more complications. In a perfect economy everyone who has an income at all would be able to pay for decent housing; to the aged, sick, and other wards of society the means would be supplied by a system of social security. But our present policies deal with low-rent housing as a separate problem, leading to one of the conflicts characteristic of our confused state of affairs: low-rent projects, because they are planned in large units, are superior to normal housing of much greater cost. By and large, they approach the residential standards that may be expected in planned communities.

Because the latter are likely to replace derelict areas and thus wipe out low-rent slums, and in any case because they must not discriminate against low income, there is bound to arise a problem of differential rents among residential accommodations which differ little in desirability. Maintenance of designated blocks for subsidized rentals would fly in the face of our entire concept of democracy, depress morale and create new special pressure groups. Moreover, as in present public housing, it would lead to tragi-comic situations when the income of a tenant having improved, he faces eviction for having made good. Makeshift remedies are bound to have a disagreeable taste. Different income groups could be interspersed by individual adjustment of rents to tenant income; administratively, an almost insuperable nuisance. Rent doles for persons of low income would be almost equally difficult and much more demoralizing. More radical solutions, unpalatable to public opinion, would extend public housing much higher up the income ladder with gradually decreasing benefits to bridge the gulch.

In any case, while planned communities are bound to improve residential conditions at all levels, they will not, and should not be expected to cure the fundamental indignities of insufficient income and family insecurity.

VIII

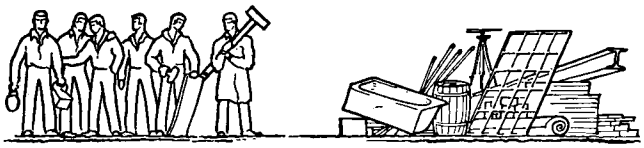
Nor, as a matter of fact, can a single project or a few here and there affect social and economic conditions at large. But a long-term, determined national program to rebuild America could.

It should be evident that participation of private and public enterprise in planned communities and the ultimate division of their jurisdictions would not differ greatly from present practice except insofar as order would be created from confusion by subjecting land development to social control. While speculators would have to turn toward other pastures, enormous fields would be opened up for private investment, which, in planned communities, would be as stable as society can make it. The threat of wholesale municipal bankruptcies would be eliminated from the economic fabric. Rate of investment could be directed as the national interest demands; and with a *significant* fraction of economic activity under control, there would be greater incentive for the building industry to rationalize. Stable programs would permit labor to consider annual wages and otherwise improve conditions to employment. Apprentice training could be adapted to known needs. Large-scale capital and expert management would be given opportunity to integrate the construction industry, to tool up and develop new products for assured markets. In short, the whole program would furnish a gigantic flywheel to assist in bridling our catastrophic ups and downs.

IX

To recast a major portion of our population centers into the shape of planned communities would be, physically, a collossal task. But this nation delights in the colossal. Paul Bunyan is our legendary hero; Henry Kaiser can tie General McArthur for popular esteem.

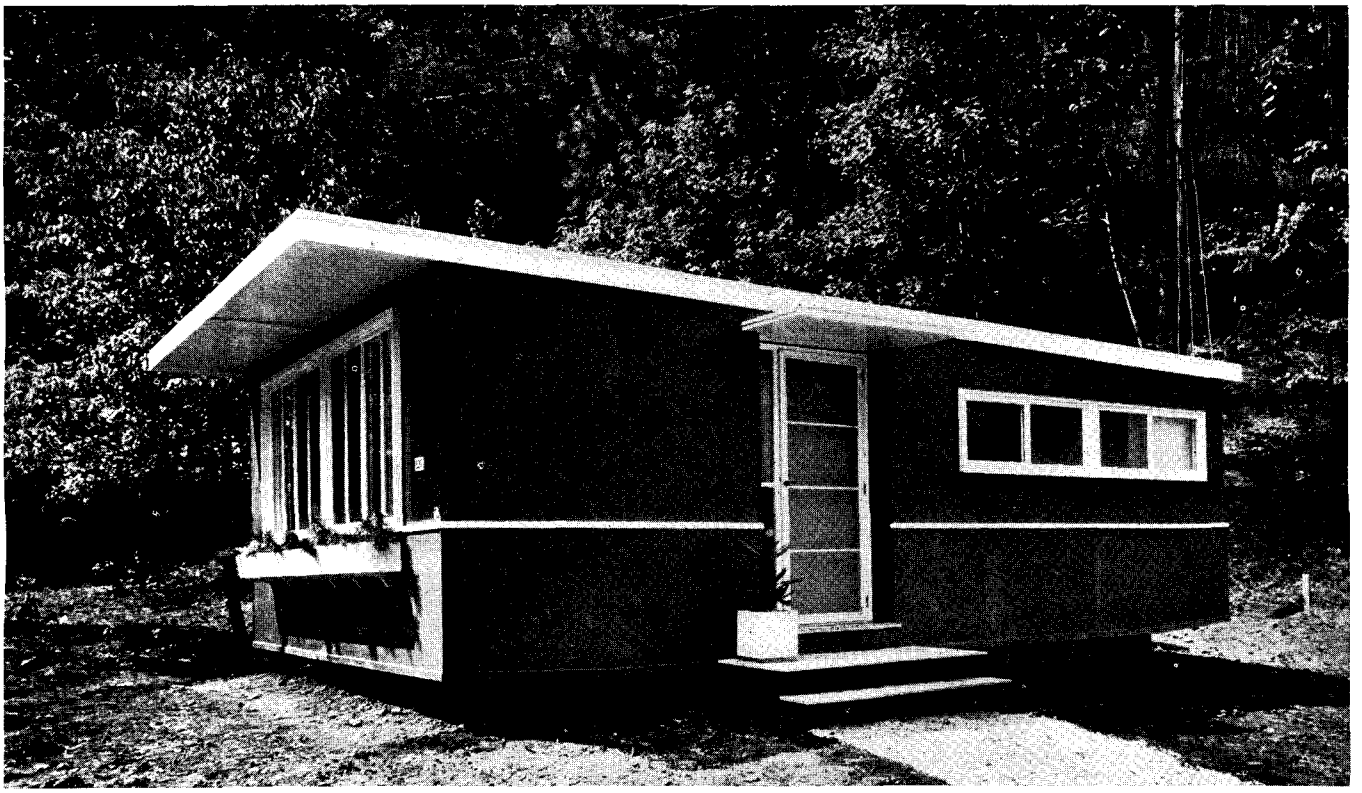
No, the major barrier is mental, fashioned of obsolete concepts. It is anyone's guess whether it will be surmounted by the time men and materials are again looking for employment. We may continue with fragmentary projects here and there, as before the war. Leadership may remain with countries where bombs shattered the prison walls of thought at the same time they cleared the ground



for rebuilding. The Old World may swap its place in the procession with the New.

Nor would it be the first time this happened. Town planning and housing have been pioneered by Great Britain, Sweden and the Netherlands; for volume of communities planned from the ground up, the U.S.S.R. exceeds all others put together. After the war, large areas of the world must be rebuilt; sheer magnitude and urgency of the task will force control by intensive planning. Perhaps the evolution of a new American attitude will await the time when achievements of reconstruction elsewhere begin to impinge upon us through travelers' accounts, rotogravure sections and the movies.

All hindrances in the way of planned communities can be traced back to a nostalgic search among the old forms and fictions for a security that somehow remains elusive. Therein lies the sanctity of land values and of legal and political devices. Some day, perhaps soon, we may find out that security can dwell henceforth only in dynamic, planned, unfettered expansion; we may also discover that in contemporary affairs, the individual's lone quest for economic advantage is as sterile as it can be catastrophic to society, and our boundless power to create great and good works can be unleashed only by collectively planned action.



In two of the four experimental types developed by TVA a slight shaping of undersides to accent the cantilever at ends, an eaves overhang front and rear and a slight projection of the roof along the side walls are reminiscent of traditional house design

THE TRAILER HOUSE

TVA's new approach to mobile shelter. By the staff of the Department of Regional Studies. Tennessee Valley Authority

IF FABRICATION means what it says, then progress of the packaged house toward its ultimate goal can be measured in an inverse ratio to the amount of unpacking that needs to be done after the article has been delivered to its site. In the development of its rather unusual system of prefabrication, the Tennessee Valley Authority made full use of this principle to meet the threefold problem: to build shelter for construction personnel which could be removed to subsequent projects with a minimum of fuss and waste; to do it quickly; and to avoid aggravation of the original housing shortage at remote project sites by additional crews engaged in shelter construction.

The answer was found in the sectional house—cut, like a loaf of bread, into parallel slices; each of which was transported to its site as a three-dimensional space unit, fully equipped. The slices can be coupled or uncoupled almost as quickly as railroad cars, and all they need for immediate functioning is a single connection for each of the site utilities.

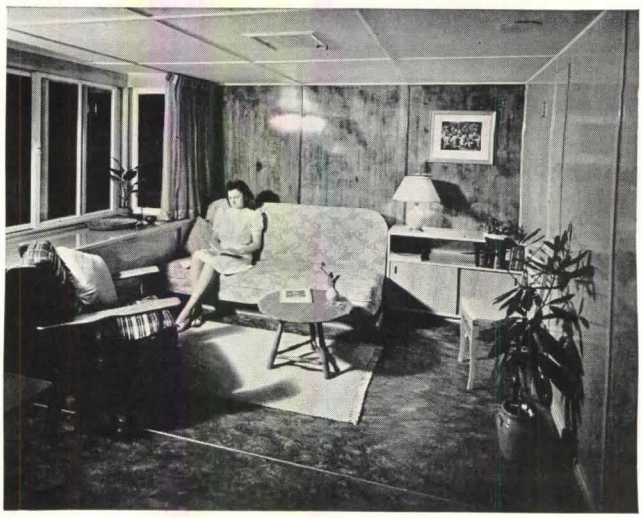
The method was first put into experimental use in 1939 on tourist cabins; then on several variations of war and construction workers' housing, some of which took a bow toward tradition by the use of sloping roofs, while others were more matter-of-fact. Dormitories, recreation and other accessory buildings were constructed the same way; and, lastly, with all that experience behind it, the Authority took the next rather radical step: from mere quantity production by traditional methods to an initial form of genuine industrial mass production.

As in other fields, mass production had to be premised on complete redesign of the product. The sections of earlier houses, while towed behind trucks in transit, bore a striking resemblance to trailers; and so it seemed natural to turn to the trailer industry for construction and transportation methods applicable to the new product. By the way, the naming of the product itself was difficult: it was not quite the same as a house, nor quite a trailer. Somewhat unimaginatively and lengthily, it is now called

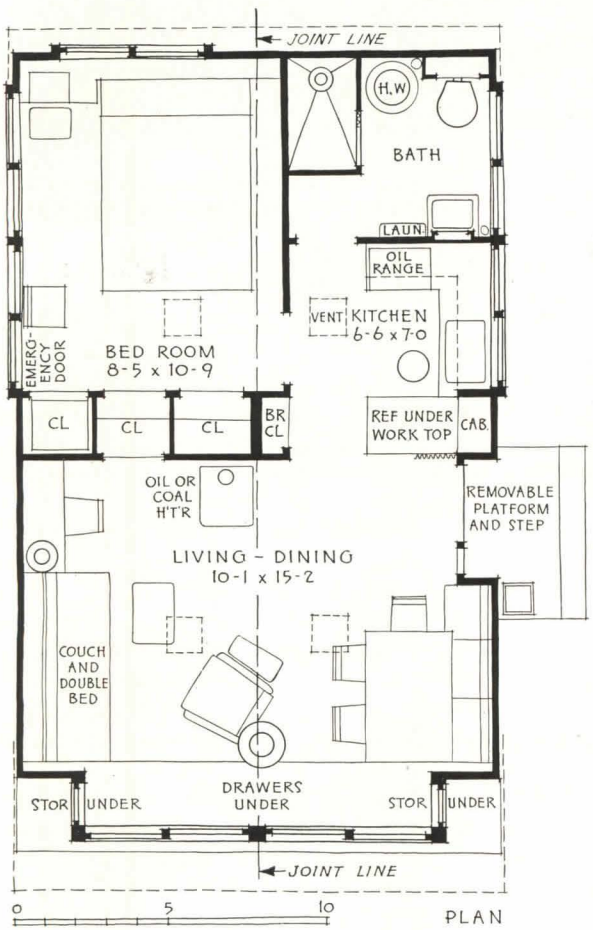
the trailer house; perhaps the future will endow it with a name of its own.

Precedents set by the trailer industry were applicable in more ways than one. Working with rigid space limitations since the beginning, manufacturers had developed compact equipment, thin walls, corresponding door and window types, methods to make low headroom acceptable by ceiling ventilators and so forth. Also, by necessity, they had learned to combine much greater rigidity than that of the conventional house with much less weight. Therefore the Authority set out to invite the collaboration of the trailer industry and met with greatly interested although somewhat skeptical response. Manufacturers supplied information on typical chassis, structural and equipment features. After some design experimentation the undercarriage was definitely separated from the structure itself, becoming merely a means of transport. A preliminary plan was submitted to a number of producers and their comments considered in the final design. Those who expressed interest at this stage were then asked to bid on four slightly different units to test the practicability of the idea and gauge the cost. Eventually, these four units were awarded in two contracts, one to Schult Trailers, Inc., and the other to the Covered Wagon Company.

As a further step in cooperation by the industry, the contracts were based upon expected quantity manufacturing cost rather than actual cost of the developmental units, and averaged in the vicinity of $2,000, f.o.b. plant. During actual construction, delayed because of preoccupation of the contractors with other war projects, representatives of the Authority worked closely with the construction crew, developing full-size drawings and answers

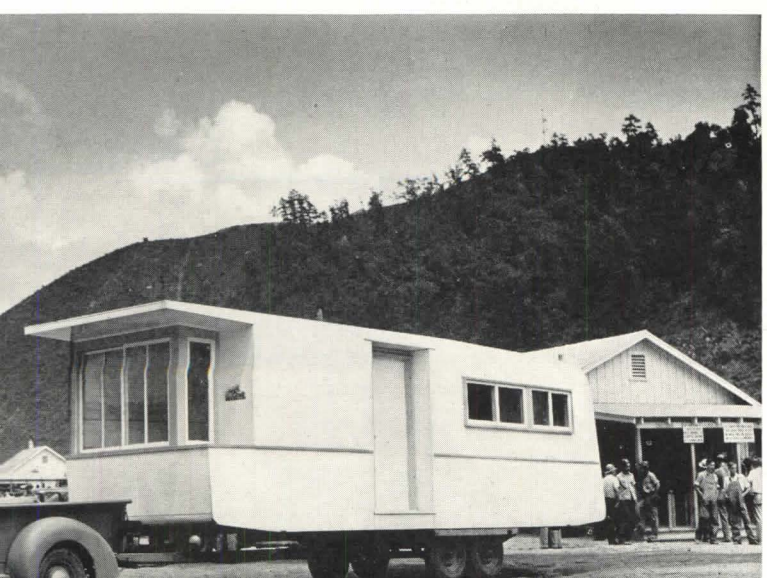


Interiors are surprisingly spacious. Wood surfaces generally are in fir plywood in natural finish, with wall over studio couch in mahogany-stained gum plywood. Ceilings are painted white



Delivery to the project was made with each half section carried on a light four-wheel undercarriage easily towed. Bay window at front end of house affords additional storage space beneath

Houses were assembled on site by a four-man crew. Each section was raised onto wooden rails and slid over from trailer to foundation girders. Boards in long direction are for appearance



Built-in furniture and dinette set are of white pine in natural finish; other furniture in maple, commercial finish close to natural. Plywood floor covered with marbleized linoleum in blue

An interior view looking through the living-dining room into the kitchen. The seat at the right, the kitchen stove, refrigerator and ceiling lights are among the numerous built-in items

to unexpected problems right in the plants.

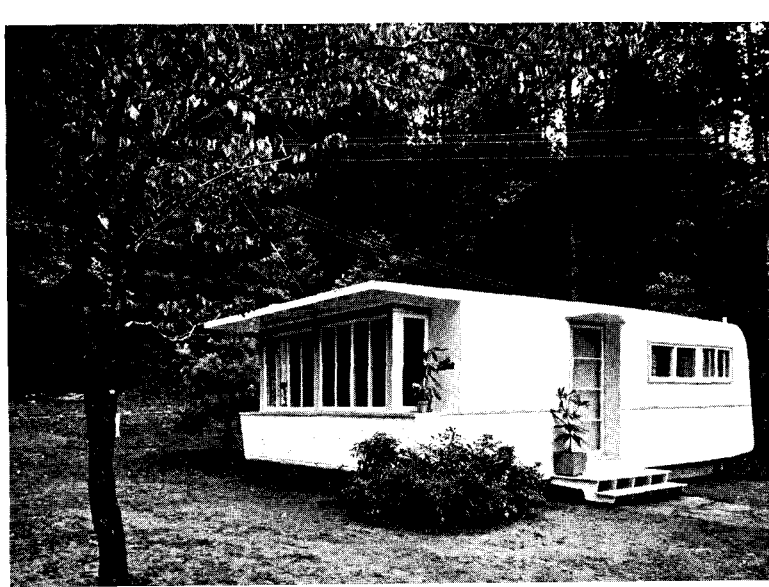
Of course, there was more involved than simple adaptation of trailer construction methods. Perhaps the most critical deviation was caused by the difference between trailers which are structurally complete units and house-slices which become complete only when assembled with their mates. The shell of the conventional trailer possesses great rigidity inherent in its shape and its all-around continuity. House sections had to be made structurally sound by other means without surrendering too much of the chief advantage of trailers which is their light weight. The successful solution of this problem was due largely to the efforts of the Authority's engineers, who applied the stressed-skin principle of plywood panel construction to the floor and roof of the structure. Among other advantages, this method reduced the thickness of the roof and floor by several inches—a very critical matter in view of limited highway clearances.

The structural shell thus obtained was more than adequately rigid and entirely weatherproof—except, of course, the matching sides of the slices which were closed up with tar paper and battens for transport. Nevertheless, following the traditions of the trailer industry, the exterior walls were further covered with composition board, chiefly because that material will readily take automotive lacquer; and lacquer finish was adopted, also on account of tradition, for the first four trailer houses which served as the experiment in this new phase of demountable construction. The composition board stood up well when applied by the plywood manufacturer, but seemed to show a slight tendency toward waviness when applied in the trailer plant. This would spell impermanence to the average spectator. The automotive finish, too, seemed to lose its significance when the trailer house was perceived as a new kind of animal with characteristics of its own. The current much enlarged project therefore exposes the plywood structure and makes the most of it by a natural varnish treatment.

Considerable thought was given to the design principles which governed exterior appearance of the four experimental models. This was thought important because public acceptance of a somewhat radical product, which runs counter to many deeply grained notions and concepts of

The second section was joined to the first by bolts and roof curbs along joint capped by prefabricated piece. Once water, sewer and electric connections were made, the house was ready

The completed house. Here the streamlined concept of mobile unit shows in lack of overhang along sides and rounded corners along bottom of front end and top and bottom of rear end



a home, may hinge to a large extent upon the first reaction to appearance; also, because in launching an innovation of potentially very wide implications, the architects of the Authority felt responsible for not adding another category of eyesores to an already abused countryside.

At one end, it seemed possible to invite public acceptance by maintaining the characteristics of traditional houses with only such deviations as were absolutely required for mobility. At the other extreme, the trailer house could have catered to accepted notions of streamlining. Because it was felt that development of a really indigenous form will probably follow only after the product has become stabilized and matter-of-fact, the four experimental units were compromises, somewhat like their hybrid designation as "trailer houses"; but two were shaded somewhat towards mobility by a degree of streamlining while the others stuck closer to the house concept with vertical walls and roof overhangs. Interestingly, professional as well as public opinion remained evenly divided, decided preference being recorded for one side about as often as for the other.

Windows and doors in thin panels were other items for which building construction did not furnish precedent. The trailer industry had its own standards. But windows on normal trailers are small and far between, because the product is designed, essentially, for short-term occupancy. Its present frequent use for extended residence is a product of war shortages rather than choice. The trailer houses, on the other hand, were conceived as homes, at least for certain conditions and for certain families. The floor area limitations of the two-slice unit (units can, of course, be designed for any number of slices) were quite severe and it seemed necessary to remove the depressing visual and spiritual effect of narrow quarters by a maximum of glass. Typical metal trailer windows were combined for this purpose in various groupings, none very satisfactory. Because at that stage of design the use of metal was proscribed, it became necessary, fortunately, to develop an alternative. Wood sliding windows solved the problem handsomely. The oversize windows of the living rooms, developed into full bays on two of the experimental types, have been especially effective in creating spaciousness and are particularly appreciated by tenants.

The practical effect of limited space was mitigated, to a large extent, by conscientiously tracking down every loose cubic inch and converting it into living or storage space; by thin walls and partitions; by great parsimony in door widths, circulation space, etc., throwing all the savings into the living room or bedroom where they make the biggest splash; and by extensive use of space-saving *built-in* equipment. These efforts are rewarded by flattering remarks of tenants on the livability of what space there is, on the ease of housekeeping, and by the absence of objections to the regimentation of domestic habits and personal preferences which goes with design of each element of space and structure for a specific function.

Another important reason for tenant approval was the relative completeness of furniture and furnishings. In further extension of the experiment, one of the four houses was completely equipped at the additional cost of $150—although a thrifty housewife could probably do so for a little less. To the planners of the Authority complete furnishings seem to be integral to the trailer house idea: the unit itself being mobile, its furnishings hardly need additional mobility of their own. From the timely angle of overburdened transportation, also, it seemed worth while to eliminate long hauls of construction workers' bulkier household goods. For the tenants themselves, weary of buying equipment each time their employment required moving to new places only to find that their curtains and furniture cost too much to ship or did not fit when the next move came, semi-complete equipment was a godsend.

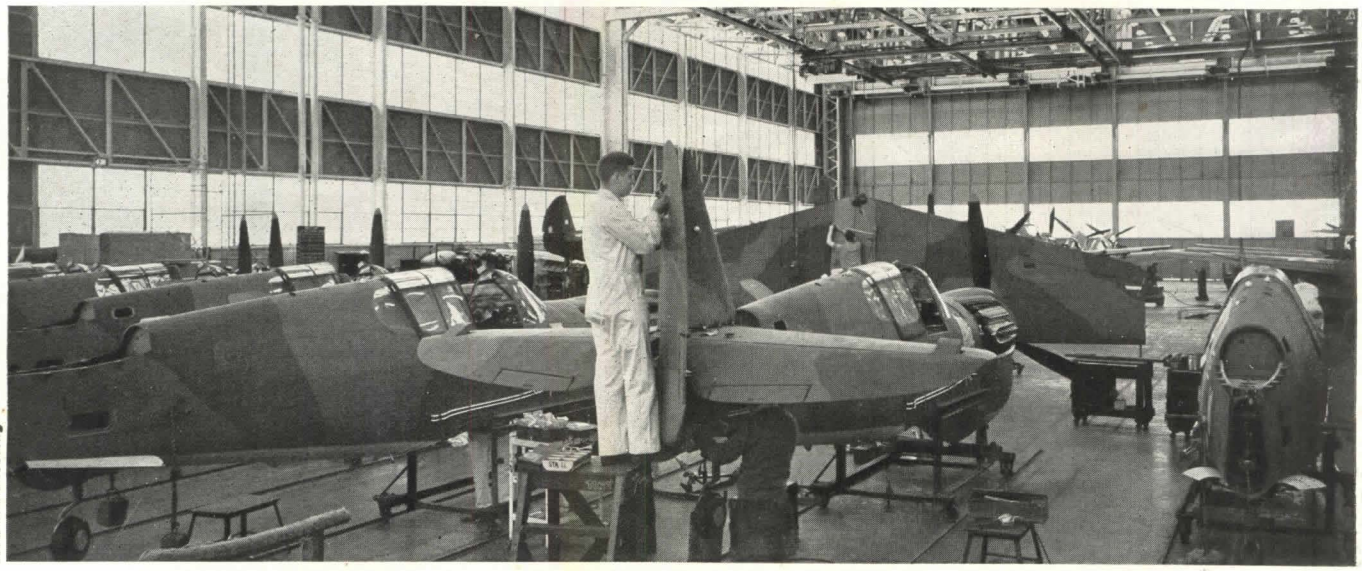
During the three months the four experimental units have been in use, tenant reactions were carefully watched. But, as is sometimes the case with "naturals," immediate and favorable acceptance was so obvious that continued inquiry was useful for documentation rather than as proof of a fact that was apparent from the minute one of the manufacturers parked the first completed units outside the plant and produced a minor riot.

After being towed an average of 650 miles, behind light three-quarter ton trucks, the units came to rest on foundations prepared at the Fontana Dam of TVA, a war construction project in the high mountains of North Carolina. Because of the extreme local shortage of shelter and the difficulty of commuting over tortuous mountain roads, conditions at the site were perhaps exceedingly favorable. Nevertheless, the extreme eagerness with which potential tenants beseiged the renting office appears to assure acceptance in more competitive locations too. Despite a considerably higher rental scale per square foot, tenants showed decided preference over built-on-site or earlier demountable houses.

The reasons for this preference were compounded of several factors. Trim, sleek appearance obviously had a lot to do with it, as well as livability and completeness of furnishings. At any rate, the Authority felt sufficiently impressed with the experiment to believe that trailer houses offered the solution to the immediate housing problem at Fontana and awarded a contract to Schult Trailers for one hundred units. Through omission of the bay window and some other economies, but chiefly by closer estimates based on past experience, the cost came down to $1,800 per unit, f.o.b. plant, in itself a fact of some significance.

The conclusion seems warranted that if any commercial producers eventually offered a similar product, they may expect to tap a large, brand-new market. The implications of this fact upon real estate, city planning and habits of living may be interesting, even revolutionary. But that is a tale for the future to tell.

MECHANICAL EQUIPMENT FOR FACTORIES



Hedrich-Blessing

As Reported By Technical Specialists of Albert Kahn Associated Architects & Engineers, Inc.

HEATING AND VENTILATING . . . . . **By G. S. WHITTAKER, Associate**
ATMOSPHERIC CONTROL . . . . . **By H. E. ZIEL, Associate**
BOILER PLANTS . . . . . **By F. K. BOOMHOWER, Associate**
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KITCHENS AND CAFETERIAS . . . . . **By H. E. SLOMAN, Associate**
MEDICAL DEPARTMENTS . . . . . **By F. A. FAIRBROTHER, Associate**

PLANTS TO MAKE the precision instruments of modern warfare must, in themselves, be machines. Their mechanical equipment is often about as complex as the implements they produce. And just as necessary to final victory.

Nevertheless, all-out war demands that designers do everything possible to save material, to save power and oil, to save time. And these pressures have brought significant changes in the equipping of war factories, just as they have in the construction of the plants (see ARCHITECTURAL RECORD, Dec. '42).

Noticeable trends affecting mechanical design, as will be seen from the following articles by equipment specialists of the Kahn organization, are: to scatter plants in rural locations, give them blackout protection, provide for an increasing number of women workers, and convert to coal for fuel.

HEATING AND VENTILATING

By C. S. Whittaker, Associate
ALBERT KAHN Associated
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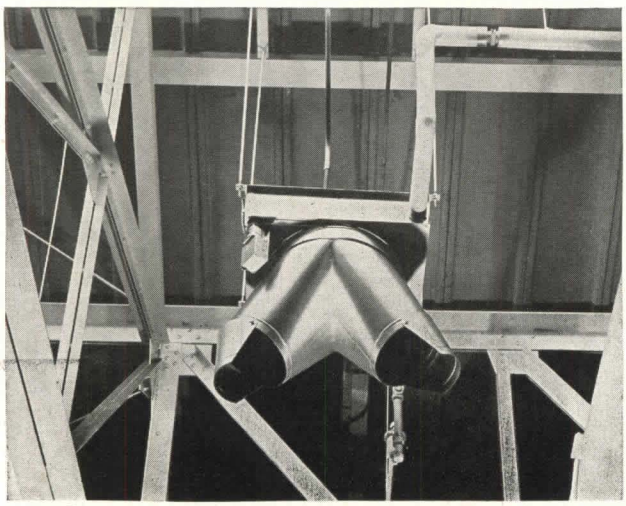
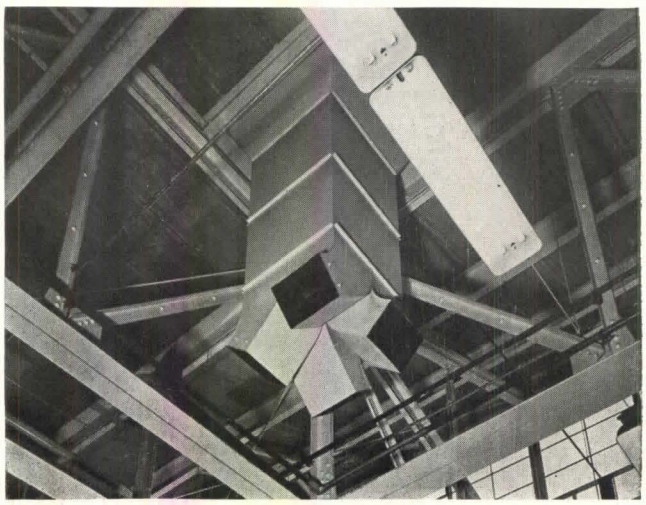


A unit heater with the revolving type outlet. A small motor at the side of the unit revolves the outlet at a rate of about once every two minutes, spreading heat and preventing a steady blast



Hedrich-Blessing

A summer fresh air supply unit installed in a large airplane plant. This type of unit is stationary, and serves for ventilation only. Winter heating is provided by unit heaters (left)

INDUSTRIAL BUILDINGS now being erected in connection with the enormous war production program are radically different from factories built in the period immediately preceding the war. Daylight buildings have, in many cases, given way to midnight buildings.

Problems in heating and ventilating which have arisen have been due chiefly to the increased size of the buildings, and to the need of conserving critical materials. In the ordinary course of events, a change of program would have resulted in the development of new methods and processes to meet new requirements. There has not been time for this. In order to place plants in operation in the shortest possible space of time, we have been obliged to stick to standard methods and practices. Manufacturers of all types of equipment have suddenly been called upon to multiply their output, while at the same time their sources of raw materials have been placed under greater Government restrictions.

The design of heating and ventilating systems for our factories varies with the requirements of individual plants, and with the climate of the locality.

OVERHEAD UNIT VENTILATORS

We recently completed a plant in an isolated location, remote from the danger of enemy bombing. The building had no side wall sash nor monitors, and it was necessary to devise a unit system which would properly ventilate the enormous volume of enclosed space with the minimum use of critical materials. We had to save metal both in the ventilating equipment itself, and in the structures required to support it.

In uniformly-spaced openings in the roof we installed supply and exhaust fans, designed to handle large quantities of air. The ventilators were designed for blackout purposes. Discharge ducts extended as low as plant operation clearance height would permit. All units were equipped with dampers which were open when the fans were running, tightly closed when they were not. The supply fans were equipped with diffuser outlets. Air was delivered at velocity sufficient to enable it to reach the floor. The system—allowing for heat gain, sun effect, men, motors, operations, and lights—was designed to maintain a summer temperature in the plant not more than 10° higher than the temperature outside.

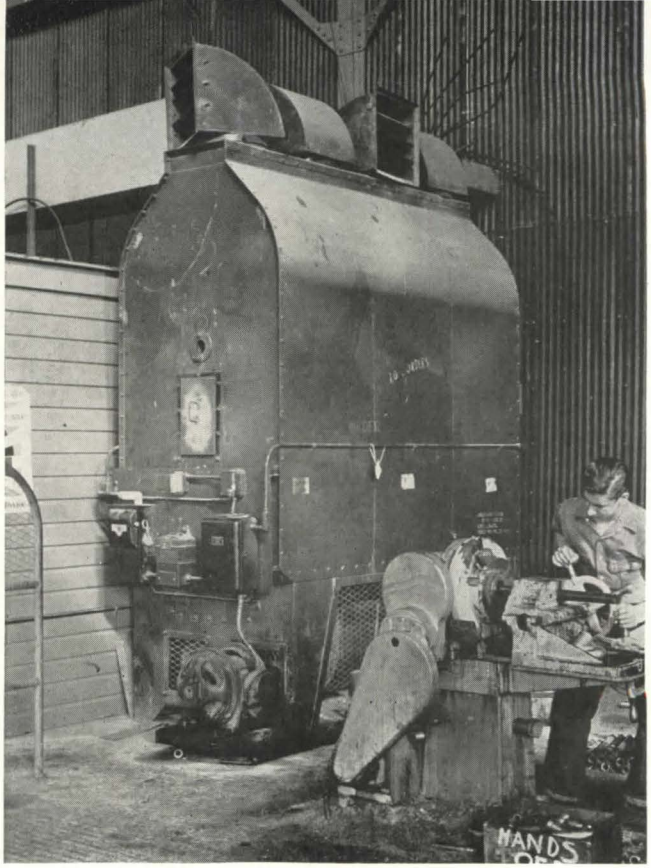
In actual operation, fans were run all night long. The resultant cooling effect was so great that the temperature was lower than the outside air until late in the afternoon. In winter, these supply and exhaust fans will not be operated. A modified supply unit, with steam coils and face and by-pass dampers, designed to go in the same-sized opening, will introduce enough tempered air to compensate for air exhausted in the manufacturing operation.

OVERHEAD UNIT HEATERS

Overhead unit heaters are most economical for plants of large area, because of the ease with which steam and return pipes can be installed in the truss space. We have found vertical-shaft heaters, which permit uniform distribution of air, while allowing deflection of air from an area where it might be objectionable, most satisfactory. Unit heaters now deliver air from mounting heights which used to be considered prohibitive. The new models have been stripped of metal wherever possible. An overhead system places condensate return lines high up, and eliminates the possibility that the return may dip below allowable clearance height.

In order to reduce pipe sizes, we are supplying unit heaters with high pressure steam.

Another type of overhead unit heater used in the same plant. Unit heaters have the advantage that both steam and condensate return lines can be installed overhead through the trusses



Direct-fired heaters are sometimes used when the restrictions on the use of metal are too rigid even to permit installation of unit heaters. This is one of the self-contained, packaged units

Standardizing the size of roof openings, as well as the types of ventilators, fans, and dampers, has enabled us to lower the initial price of the equipment and to cut down the cost of each succeeding operation.

DIRECT-FIRED AIR HEATERS

Direct-fired heaters are sometimes used when the restrictions on the use of metal are too rigid even to permit installation of unit heaters. Some of them are self-contained packaged units comprising steel-welded combustion chambers, air chambers, and fans for the circulation of the air and for exhausting the smoke from the fire.

Another type is essentially the same, except that combustion and air circulation take place in a furnace built of brick. These systems have few moving parts, no pipe lines for water or steam, and installations require less metal for a given quantity of heat than any other system. Our recent work provides two examples.

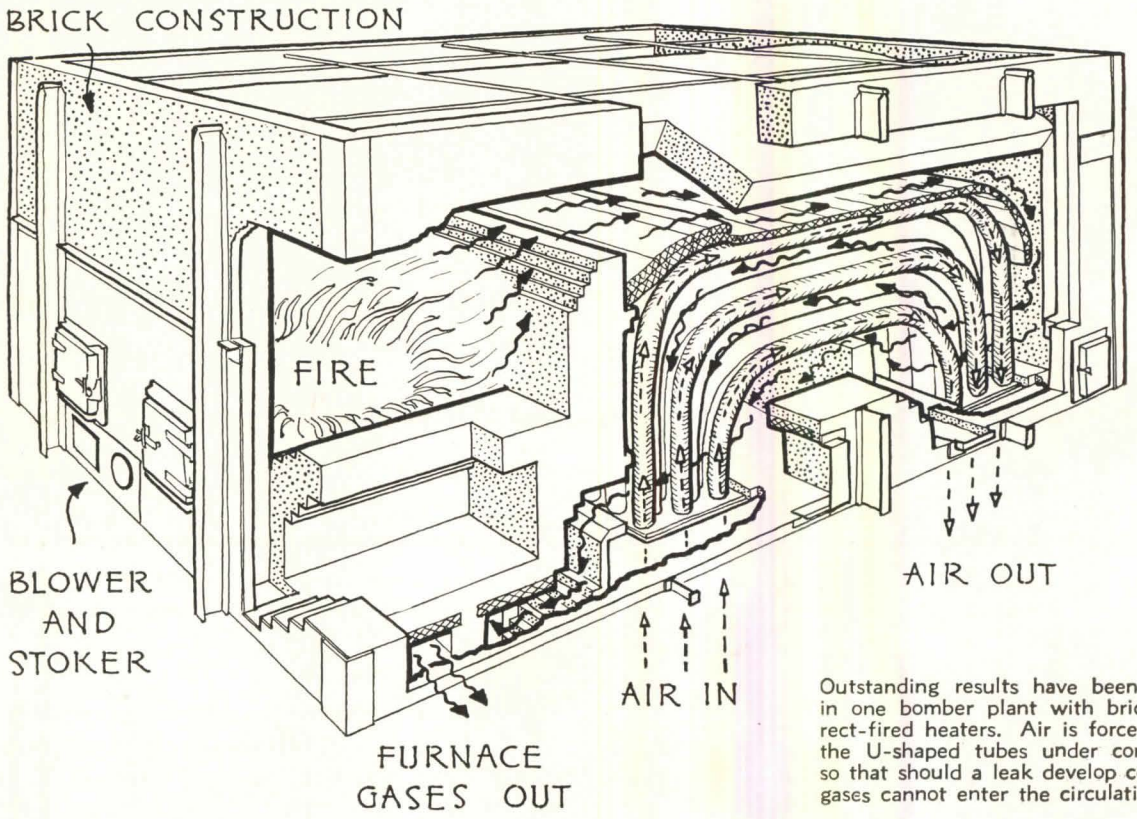
The requirements of one plant have been met by installation of many individual direct-fired heaters. Each one serves the immediate area in which it is located. The heaters are placed below floor level and air is delivered underground through masonry and vitrified ducts. Since there is no steam supply, a separate plant of limited capacity has been installed to provide necessary process steam and to heat offices, laboratories and other small divided areas.

The conversion of this type of heating from oil or gas to coal presents numerous difficulties. It entails maintenance of coal fires in a large number of scattered locations and the handling of ashes is difficult.

In another plant, a building 1,000 ft. long and 400 ft. wide, with high steel sash and monitors 66 ft. above the floor, direct oil fired heaters have also given outstanding results. In this case, air is delivered at the floor line and at intervals along the outside walls, in large volume, at a temperature only slightly above desired room temperature. The air is heated in nine separate distributing stations, each handling 85,000 c.f.m. and having a normal heat delivery of 7,250,000 B.t.u. plus an overload capacity of 25 per cent for short or warm-up periods.

Each station consists of a tubular air heater enclosed in a heavy fire brick setting. Banks of steel tubes, through which air circulation is maintained, are bent in the shape of a "U." This shape has been adopted to allow for expansion and contraction of the pipes and also to increase the turbulence of the air which passes through them. The tubes are separated from the combustion chamber by a layer of fire clay baffle tile. Hot gases, which originate in the combustion chamber, pass over a bridge wall, travel the full length of the heater, return through the chamber in which the tubes are enclosed, and exhaust through an induced draft fan. The air to be heated first passes over the outside of the heater to be preheated, then enters the bent tubes, is forced through them by a fan, and delivered to a distributing system of ducts. Large grilles in the center of the factory floor return the air to the heater through tunnels, which also contain the process piping.

The necessity of changing this plant from liquid to solid fuel introduces many problems which could have been avoided if the original design had anticipated the use of coal. The heaters are in the central part of the building and coal must be wheeled long distances, which will require employment of a large number of men. The plant, which was almost self-operating, will *now require constant* attendance by a large number of people. The factory was notably clean and is now threatened with a deposit of fine coal and ash dust.



Outstanding results have been achieved in one bomber plant with brick-set direct-fired heaters. Air is forced through the U-shaped tubes under compression, so that should a leak develop combustion gases cannot enter the circulating system

BLAST SYSTEMS

Neither unit heaters nor direct-fired air heaters are satisfactory in places where manufacturing operations have to be conducted at uniform temperatures. In such places we install blast systems. Large fan units are placed in fan rooms above the roof. Air delivery is through non-metallic ducts, run either above the roof or through the truss space to all parts of the building. Filters and coils are located in the fan rooms, and in several very large buildings we have recently supplied the coils with water which is heated in winter and chilled in summer.

Refrigerating equipment of centrifugal type, used to cool the water, has been driven by steam turbines. Cooling towers have been installed to provide condensing water for the condensers on the turbines and on the refrigerating machines. Steam turbines also drive circulating pumps.

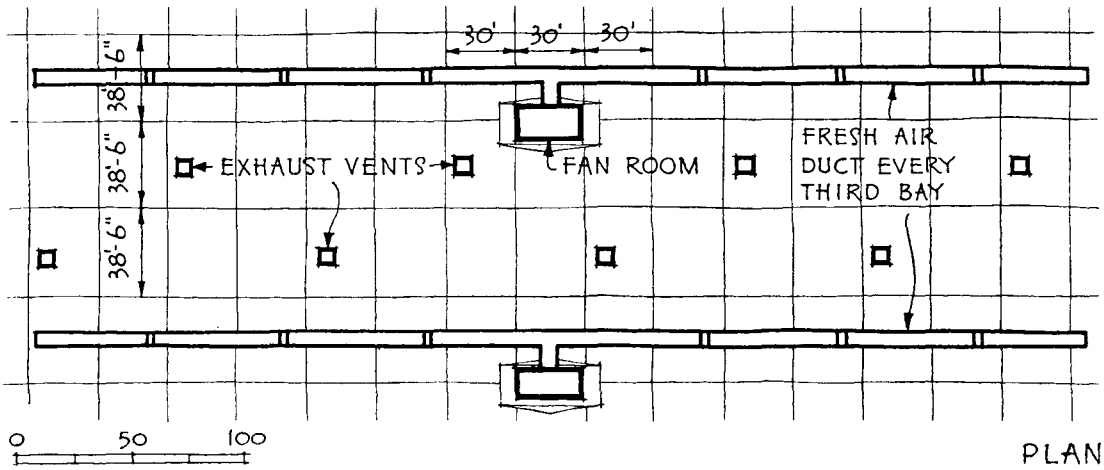
DUCTS

Ventilating ducts today bear no resemblance to those of a few months ago. Sheet metal workers now erect ducts consisting of smooth sheets of asbestos cement, plywood, pressed wood, or other similar material. The only metal permissible is for corners, angles and junctions at the ends of the boards. Many ducts are installed without any metal whatsoever, wood being used for corners and for fastening. Surprisingly enough these ducts, when properly planned and fabricated in a workmanlike manner, present an appearance which is better than that of sheet metal.

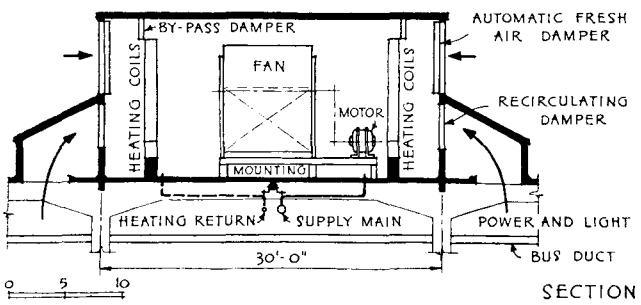
COMBINATIONS

Some of our plants require a combination of several types of heating. A hot blast system, for example, may be used in the main assembly building and a combination of hot blast and radiators in the engineering section. The main building of one of our plants was so vast that 65 fan rooms were required. Each fan had two-speed motors, the low speed for use in winter when the system supplied approximately two complete air changes per hour for the total height of the building. In summer the high speed was used and supplemental roof ventilator fans were run so that we obtained four air changes per hour for the entire height of the building, ten changes at the height of 12 ft. Warm air is distributed through ducts in the truss space, temperature is controlled by thermostats. In this building, mezzanines are heated by radiators and ventilated from the central system. In the offices, laboratories, hospital wards, and operating rooms, there are wall-hung convectors. In the toilets, locker rooms and stair halls, there are wall-hung cast-iron radiators.

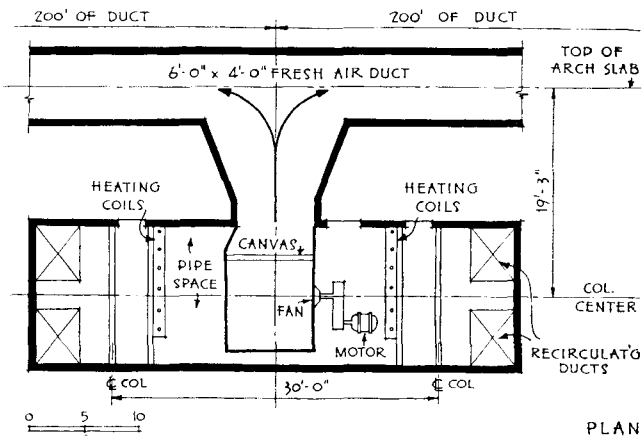
In many plants, cafeterias, toilet and locker rooms and electrical piping and wiring are now located in the basement, and these basement areas must be ventilated. Fans connected to vent shafts lead to exhaust and intake chambers above roof levels. Cafeterias, offices and other similar parts of the plant were air conditioned until recently, but such luxury is now out for the duration. Under present conditions, we sometimes are not even permitted to mechanically ventilate offices, let alone air condition them.



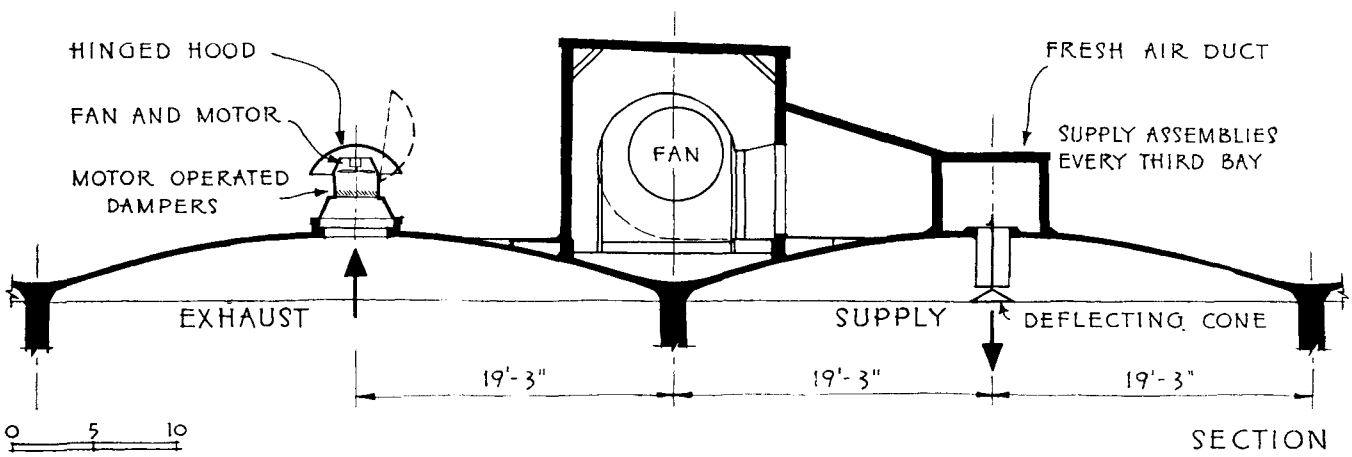
In the newer aircraft plants it is no longer permissible to air-condition general factory areas, but it is still necessary to provide adequate heat and ventilation. Drawings on this page illustrate the system now being installed in a huge plant. This small section of the roof plan shows fan rooms built on column centers and fresh air supply ducts that run along on the roof



A section of the fan room showing how fresh and recirculated air is mixed, carried through heater coils to the fan and delivered to supply ducts. Supply and return lines serve several units



An enlarged plan of the fan and heater room. Four holes in the roof slab provide the recirculation from the factory area below. Each fan and heater unit serves fifteen fresh air supply outlets

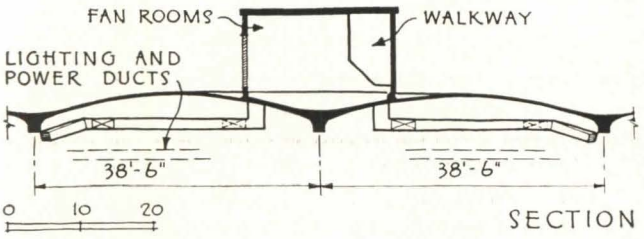


Sectional view of exhaust unit, left above. Exhaust units are motor-operated for positive action. The hood is mounted on hinges so that it can be raised when servicing is necessary

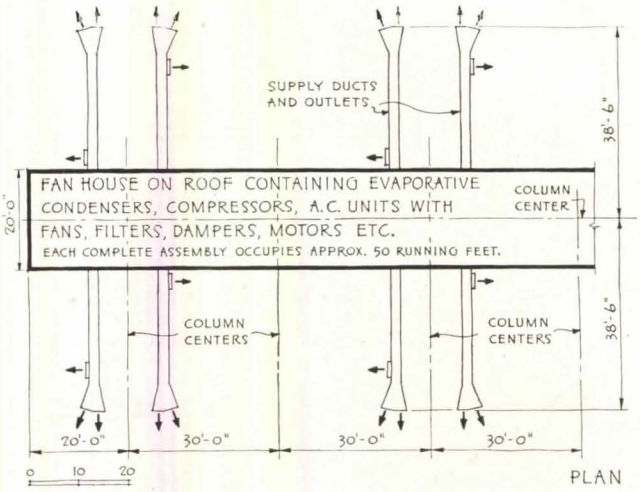
The fan room and duct assembly are of wood construction, to save metal, and covered with corrugated asbestos siding. Supply ducts run in every third bay, exhaust vents in others

ATMOSPHERIC CONTROL

By H. E. Ziel, Associate, ALBERT KAHN Associated Architects and Engineers, Inc.



In the same building (p. 57) precision assembly areas are fully air-conditioned. All air conditioning equipment is located in long fan rooms



Diagrammatic plan of a segment of the long air conditioning equipment rooms, showing how ducts fan out (under the roof) to distribute air

DURING the *defense plant* period of the current program of industrial construction, it was customary to provide temperature control for administration buildings, engineering offices, and some other departments, as well as for large manufacturing and assembling areas. The shortage of materials and equipment which has developed since we entered the *war plant* period has made it necessary to prohibit all "luxury ventilation."

Many areas, nevertheless, some of which are very large, are still being equipped with temperature control because of the character of manufacturing and assembly operations carried on in them or because of the climate of the locality in which they are built. Often certain parts of large plants are air conditioned for certain specific reasons. About one-fourth of the manufacturing and assembly building of an immense aircraft engine plant now being constructed, for example, is air conditioned, but no such provision is made for offices or other non-critical areas. The conditioned area, however, being 1,520 ft. by 450 ft. in size, is in itself much larger than the average factory.

The roof of this plant is a succession of arched concrete slabs. On top of the roof, in the valleys between adjacent slabs, nine long penthouses, of wood frame construction covered with corrugated asbestos siding, have been built. The penthouses contain 81 compressors and an equal number of fan units. Each of the fan units has a capacity of 21,000 c.f.m., and each of the refrigerating units has a rated capacity of 60 tons of refrigerating effect per day. Air is taken in through louvers in the walls of the fan rooms. When conditioned, it enters the assembly room directly below. Separate roof vents take care of the exhaust.

The decision to control or not to control temperature depends, to a large degree, on the climate of the region in which a plant is to be located. In close precision work the expansion of metals on a hot day may produce much scrap if the area is not cooled. If a plant is located in New England where there are only a few hot days in summer, we might make no provision for control. A department could close down on those few hot days. If Missouri or Kansas, on the other hand, were the location, it would probably be best to cool areas in which essential work was to take place, so as to insure continued operation through the hot summer weather. Plants which are otherwise almost identical, may have entirely different heating and cooling systems.

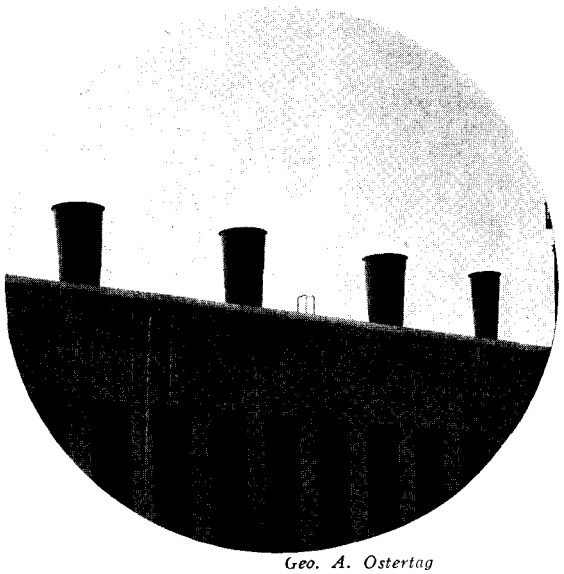
The control of humidity is becoming a matter of the utmost importance. Preparations are now being made to build cargo planes of plywood. Such planes will be composed of thousands of parts, some of which will be plywood, some solid blocks—the two held together by glue. The parts must fit together exactly to form the plane. There must be a minimum of 6 per cent and a maximum of 12 per cent of equilibrium moisture in the wood. Here again the location of the plant may determine the type of equipment necessary. A plant is now being constructed in a southern city which will have no artificial heat at all, but it will have considerable dehumidifying equipment. The air will be treated either by refrigeration or by chemicals, with the use of lithium chloride. There is some inclination to favor the chemical method as it requires neither refrigeration equipment, which is scarce, nor coils, which are made of critical materials. Fans will be required for either system. Cement-asbestos board will be used for duct work.

Special provisions for temperature and humidity control must always be made for certain parts of airplane plants. Gauge rooms are always temperature controlled. Dope rooms must be kept at certain temperatures and humidities the year round, so that proper tautness in the fabric of wings may be maintained. Tunnels and transformer rooms, when located under work areas, have to be provided with exhaust fans to keep them at proper temperature, and to prevent them from heating the room above.

The ventilation of test cells is of great importance. Air must be moved through the cells to remove toxic gases and products of combustion. Air movement, to cool the motor, must simulate conditions which will exist when the motor is in flight. To obtain these conditions we exhaust air at both floor and ceiling, and we turn the air supply directly against the engine, producing air turbulence sufficient to keep the oil temperature in the engine below 375°. A definite supply of conditioned air is also fed to the carburetor, and maintained within exact limits of temperature and volume.

BOILER PLANTS

By F. K. Boomhower, Associate, ALBERT KAHN Associated Architects and Engineers, Inc.



Geo. A. Ostertag

Tall smokestacks are not necessary where induced draft fans force gases out at high velocity

NEARLY ALL the changes that have taken place in boiler house design and equipment during the past year have been due to the need for blackout protection, or the necessity of saving critical materials, or restrictions on the use of fuel oil.

All boiler houses are now required to be windowless. We provide, however, for future installation of windows if they are later desired. Restrictions on materials have obliged us to make track hoppers of concrete instead of steel. Concrete has also replaced steel for the frames of the buildings themselves. Walks and stairs around the boilers are now built either of concrete or of wood.

The unexpected shortage of fuel oil has meant that many plants which were designed for oil-burning are now being asked to convert to coal. In many cases this is quite a problem, entailing considerable expense.

When boiler houses are designed for oil burning, there is no necessity of a basement under the boilers. Small boilers may be converted to coal by the addition of side-dump stokers and ashes may be removed at the level of the firing floor, but when boilers of 50,000 lb. per hr. capacity or larger have to be changed over, space below the firing floor has to be provided for ash hoppers and handling equipment.

In cases where the emission of fly ash or cinders from the stacks might be objectionable, ash and dust removal equipment has to be installed in the uptakes. In many war plants, particularly those which produce airplane engines, dust is very objectionable because it interferes with production. Changes in the induced draft equipment are also necessary, because of higher resistance to the flow of gases. The forced draft fans have to be changed also because a greater amount of air is required. If, for example, a fan with a static pressure rating of two inches is being used in an oil-burning installation, it may have to be replaced, when a change to coal is made, by a fan having a rating of four and one-half inches.

Changes from coal to oil involve the procurement and installation of coal and ash handling equipment. This includes not only stokers and conveyors for both coal and ashes but also coal and ash storage equipment. Stock piles require space. Frequently other buildings have been erected around the boiler houses, and there is no convenient storage space available. It then becomes necessary to locate the stock pile at considerable distance from the boiler house and to provide a track and cars for hauling the coal and also equipment for reclaiming it at the pile. A concrete example will serve to illustrate the extent of the work sometimes involved.

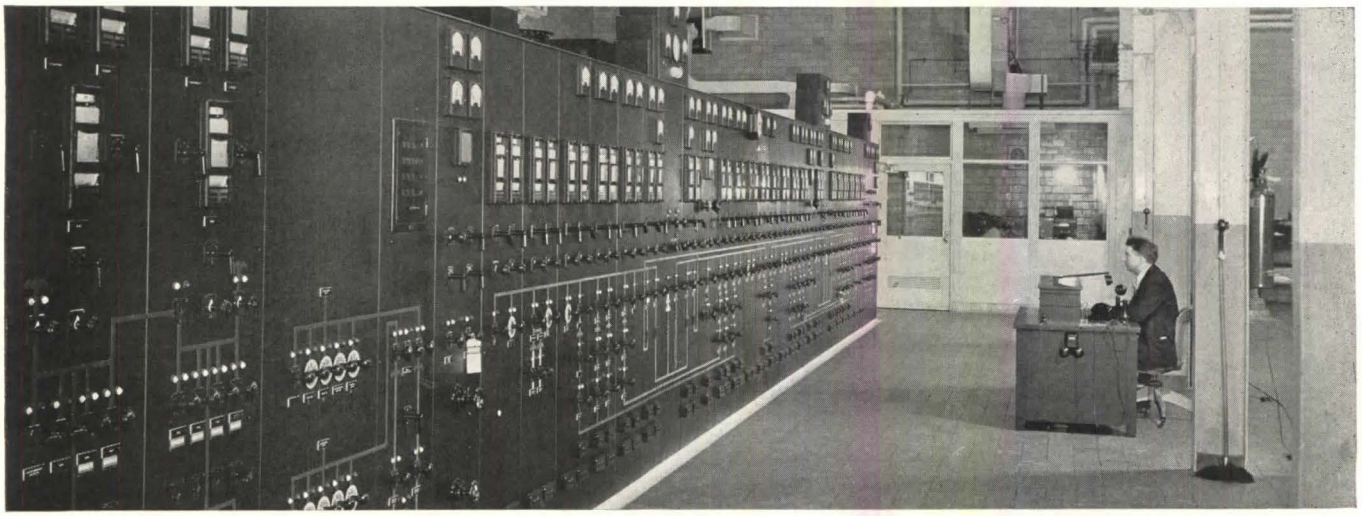
One large plant recently completed is now faced with the necessity of changing from oil to coal. Notwithstanding the fact that it was designed and built for a possible change of this very kind, provision having been made for the installation of a steel bunker, vacuum ash-handling system, spreader-type stokers and fly ash and dust collectors, the cost of making the change is estimated at more than $250,000. The cost of making the anticipated changes, and of changing the induced and forced draft fans is estimated as follows:

Steel bunker	$ 25,000
Coal handling system	35,000
Ash handling system	23,000
Four stokers with forced draft fans	88,750
Four induced draft fans	7,500
Four fly ash and cinder collectors	28,000
Piping and covering	12,000
Electrical work	15,000
Structural and concrete work	8,000
Ash hoppers and duct work	8,500
Total	$250,750

The concrete work necessary for a steel track hopper has already been installed, but a concrete hopper will probably have to be used. Due to the fact that no space is available near the power house for stocking coal, provision for this will also have to be made. It is recommended that coal stocking space be found elsewhere, and that arrangements be made to store the coal with a caterpillar tractor and 12-yard wheeled scraper. By this method the coal will be compacted and the danger of spontaneous combustion eliminated. A track hopper, feeder conveyor, and elevator will take coal from the car and spout it out on to the scraper. The same scraper will reclaim the coal from the stock pile, the same elevator and hopper will carry it into a car, and the car will transport it to the powerhouse. This equipment will cost about $25,000, and, if adopted, will bring the estimated cost of the change from oil to coal to $275,750.

ELECTRICAL DISTRIBUTION

By V. C. Wagner, Electrical Engineer, ALBERT KAHN Associated Architects and Engineers, Inc.



In the all-out search for metal savings, some of the newer electric panelboards are of composition or wood instead of the usual metal

IN THE FIELD of electrical installations, the past year has seen many new developments and modifications of accepted practices. Most of them have been due to restrictions on the use of critical materials. Many of the changes are improvements and it seems likely that some of them will be retained after the current emergency has passed.

During the early part of the defense period, it was considered desirable and advisable to install duplicate service and distribution systems. The practice used much material and it has been discontinued. Straight radial distribution, in place of complicated network systems, is now favored. The new systems are less flexible and do not provide the same assurance of continuity of service of the elaborate systems of the past.

High voltage is being used for distribution wherever possible, to save copper and lead. Utilization voltages higher than those formerly used are also favored for the same reason. For lighting distribution, the three-phase, four-wire system operating at 120-208 volts is widely used. Such a distribution system requires less material than the single-phase, three-wire system. In plants where the power load is approximately the same as the lighting load, and where no large machines are used, the same distribution system may be used for light and power, utilizing standard 220 volt motors and other power equipment.

Another recently developed system for lighting distribution favored at the present time is the 440-volt, three-phase, four-wire grounded neutral system. It is used in connection with special fluorescent lamp equipment. Because of the high voltage and a special circuit, it saves critical materials.

Load center substations with transformers protected by circuit breakers or disconnects on the primary side, and connected directly to the adjacent secondary switchboard, are also being utilized. From the secondary switchboard, on which are located suitable circuit breakers and fuses, distribution is made to light and power panels. Installation of these substations in factory areas without the use of fireproof vaults has been made possible by the development of transformers which are cooled by non-inflammable liquids rather than by oil. In some plants, for both light and power, we are using open-type switchboards with housings made of composition material or merely protected by screens.

Open feeders supported on insulators are used instead of running the feeders in conduits. This plan not only requires no conduit material, but there is also a further saving of materials made possible by the fact that wire exposed in air is permitted to carry a higher current. A disadvantage is the fact that for a given size of wire, the voltage drop is somewhat greater than for wire in conduit. For branch circuit wiring, non-metallic sheath cable such as Romex or Braidex is used wherever possible, and we are even using knob and tube wiring.

In fluorescent type lighting installations, Bureau of Standard reflectors made of non-metallic material are being mounted in continuous rows. The channel, which is part of the fixture, is utilized for the circuit wiring, eliminating a separate conduit. Very recently, a non-metallic channel has come on the market, reducing still further the use of steel.

In some sections of certain plants, the lighting units are on alternate circuits, or every third unit may be connected to the switching circuit. In one installation the lighting intensity can be made one third, one half, or full strength by merely flipping a switch, which turns on every third unit, every second unit, or all units in the row.

Increasing the size of the electrical systems to serve plants of a magnitude heretofore unknown has in itself been one of our greatest problems. Brief descriptions of two plants may serve to illustrate the developments which are mentioned above.

In the first plant, which was built sometime ago, power is brought in by duplicate, widely-separated, 120 kilovolt utility lines. It is distributed underground, at 13,800 volts,

to a series of underground plant substations. Power may be supplied in case of an outage to any bus section from either utility service, all bus sections being inter-connected by means of an emergency tie. In addition, 2,500 kw turbo generators on two of the bus sections can be synchronized with the utility lines or paralleled with either. All substation transformers for both power and lighting are inter-connected on the secondary sides.

The substations feed a veritable network of lines to hundreds of column cubicles located throughout the manufacturing areas. There are no overhead conduit or bus systems in this plant. The underground system is so designed that, in case of damage, only a relatively small area would be cut off, and very likely new connections for this area could be made in short order.

Lighting is of fluorescent type, operated by underground feeders. In the general assembly area, lighting units are mounted end to end in continuous rows on 10-ft. centers, at a height of 36 ft. The maintained intensity on the working plane is approximately 30 foot-candles.

In a second plant, now being built, power from the local public service company is brought in at 33,000 volts to two main 15,000 kva transformer stations. All secondary distribution at 12,000 volts and light circuits are at 440 volts. Public utility power in this case is augmented by the feed-back from many engine test cells.

Vault transformers are located below floor level and other transformers are in the manufacturing rooms, circuits radiating out from the transformers to the main bus systems through fiber ducts. The bus systems are carried on columns 17 ft. above floor lever.

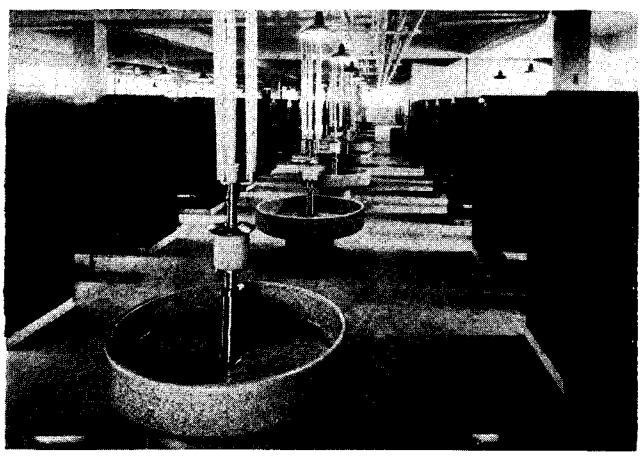
Lighting is by combination mercury and Mazda units hung flush with the bottom of the roof ribs. Each unit comprises one 400-watt mercury tube and three 100-watt Mazda lamps. The units are staggered—two in one bay and one in each alternate bay. Each serves a floor area of 400 sq. ft. Such units are considered the most economical in the use of critical material per unit of output. Current consumption is also low, being only 2.3 watts per sq. ft. of lighted floor area.

Electrically operated portable tools of many kinds are used in industrial plants. We provide numerous outlets at locations most convenient to the workers, where the tools may be plugged in. This results in eliminating long cords lying on the floor for someone to trip over. Where tools are used for assembly or other operations on permanent fixtures, the outlets are placed on the fixtures themselves. Switches are conveniently housed in cubicles built around columns in the work areas.

Practically all plants have inter-office telephone systems and autocall installations and some also have radio or public address systems.

PLUMBING AND SANITATION

By Chester T. Roe, Associate, ALBERT KAHN Associated Architects and Engineers, Inc.



Tri-boro Photos

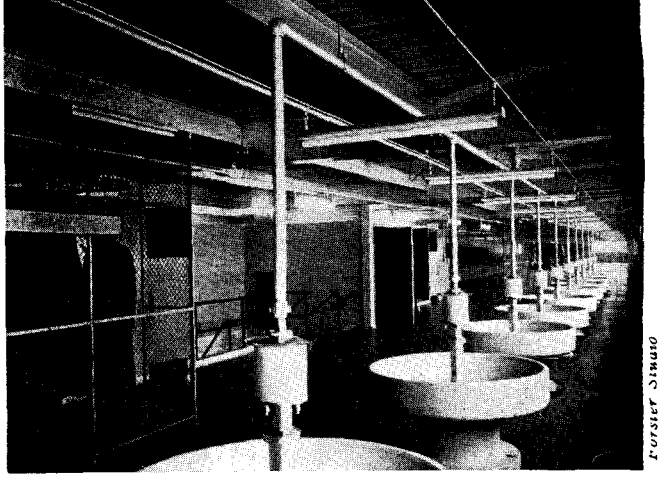
Lockers and wash fountains in a huge factory washroom

CURRENT DEVELOPMENTS in plumbing for industrial plants include the choice of new locations for toilet rooms, the handling of larger quantities of equipment than ever before, the saving of critical materials, and accommodation of an increasing number of women.

The practice of placing toilet rooms in the basement, rather than on mezzanine floors, is not new. It was introduced sometime ago by the Kahn organization, and it is now a widely accepted principle of industrial planning. Toilet and locker rooms, when located on the ground floor, took up much valuable space.

To free this space for manufacturing, our first step was to place them on mezzanines. Tool cribs, stock piles, and light factory work usually occupied the space beneath. This was an improvement, but the mezzanines themselves were in the way. This was seldom the case when the plants were first built, but as changes were made to meet the stepped-up production requirements of the war program, it became more and more apparent. Often it became desirable to install overhead conveyors, and then the presence of the mezzanines was a decided obstacle. If toilets were installed in the truss space, above crane and conveyor clearance heights, they had to be at least 16 ft. above the floor and have long stairways leading up to them.

During the early days of the defense plant period, we conceived the idea of basement corridors through which employees would enter and leave the plant. Stairways leading to the ground floor work area above were spaced at frequent intervals. This plan greatly relieved traffic con-



Many war factories use as much plumbing as large cities

gestion in and through work areas. Each employee entered the area by the stairway nearest his place of employment and left by the same route. Time clocks were located in the basement corridors. The basement became the logical place for toilet and locker rooms. Placing them there left the main floor entirely clear except for the small space occupied by stair wells with low railings.

In one plant, for example, a longitudinal corridor extends the full length, and a transverse corridor the full width, of the building. The longitudinal one, in fact, extends from the administration building through the basement of the factory and on to the boiler house which is some distance away, passing, in its travels, underneath a garage. All factory workers enter and leave the plant by means of these corridors. Toilets, coat rooms and time clocks are adjacent to the corridors. There is a waiting room directly inside each entrance where workers may congregate without blocking the passageway. Lockers are located near the main stairways. Employees are assigned lockers nearest their place of employment. The rest of the basement contains fan rooms, service rooms, a cafeteria, refrigerating equipment and various utilities.

Many war plants employ so many people that they use as much plumbing as large municipalities. If this sounds like gross exaggeration, consider the fact that some such plants have sewage disposal systems designed for 60,000 people. A majority of the new war plants are located outside city limits, necessitating, in many cases, construction of storm sewers and special drains.

All corrosive and dangerous process wastes must be handled separately through independent sewers. In the plant mentioned above, for example, there is a special sewer for acids and another for cyanide from the heat treat and plating departments. Both go to a neutralizing plant where their contents are rendered harmless. The gas is discharged into the air 40 ft. above grade.

Water for potable use is brought, wherever possible, from city mains. It is preferable to use city water for all other purposes also. City supplies, however, are sometimes insufficient. It is then necessary to drill wells.

Steel water tanks and towers are no longer allowed. We are designing wooden tanks mounted on towers built of wood or of concrete. One such installation consists of a 100,000 gallon cypress tank set 125 ft. above grade on a reinforced concrete tower built in the shape of a silo. The circumference of the cylindrical tower is 22 ft., its walls are 7 in. thick, and it rests on a footing of plain concrete. Ladders and landings are built in the interior of the tower in such a way as to allow space for hanging 100-ft. lengths of fire hose to drain. The base of the tower contains a pump pit. No frost casing is necessary because the pipes are protected by the tower itself.

Plumbing fixtures and equipment are now purely functional, materials being severely restricted. No more brass or plated faucets are permitted. Enamelled iron fittings with china or iron handles are being used. Toilet seats are of wood in place of hard rubber or plastic. Soil and waste pipes are of light "Victory weight" cast iron. All underground sanitary piping is made of vitrified tile. Vertical rain water leaders are made of asbestos-cement pipe. Galvanized pipe is still permissible for hot water lines, but black iron must be used for cold water pipes.

The restrictions on installation of automatic sprinkler systems are severe. It is not always possible to install them even in wood buildings. In general, installation is now limited to hazardous areas such as receiving and shipping departments, paint spray and cleaning rooms. Our usual practice is to run a loop main around a building with hydrants and connections at frequent intervals. This design allows us to bring in the protection, as plant operations change, where it is needed and permitted.

Precast cement manhole covers and catch basin strainers are being used to save metal. These are not too popular with plant maintenance departments.

Since plant equipment layouts are seldom ready when a building is first designed, we install, in plants where a large number of equipment drains are likely to be needed, special pumps with multiple inlets of varying sizes. When the number and size of the drains is known, they are installed and connected to the sumps. If the sumps are spaced at reasonably frequent intervals, much cutting of concrete floor and breaking into sewer pipe can be avoided.

The increasing employment of women in war plants brings up new problems of toilet room layouts. One closet is usually provided for every 20 women, as compared with one for every 25 men. There is always uncertainty as to the proportionate number of men and women for whom provision must be made. In any given plant, this can seldom be definitely established, and it must always be anticipated that the proportion of women will increase. We are meeting this problem by designing long toilet rooms with a stairway and an entrance at each end. A movable partition in the room separates the men and the women. As the proportion of either sex increases, the space can be adjusted accordingly, without changing piping, by relocation of the dividing partition.

The employment of an increasing number of women also brings an increase in the number of troubles with sewage disposal pumps. One large plant, which had previously had no difficulties, recently began to report frequent breakdowns. Because of stoppages, they were having to pull out their pumps as often as three times a week. The only solution possible is special pumps. Two types are available, an air-operated ejector, or a pump with a solid-retaining screen. Where pumps are already in use and cannot be changed, it may be necessary to install strainers, baskets, or even comminutors to chop up the material before it reaches the pump.

INDUSTRIAL PIPING

By H. D. Unwin, Mechanical Engineer, ALBERT KAHN Associated Architects and Engineers, Inc.

AN IMPORTANT PART of war plant construction is the installation of industrial piping—sometimes called process piping to differentiate it from the usual plumbing and heating service lines. This piping is directly associated with production. The pipes carry oils, gasoline, compressed air, ammonia, propane, oxygen, acetylene, hydrogen, and all other liquids or gases required for the operation of equipment, fabrication of parts, or testing of finished assemblies.

Problems of installation, already involved, have been multiplied by the need of saving critical materials. Specification for pumps take advantage of every possible economy. Higher heads are being used to reduce pipe sizes. The insulation of pipes has been reduced to a minimum, or omitted entirely.

In order to expedite construction we have often been asked to provide industrial piping systems to the final connections on production equipment machinery on the factory floor. To design the piping systems economically, we have had to obtain detailed information on machinery layouts and definite data on the requirements of each piece of equipment. Connections are made from overhead mains, branch lines being carried down columns to the floor.

The use of wood block flooring in manufacturing and assembly areas has greatly facilitated installation of branch distributing lines. The blocks are set in place prior to installation of the pipes. When the exact location of the equipment is known, a trench, extending down to the floor slab, is cut in the wood block. Pipe, with either welded or screwed joints, is laid in the trench between the column and the particular point where final connection is desired. The trench is then filled with a sand and cement mixture which is usually colored black to correspond with the wood block. The method obviates the necessity for overhead lines at the machines, conserves materials formerly used for hangers and supports, and eliminates the shadows that would be cast by connections from overhead.

Installation of storage facilities for gasoline and oils in aviation engine plants has presented some interesting problems. It is customary to plan for the storage and handling of several hundred thousand gallons of gasoline of various grades, and for thousands of gallons of oil of different types—lubricating oils, and cutting oils for steel, aluminum, magnesium, bronze, and brass. In order to keep tank cars and tank trucks rolling, extensive unloading stations are built which will empty the tanks in a minimum of time. Gravity unloading is too slow. By using pumps it is often possible to release a railroad car within 60 to 80 minutes from the time it is first spotted. Some stations are equipped to unload both tank trucks and tank cars. Some stations handle as many as ten or twelve different grades of material. Sometimes several types of oil are handled on the same unloading line; more often it is essential to segregate each type. The layouts of gasoline tank farms are made so that any grade of gasoline may be stored in any tank. Deliveries and consumption of the various grades constantly fluctuate, and flexibility is important.

It has been customary, and it is still desirable, to store gasoline and light oils in steel tanks. This was a simple matter when all the engineer had to do was to specify the size and construction of the tank. This easy method is out for the duration. New orders ban the use of new steel plate for tanks except under very special conditions. The procurement of used tanks has become an important part of our tank farm work. Thus far a little searching has brought desired results.

There are many and varied industrial piping systems. Installation of oil drains for chip handling equipment has many ramifications because different materials must be segregated and handled separately, and it is desirable to reclaim the soluble oils. Plating equipment drains, where poisonous acids are encountered, present other problems. Industrial piping is very closely allied to production because it brings the liquids and the gases to the points where the production men need them.

KITCHENS AND CAFETERIAS

By H. E. Sloman, Associate, ALBERT KAHN Associated Architects and Engineers, Inc.

NEARLY all new war plants are being provided with kitchens and cafeterias. The patronage of these services is already large, and it is on the increase. Many workers still bring their lunches. As they become more prosperous, however, more and more of them begin to eat in the cafeterias where they can obtain better food and warm meals. In many cases those who bring their lunches buy coffee or milk and perhaps something for dessert.

It is now estimated that 70 to 80 per cent of a plant's employees will use the cafeterias. Facilities are being planned accordingly. Many of the new plants are of immense size. Feeding thousands of workers is a large undertaking. The largest installation to date serves 26,000 meals a day.

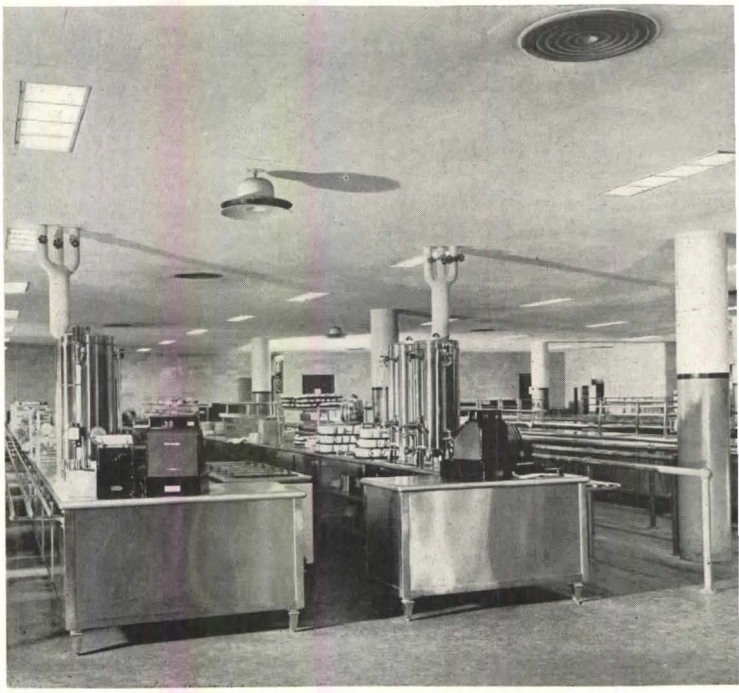
Some plants have a cart service, usually consisting of trains of carts drawn into the plant by tractors. At certain hours, workmen are served in certain areas including the lunch rooms. Such services are generally operated by

concessionaires. They are subject to thorough investigation and inspection by government authorities. Most of the larger plants are now equipped with lunch rooms containing cafeterias for factory employees and for office employees. Usually there is also a dining room for officials and visiting dignitaries. All are supplied by the same kitchen.

Kitchens, like the factories themselves, are laid out and equipped for mass production and the efficient flow of materials. Some of the larger plants have their own commissaries, and many operate their own bake shops for pastries and rolls, but not for bread.

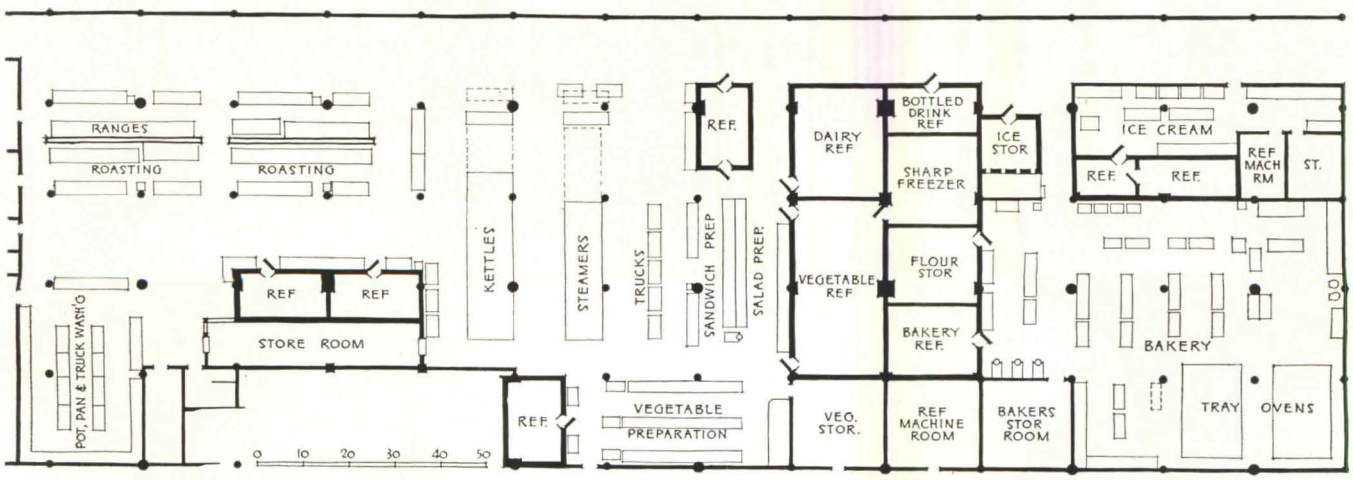
One plant which operates its own cart service, has a commissary designed to serve as many as 80,000 workers daily on the box lunch principle. Food storage and preparation areas of the commissary, housed in a separate building, are of glazed tile. Equipment is of the latest type. Thirty-pound steam and pump discharge lines enter the building through a service pit. Branches run to soup kettles, steam coils, bottle washers and coffee urns. The steam is then reduced to 5 lb. to serve radiators and blast coils, which in turn heat and condition air in other parts of the building.

There is also a steam room in which coffee is heated before being delivered to the workers in the factories. The coffee is made in large urns, bottled and placed in wood cases. In the steam room, the cases are heated to 180° F. just before they are taken out and delivered. By the time they arrive at their destination, they have cooled to temperature proper for consumption. The steam coil, consisting of three lengths of 1½-in. pipe, perforated every 8 in. with a ⅛-in. hole, is located under a perforated steel floor. Steam liberated into the room heats the coffee rapidly, as it wets the surface of the bottles and gives them more ability to hold heat. It also keeps the wooden cases damp, prolonging their life. In the 180° temperature, they would otherwise become very dry and soon fall apart. Air in the steam room is heated by pipe coils along the walls, thermostatically controlled. The thermostat hangs on the wall outside the room, with the bulb running through the wall so that the temperature may be controlled from the outside without opening the door.



It is estimated that from 70-80% of employees eat in factory cafeterias. One of the largest serves 26,000 meals every day

Cafeterias are usually located in the basement, often on either side of a kitchen. The cafeterias for factory



Kitchens, like the factories themselves, are laid out and equipped for mass production and efficient flow of materials. This plan represents but one section of the total area for receiving, storing, preparing and serving food in a recent aircraft plant

employees and for office employees are identical, except in size. The larger installations have two parallel counters on either side of bains-marie—basins in which food is kept warm. Steam tables, coffee urns, and cold drink equipment are in the counters themselves. One counter usually serves hot foods and the other sandwiches. The latest development, however, is the subsidiary kitchen to which food comes from the main kitchen, and where it is kept in warmers or refrigerators until served.

Food supplies are brought into the factory daily. Everything is weighed and checked before it enters the storage rooms. Due to the scarcity of many food items, the size of refrigerators is being increased, making it possible to store larger quantities and avoid shortages.

Increased refrigeration is also being provided for temporary storage of garbage. A large plant will produce as much as 110 cans of garbage a day. A few days' accumulation amounts to several hundred cans. The refrigeration protects the garbage before it is sold for its fat and oil value. Some plants operate incinerators, but the tendency is to reclaim valuable ingredients instead of burning them.

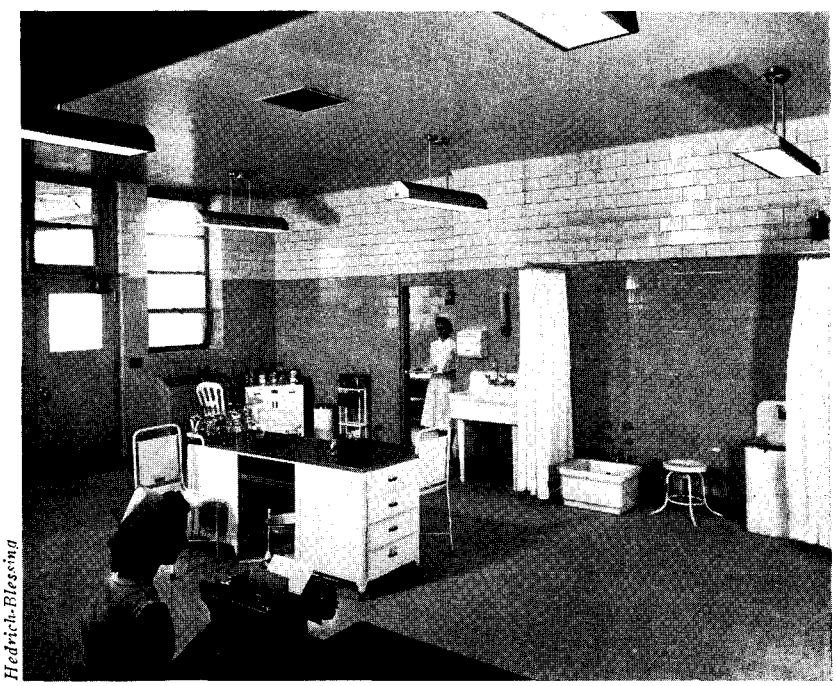
Restrictions on the use of critical materials have necessitated many changes. Aluminum, stainless steel, copper, bronze, silver, and even ordinary steel are restricted.

MEDICAL DEPARTMENTS

By F. A. Fairbrother, Associate, ALBERT KAHN Associated Architects and Engineers, Inc.

THE FIRST AID department of the modern American factory has become far more than the name normally implies. Originally established to render help in emergency cases and to take care of minor injuries, departments at first occupied only a drawer in the desk of an office. The equipment consisted of an inexpensive first aid kit. Perhaps there was a stretcher in the corner of the room.

In time, the first aid department became a medical department, with specially equipped rooms located in or near the work areas. Extensive examination departments grew up. Now factories often have separate hospital buildings containing examination rooms, first aid rooms, operating rooms, hospital wards, laboratories and other facilities of the most modern type. In contrast to the early first aid stations which had no attendant in charge, departments of today have medical staffs of directors, doctors, registered nurses, industrial hygienists, chemists, technicians, and assistants.

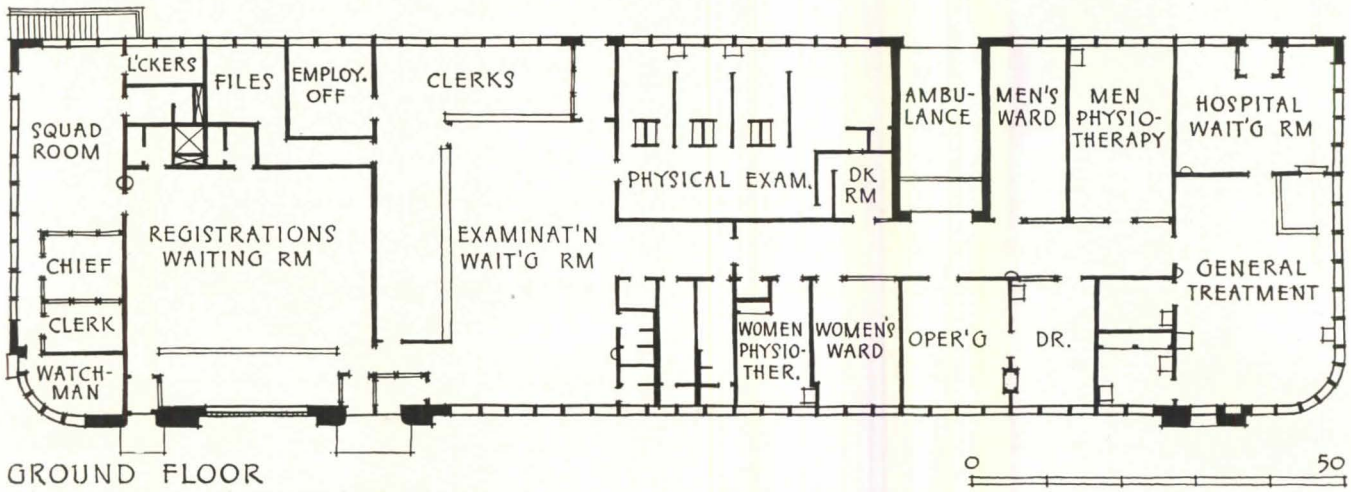


Hedrich-Blessing

In the modern plant, the first aid department, once contained in a desk drawer, is a complete medical department, sometimes in a separate hospital building

In spite of extensive equipment, the function of an industrial medical department is usually limited to examination, analytical and research work, emergency and temporary treatments. The department works in close cooperation with private physicians of the city, referring to them all ailments of a non-occupational nature. In a factory of several thousand employees, there are many such cases each day.

The department cooperates with the medical profession in stressing prevention of illness as well as cure. All applicants for employment are subjected to a thorough physical examination. Those who have communicable diseases are rejected. Thereafter, if an employee becomes ill and is absent for several weeks, he is re-examined before he returns to work. If any disease becomes prevalent in any department, all employees in that department are examined. It may be that one employee has contracted the disease and is innocently communicating it to others in the plant. Then, too, many people are allergic to certain things. Handling certain materials may cause one employee to develop a rash or to have a headache, whereas handling the same material may not affect others at all. Making chemical analyses of materials, eliminating toxic elements, transferring employees outside zones in which they suffer,



Plan of a separate hospital building for a large plant engaged in war work. Not intended to cure all the workers' ills, the plant hospital usually specializes in preventive measures and conducts examinations to discover illnesses before they become serious

has resulted in reducing these troubles to a minimum.

The work of preventing occupational diseases is constantly being carried on. A few years ago, for example, many cases of lead poisoning developed in certain factories. One company spent about half a million dollars eradicating this hazard in its plants. Chemical analysis revealed that lead dust from certain grinding operations was causing the trouble. An extensive ventilating system was installed to remove the dust at its source. A vacuum cleaning system was also installed, workmen were furnished with respirators, a separate washroom was provided for the exclusive use of workmen in the affected departments, and strict rules were enforced. At the time of the last report, there had not been a case of lead poisoning in that plant for three years. As a precaution against recurrence, nevertheless, all employees in the departments concerned, regardless of occupation, are being given monthly blood tests.

Such studies and investigations are continually being carried on. As dust is the villain in most cases, chemists with dust impingers are frequently seen in factories, collecting samples for analysis. Preventive measures are of major importance to employer and employee alike. Superficial abrasions, cuts, bruises, "something in the eye," headaches and colds receive great attention. If they are not promptly and properly cared for, they may have serious consequences, not to mention loss of time and delayed production.

One small plant with only a few hundred employees reduced absences by 90 per cent merely by employing one nurse to take care of its first aid department. Before she came employees had usually neglected their minor injuries, and they never thought of going to the first aid when they had a headache, a fit of indigestion, or the symptoms of a cold. When the nurse was employed, every employee who sustained an injury, no matter how minor, was required to report for examination and treatment.

The medical services are entirely free to employees. Their cost to the employers is small compared to the cost of the delays involved in long and disruptive absences. It is sometimes believed that they are furnished primarily to avoid responsibility under Workmen's Compensation Laws. This is certainly not the case because most of the absences are not of sufficient duration to warrant benefits.

A description of two of our recent projects will serve to show current practices in the larger plants. In one plant, the medical department occupies an entire wing of the office building. It has facilities for examining and rendering first aid to 10,000 employees. It comprises offices and rest rooms for the staff, dressing rooms, a general laboratory, examination rooms, operating room, waiting rooms, physiotherapy and first aid section, totaling 17 rooms in all. The entire section is air conditioned and equipped with fluorescent lighting. The color scheme is restful green. In this plant the medical department adjoins the personnel department of the factory. The plan is so arranged that it allows continuous circulation from the personnel office through the various rooms and back to the office. There is an ambulance in attendance.

The staff consists of a medical director and sixteen assistants. Most of the assistants are technicians who specialize in subjects such as eye examinations, X-ray, blood tests, or chemical analysis.

In another large plant which we have recently completed applicants for employment are examined in the personnel building. The hospital in this case is located by itself in an entirely different part of the plant. Equipment includes a modern operating room, complete with the latest instruments, sterilizers, blanket warmers and other necessary devices. All the sterilizers and like equipment which use steam are recessed. Only the valves and the ends of the units are exposed in the room.

The personnel of industrial medical departments and all factory employees who are engaged in protection of the plant are now required to take the Red Cross course in first aid, and to be on hand in case of emergency.

DESIGNS FOR SUBURBAN STORES

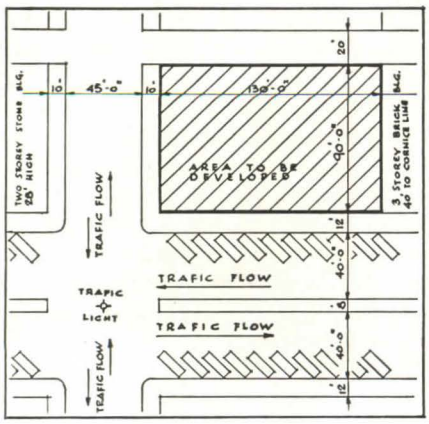
The prize-winning designs submitted in the recent competition, conducted by the Beaux Arts Institute of Design, offer a range of stimulating ideas for store groups in connection with present-day housing developments or later investment properties.

THE PROBLEM presented to the designers was to show the possibilities of providing four distinctive rentable stores in a prosperous suburban community. The stores were to be distinguished in exterior character but not to be so individual that they could not readily be changed to suit some future tenant.

The four stores to be accommodated were:

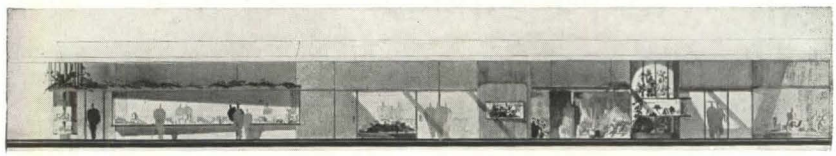
1. A Cash-and-Carry Market
2. A Drugstore
3. A Haberdashery
4. A Florist Shop

The market was to occupy an area of approximately 4,000 feet of sales space. The remainder of the building area was to be divided into three approximately equal rentable store units, each with its store front and window display. The building was to be one story in height, with a full basement under each store. The lot chosen was considered to be a northeast corner, approximately 130 feet on the avenue by 90 feet on the street, as is shown in the accompanying diagram. Robert S. Hutchins, architect, of New York, prepared the competition program.

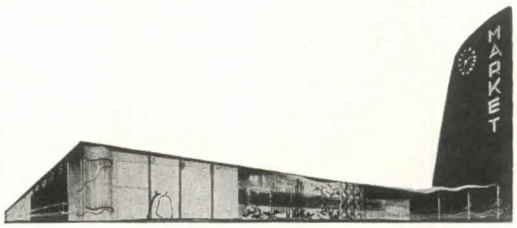


Cash prizes were offered by the Kawneer Company, of Niles, Michigan, for the best solutions, and were awarded as follows:

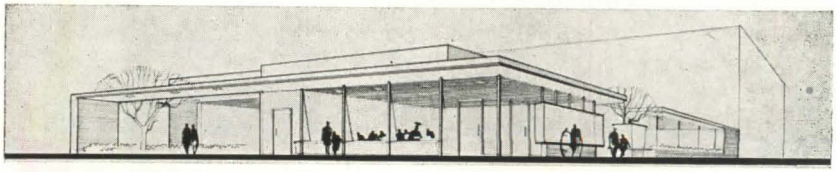
FIRST PRIZE $100.00 . . . . W. K. Vivrett, University of Illinois. . Page 68



SECOND PRIZE $75.00 . . . . H. E. Schroeder, University of Illinois. . Page 69



THIRD PRIZE $50.00 . . . . V. Lubelsky, New York University. . Page 70



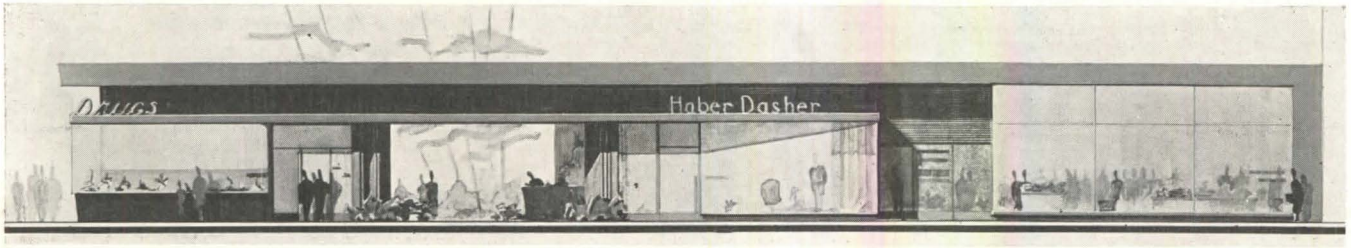
FOURTH PRIZE $25.00 . . . . C. A. Rubinelli, University of Illinois. . Page 70

THE JURY OF AWARD consisted of the following architects:

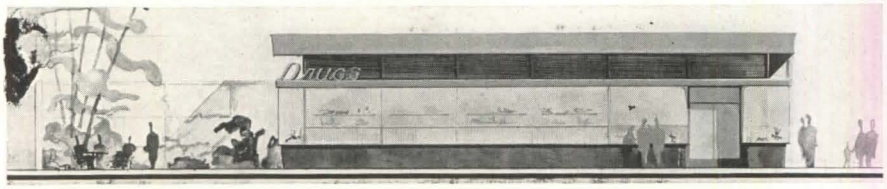
LOWELL CHAPIN	ROBERT ALLAN JACOBS	GEORGE NELSON
LEWIS G. ADAMS	HOWARD GREENLEY	LAWRENCE J. PLYM
ALFRED FELLHEIMER	MORRIS KETCHUM, Jr.	*KENNETH REID*
J. ANDRE FOUILHOUX	HARRIE T. LINDEBERG	KENNETH K. STOWELL

FIRST PRIZE

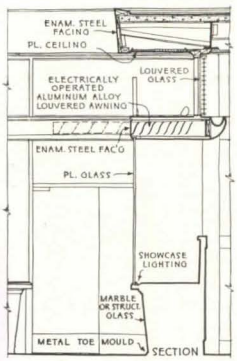
Design by W. K. Vivrett

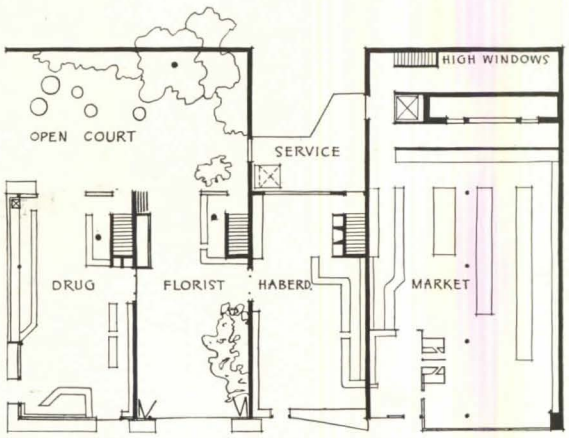


AVENUE ELEVATION



STREET ELEVATION

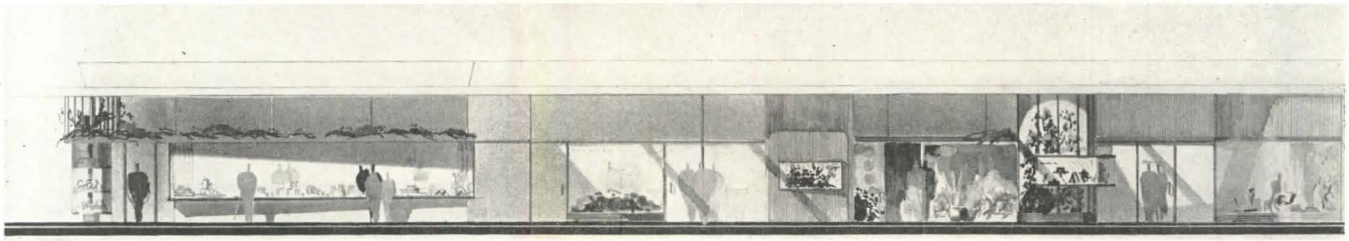




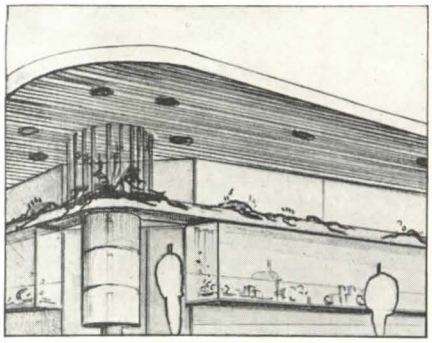
THE FIRST PRIZE design offers a store group that is unified in its design, distinctive and attractive in appearance, unusual in arrangement. While each store is distinct, it would be entirely possible to convert any one of them to the selling of a different type of merchandise, without great difficulty. The arrangement of signs, and their illumination from the recess behind them would be attractive both day and night. In planning, the drug store is given the corner position, and there are three access doors. The unusual open court at the rear could serve both as a display area for the florist, and for outdoor fountain service from the drug store. Show window space for all the stores is adequate and well arranged, with sufficient differences in design to make each store distinct. The service court and entrance are well located to take care of the delivery of merchandise. The section shows an ingenious louvered awning which can be extended from the facia immediately above the show windows.

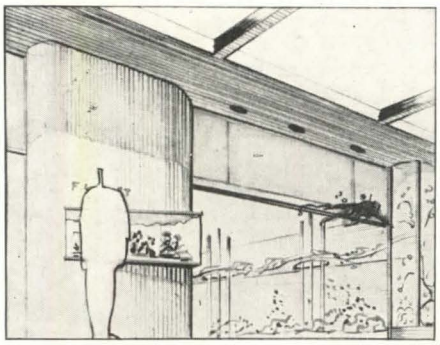
SECOND PRIZE

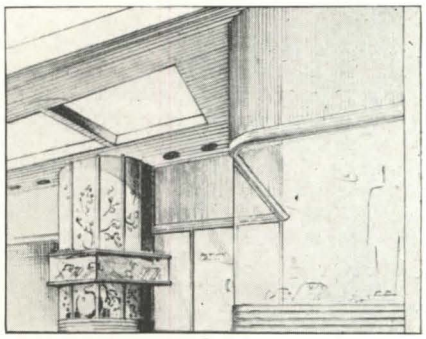
Design by H. E. Schroeder



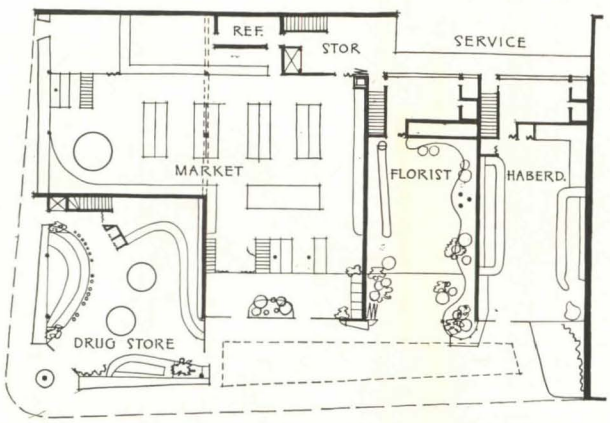
AVENUE ELEVATION

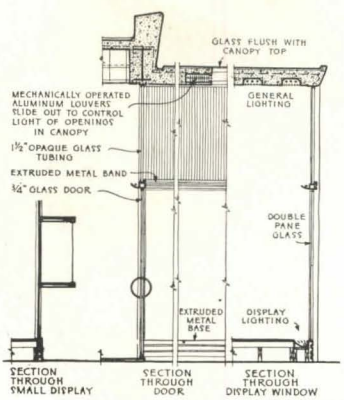






THE SHOW WINDOWS

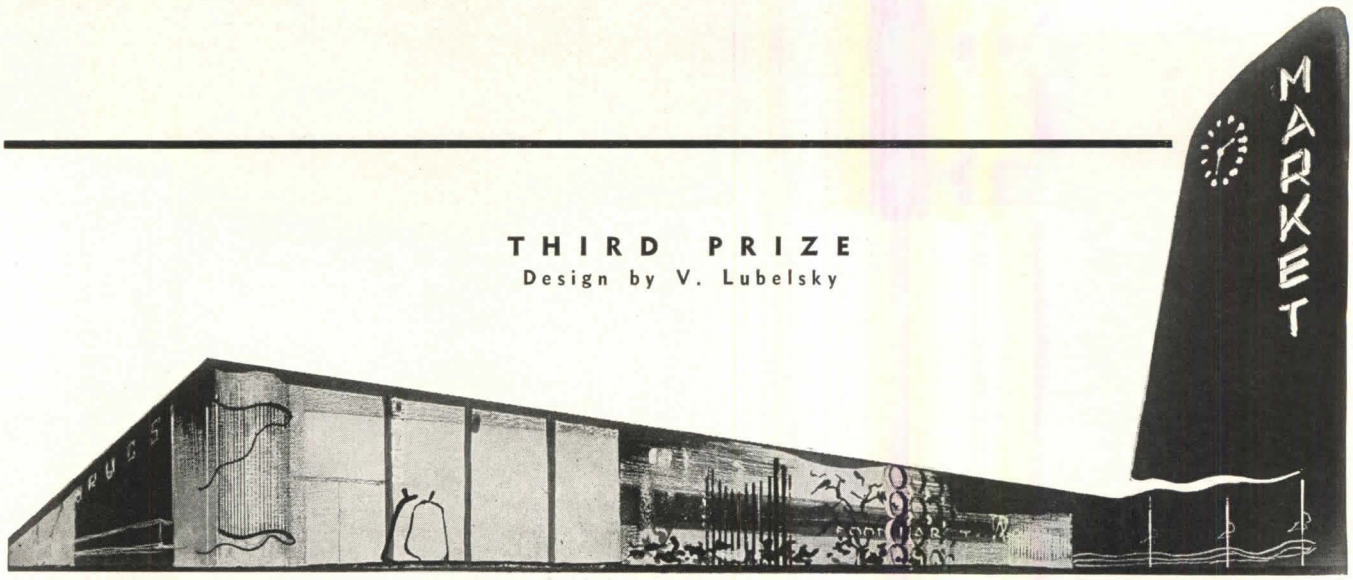




THE EXTERIOR treatment of the show windows of this design is both attractive and ingenious and its plan is practical and flexible. A covered recess on the avenue side gives access to the market, florist, and haberdashery shops, encouraging customers to pause to view the windows without being jostled by hurrying crowds. Display cases and show windows, as shown in the sketches above, are varied in size and location, and are therefore effective settings for wide ranges of merchandise. The market has entrances from both streets and is so arranged that it could be divided to provide delicatessen service nights and Sundays, without opening the whole store. The drug store has three convenient doors and is strategically located on the corner. The stores are distinguished in design, and yet can be converted to the selling of different types of merchandise, should occasion arise. To make five stores, the plan could be altered easily with a minimum of partition work and the addition of one stair to the basement.

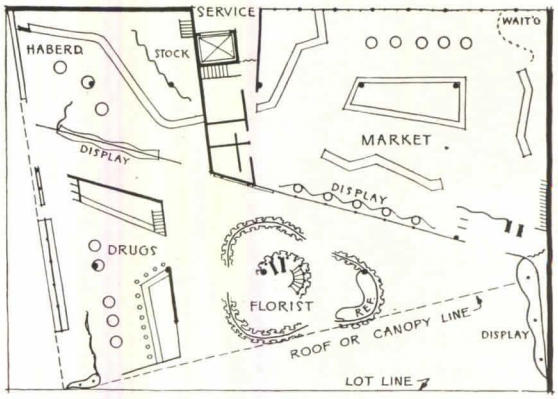
THIRD PRIZE

Design by V. Lubelsky



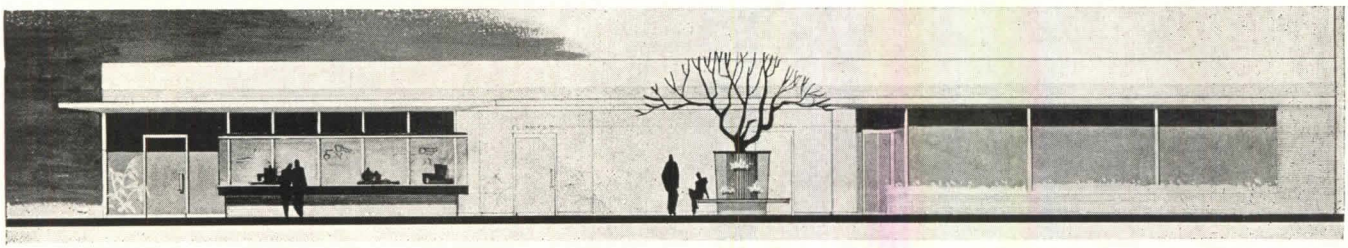
AVENUE ELEVATION

ONE OF the most striking designs submitted in the competition departs radically in plan from the usual rectangular spaces and provides more "free and dynamic space" by an angular arrangement allowing a short cut arcade from street to street. The novelty of plan and display would undoubtedly create public interest. Free circulation to all stores, with maximum show window areas, is attained in such a plan as this. The amorphous glass-enclosed florist shop forms an island focal point which can be viewed from all sides. The tall market sign would undoubtedly attract attention and serve as a landmark for considerable distances in a suburban area. It is possible that, unless the developer could find unusually progressive store proprietors, there might be difficulties in finding tenants for so unusual, if exciting, a scheme.



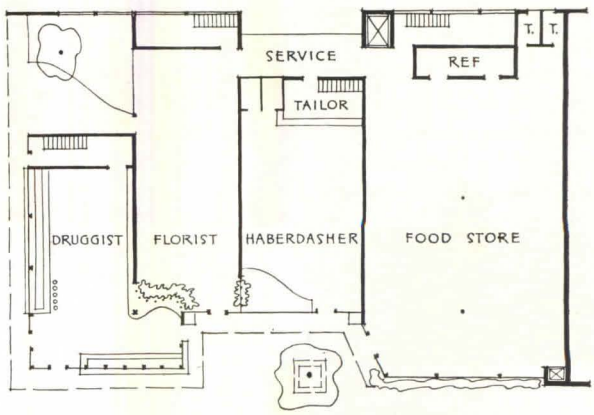
FOURTH PRIZE

Design by C. A. Rubinelli



AVENUE ELEVATION

THIS DESIGN is somewhat similar to the first prize design in general arrangement, in that it has a drug store on the corner, the florist shop next (with entrances from two streets), the haberdashery shop third, and the cash-and-carry market the large store at the end. It also has two store fronts recessed, *providing* a kind of fore court; in this case the recess is made attractive by the introduction of the tree surrounded by a seat. The service space is minimized, and is centralized at the rear so that it serves all of the stores except the corner drug store. The store fronts are simple, straightforward, ample, and attractive. It would be an easy-to-build project because of its utter simplicity, and the stores could be readily adapted to fit any types of tenants without great expense for alteration.



What is happening in school buildings in wartime marks a trend that undoubtedly will continue after the war, and will have lasting effects on school building design. Here the gymnasium of a girl's high school in Holland, Mich., has become a machine shop for the training of war workers. Adults are going back to school; later they may return to train for peacetime pursuits. Parents as well as students will require facilities for arts and crafts, for meetings and recreation. As in this case (see page 82) new school buildings will be required, and their plans will show much more than mere "classrooms"

NEW SCHOOLS AFTER THE WAR

by N. L. ENGELHARDT

Associate Superintendent of Schools, New York City

SUCCESS in the war program is based upon education. Success in the postwar period will come to that nation which most widely spreads the opportunity for educational advancement.

During the present war this nation has engaged in the most momentous educational program of all time. A people trained for peace had to be reeducated in a few short months for the activities associated with a worldwide war. The record made in the year that followed December 7, 1941, was a remarkable one of readaptation of a people to new work, the handling of new materials, and the adjustment to new situations quite unlike those encountered by the same people during the days of peace. Men and women, whether they have entered the Army or the Navy, the Marines or the Air Forces, the Waves or the Waacs, have first been introduced to their new military work through programs of education. The laboratories for instruction have been the Army camps, the great out-of-doors, ship decks and airplane hangars, as well as school and college classrooms and laboratories wherever they could be advantageously used.

Out of this war program of education will emerge new concepts of what constitutes the desirable facilities for an educational center. Without doubt many will come back home from the war activities with the understanding that the formal classroom setting is not a prerequisite to effective learning. Many will have found that other media of learning besides the textbook may help in expediting the learning process. Others will have realized that the curriculum is most fascinating if and when it is an outgrowth of immediate personal and group needs, while there will be those who will carry back to the home community new ideas about the instructor-learner relationship. Their experiences will show that both teacher and student profit most when the principle of mutuality of responsibility and participation is applied to the ever inseparable processes of teaching and learning.

The civilian population, also enlisted in the war service, has been subjected to educational programs of many kinds. Millions of adults have literally gone back to school to learn about nutrition, nursing, air-raid protection and the problems of first aid.

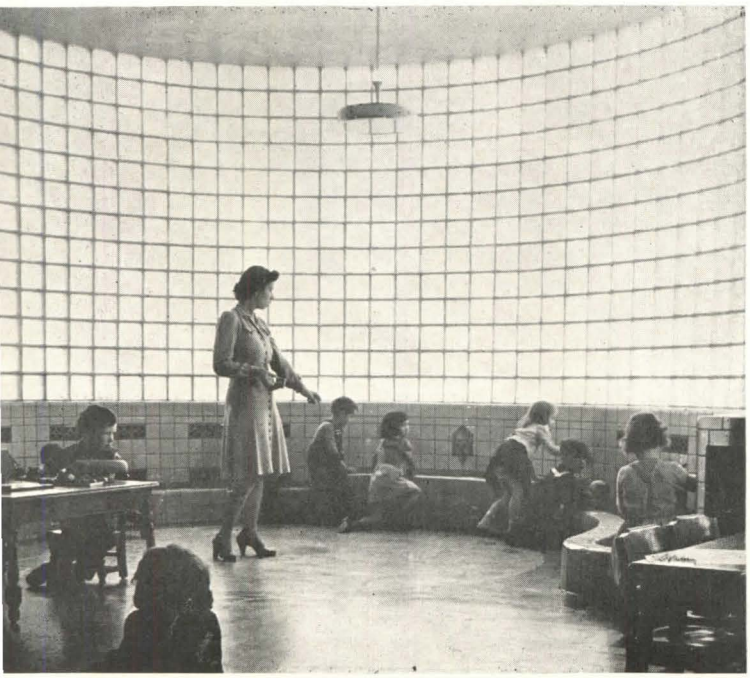
In these civilian educational programs, daily needs constituted the curricular material, the laboratories of learning were not limited by four walls, and teacher and learners were constantly exchanging positions.

From both the military and the civilian programs many ideas about education will be gleaned. Some will be new, others will repeat century-old experiences. It is clear that the postwar period will show an awakened interest in broad programs of adult education. Community interests and the schools program will, no doubt, be linked more closely together than ever before. The needs of the individual will meet with more constructive consideration than in the past. The guidance aspects of teaching will be stressed and the classroom may be expected to become that kind of workshop or laboratory in which teacher and student work democratically toward their common goals and many other learning media supplement the textbook in the teaching and learning processes.

The world around us is constantly in change. The year 1942 brought about as much significant change in the

thinking of the American people as perhaps resulted from the entire previous decade of thinking. New world concepts were being grasped for the first time. The inter-relationship of nations was discussed at many a forum or through the columns of the press. The cause of this upheaval was the struggle among the forms of social orders. The American people entered the conflict in order to protect a way of living called "Democracy." With all of these changes, and with this basic objective of maintaining democracy, is it not reasonable to expect many changes in democracy's schools built after this war?

Perhaps another question should first be asked: If one were deliberately planning the school buildings of a democracy, would they differ from those of a totalitarian or communistic state? If so, in what particulars? Most of the distinctive features of our schools do not have their origin in planning for the democratic way of life, but certainly bear the traces of military and social influences of continental Europe in years past. To be sure, as evidenced in Vischer's *Der Neue Schulbau* and in Minucci's *Scuole,* European nations diverted considerably after the first world



"How Times Have Changed" might be the title of this picture of a tile pool and sand box in the kindergarten of an elementary school in St. Clair, Mich. Warren S. Holmes Co., architects

war from traditional patterns of school building planning. Architects coming out of the trenches threw overboard old forms of planning and moved toward functionality in planning, with emphasis on the advantages of sunshine and fresh air. In the 1920's, Continental Europe progressed much in school building planning—in fact probably more rapidly than did this country during that period. The stress during this period was toward opportunities for the individual, the improvement of the physical body, the interpretation of the technological age, the increase in social understanding and the liberation of the curriculum. The forces of darkness soon throttled these advances.

In a democratic social order, should the auditorium or the cafeteria have distinctive characteristics which assist in achieving the aims of that society? Will the gymnasium be a different kind of place than the turn-halls or palestra of a Nazi-Fascist state? How should the classrooms be planned to insure the freedoms heralded as our fighting objectives? What should be the nature of the administrative offices and what the characteristics of the library? In Fascist Italy libraries in schools are fairly rare and then are kept under lock and key. In America can the school of tomorrow reflect truly the underlying purposes of the society to be served?

Perhaps, first of all, schools may be planned so that there may be participation in the planning and administrative processes on the part of teachers, students and parents, as well as the administrators themselves. How can the administrative offices be developed to aid in the preservation of the democracy for which young Americans have given their lives in lands throughout the world? The administrative offices of a school should be so planned that there may be lay, staff and learner participation in administration. The principal should not make all of the decisions. There are community advisory councils, teacher councils, cooperative projects, student councils, and student activities growing out of their own peculiar needs. Provision must be made in school planning so that administration is more intimately integrated with the whole life of the school rather than set apart from the learning and serving functions of the school. The relationship of teacher and pupil cannot be that of autocrat and subject but must resolve itself into the harmonious attack on problems of common interest. This means that the classroom itself must take on characteristics which admit of the desired human adjustments and make for individual growth and opportunity.

The school of tomorrow will be distinctly a community school. The home, the farm, the factory, the parks, the libraries and the museums are simply a few of the educational resources of the community that must be integrated into the school program. The school plant itself should include the museum of community achievements and resources, and all of the facilities of the school should be made available to all members of the community. The war has opened schoolhouses throughout the United States for twelve and even twenty-four hours of the day. These schoolhouses will never go back again to the five-hour program of the past. This means that schools must be planned to meet adult as well as child needs. They must be planned specifically as the focus of redevelopment of the lives of millions of youths coming back from the war, as well as millions of stay-at-homes who will need learning adjustments to the postwar period of production.

Future schools will be allotted more land. America has an abundance of land and more of it should be devoted to educational purposes. Health and physical education programs will continue to expand after the war as they have during the past year. Perhaps America has learned once and for all that its youth must be made strong and that no nation can afford a lapse in the program of physical training. This means physical training facilities in every school of such abundance and character that individual as well as mass needs can be cared for. More constructive planning must be done for out-of-door opportunities in

physical development. Our schools should be so planned that there is inbred in children a love for the out-of-doors. Sports adjusted to changing weather must be planned for because it is just as essential that physical education be taught when it rains or snows as when the sun shines.

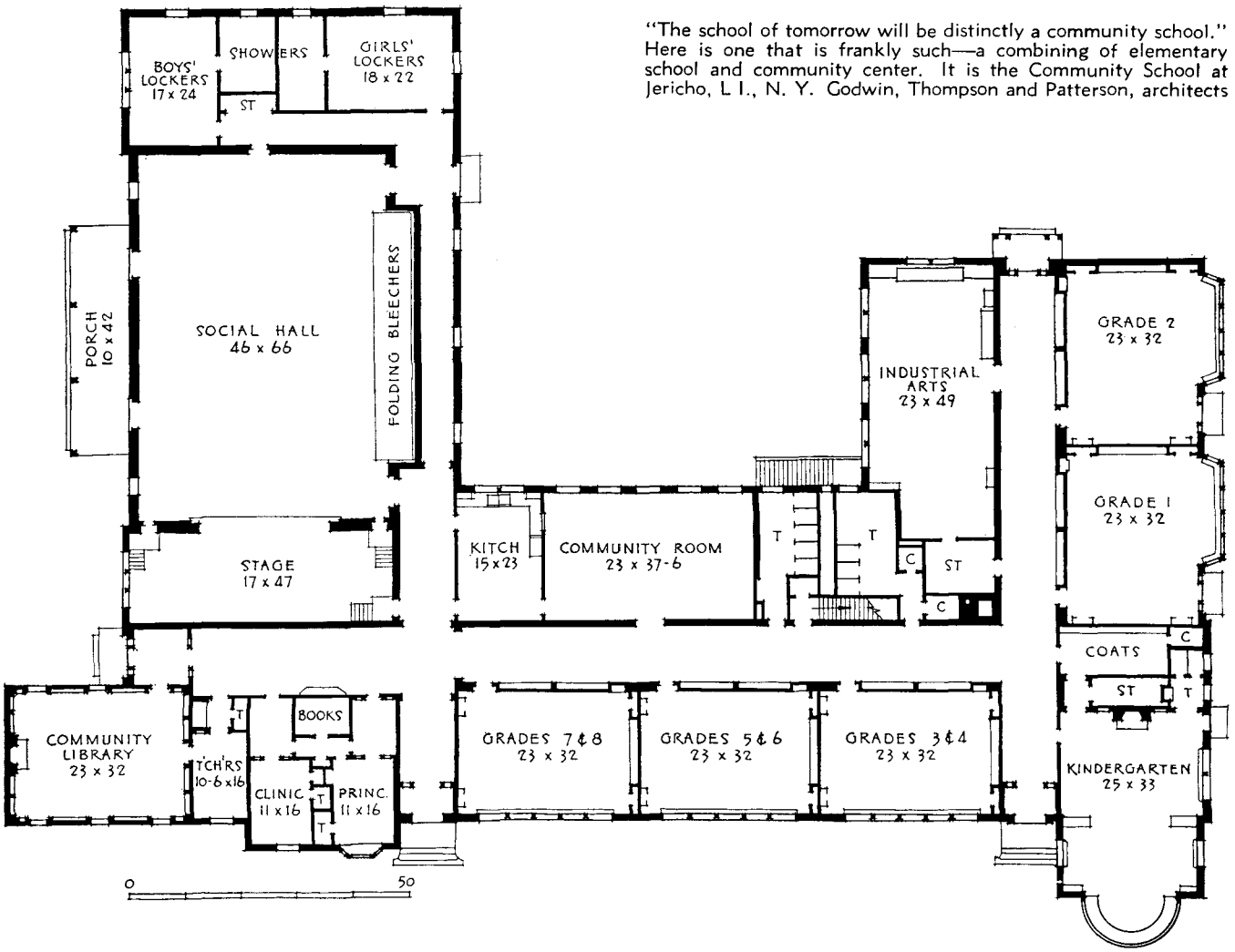
Camp should be an adjunct of the school, not camps for the summer only, but for fall, winter and spring as well. It will be to youth's advantage to learn to know nature in all its moods and facets. Architects may well begin conceiving of such all-year-round camps and giving an approximation of costs for such facilities.

The program of the elementary school has improved consistently in recent years. Teacher requests have resulted in associating workrooms with classrooms, or of planning classrooms sufficiently large so that group activities may be carried on in various parts of the room.* The broadening influences of the elementary school advancements have long been felt in the junior and senior high school. The result is that many high school educational spaces are taking on the characteristics of laboratories. Mathematics rooms have been planned with workrooms adjacent for the making of exhibits and models. Social studies laboratories have been thought of as not only providing for recitation purposes but also for making possible a maximum of exploration and invention as students have been guided through the maze of new national and world problems.

School planners must recognize that the present world upheaval will stimulate much curriculum reconstruction. This will frequently be carried on through joint study of teachers and students. The analysis of world economic and political change through the development and interpretation of large projects involving the integration of subject matter in many fields points to the need of laboratory facilities in the social studies area.

The English language classroom becomes a laboratory in which the drama, the speech arts, and the reading arts are emphasized through proper functional planning. In past planning the physical sciences have profited from the laboratory concept of planning. In future buildings all phases of subject matter should be given the advantages which accrue from thinking of instruction as associated with the

* See *School Building Portfolio A—Elementary Classrooms.* By N. L. Engelhardt and School Planning Associates. Bureau of Publications, Teachers College, Columbia University, 1941.



"The school of tomorrow will be distinctly a community school." Here is one that is frankly such—a combining of elementary school and community center. It is the Community School at Jericho, L I., N. Y. Godwin, Thompson and Patterson, architects

materials of man's environment and the symbolizations in their many forms which man uses to express his ideas.

The auditorium* and its stage can be made the most significant laboratory in the entire school. The heart of the auditorium is the stage and its ancillary spaces. If these are poorly planned, the auditorium serves relatively few purposes properly. The stage, with its adjoining stagecraft laboratory and in proper relationship to the music and arts department, can become the focus of creative learning in every community. Architects planning the auditorium ought to give consideration to the democratic relationship between audience and spectators. The public forum is a democratic learning device which is with us to stay. The desirability of the school auditorium, the audience of which is broken into two parts by a balcony, may be questioned where an interchange of ideas and the creation of common understandings are sought. The cost of a large school auditorium is difficult to justify if the space is used only five to ten per cent of the school day. In many schools, auditoriums of less than school capacity size, preferably seven to eight hundred seats, may serve educational purposes more adequately and may readily be planned for multiple uses.

The school cafeteria should be a place in which the school teaches social customs and permits the opportunity for the exercise of good manners. Here there ought to be freedom from tension and unnecessary noises, from crowding, pushing and disagreeable handling of food. The cafeteria can become one of the most significant of school laboratories. The luncheon period ought to be a significant moment in the pupil's day. The seating arrangements of the cafeteria should be informal. Its service facilities should be such that students can put into practice in the cafeteria the teachings of the other classrooms of the building. In every sense should the cafeteria be a training center not only for those who work therein but also for students who should be trained to work in food service areas. Dark basement cafeterias cannot be justified on any count. Let cafeterias have fresh air and sunlight. Let them serve other groups before and after the lunch periods. Let them be social halls in which junior civic clubs carry on constructively in the community interests. In atmosphere and teaching equipment, they should reflect the growing emphasis upon proper foods and their values.

The school library must also serve as a community library. It is not only a place where books and other materials are made available to students but it should be thought of as one of the guidance agencies and training agencies of the school. It is interesting that when America's army went into North Africa they were equipped with regional maps secured from the New York City library. The school library in every community should think of itself in a similar role as a service agency to meet the needs of the community. The library should be the central storehouse for the entire school. Not only books but pictures and paintings, films and film strips, and all other learning materials which call for individual distribution should be centered here. The library's function in a school and community must be expanded. Therefore, its location within the school unit must be given primary consideration.

The war has emphasized the importance of the values to be derived by all students from industrial and vocational training. The shops of the new school should not be restricted in their planning and should be developed with due consideration to future expansibility. In many situations these shops can be apart from the main structure of the building. Their construction can be simply conceived. In fact, part of the program of many a school can be the continuation of shop construction by boys as they are trained and as further needs arise.

New types of shops will be introduced into school plans. The war's emphasis upon flying, transportation, gliding, salvage, substitute materials and radio will no doubt have its reflection in shop plans. The vocational facilities for girls will also find their extension in nursing facilities, child-care provisions and adaptations of wartime activities.

In future planning, architects will profit by questioning any traditional or standardized layout of space. Certainly the commercial department, the art department, the home economics division and the physical sciences will emerge from this war period with significant curricular changes and with stresses upon new phases of subject matter. More machines may be expected to render business service, the camouflage of war art may have its prototype in peace, substitutes in food, clothing and shelter suggest expansion in home arts teaching and the growth of transportation and communication will not be ignored in the science categories. When subject matter changes, space adjustments may be expected next.

Today courses are being given throughout the country for the adjustment of teachers at all public school levels to the new problems of the day. The new curriculum thinks in terms of a global world. It envisages changes in the relationships of nations. It recognizes the differences that will arise in the economic and social status of races and nations. The new curriculum will stress the fact that man must be strong physically in peace as well as in war. It will acknowledge that the schools cannot lag behind the technological developments of the age. The new curriculum suggests that time, space and distance have been contracted and that there are hundreds of new educational problems associated with these changes of man's relations to space.

The site of the future school will be extensive. The plant may be decentralized. The facilities will provide for more extended opportunities than in the past. Community needs will be served. The school day will be longer. The school plant will be open the year round. The school will serve adults and children alike. The curriculum will grow out of the needs of the people and will select the contributions out of the social inheritance of the past.

The United Nations will win the war. The United Nations must conserve the peace. Educators and architects planning schoolhouses for tomorrow have the responsibility of providing the kinds of spaces and planning the kinds of structures in which man can teach youth as well as learn himself to make his greatest contribution to the maintenance of the peace. The schoolhouse of yesterday can contribute very little to the schoolhouse of tomorrow. In the new school facilities man must be able to demonstrate that he can plan the physical facilities which are adjusted to the great changes that are taking place in man's struggle against the forces of evil.

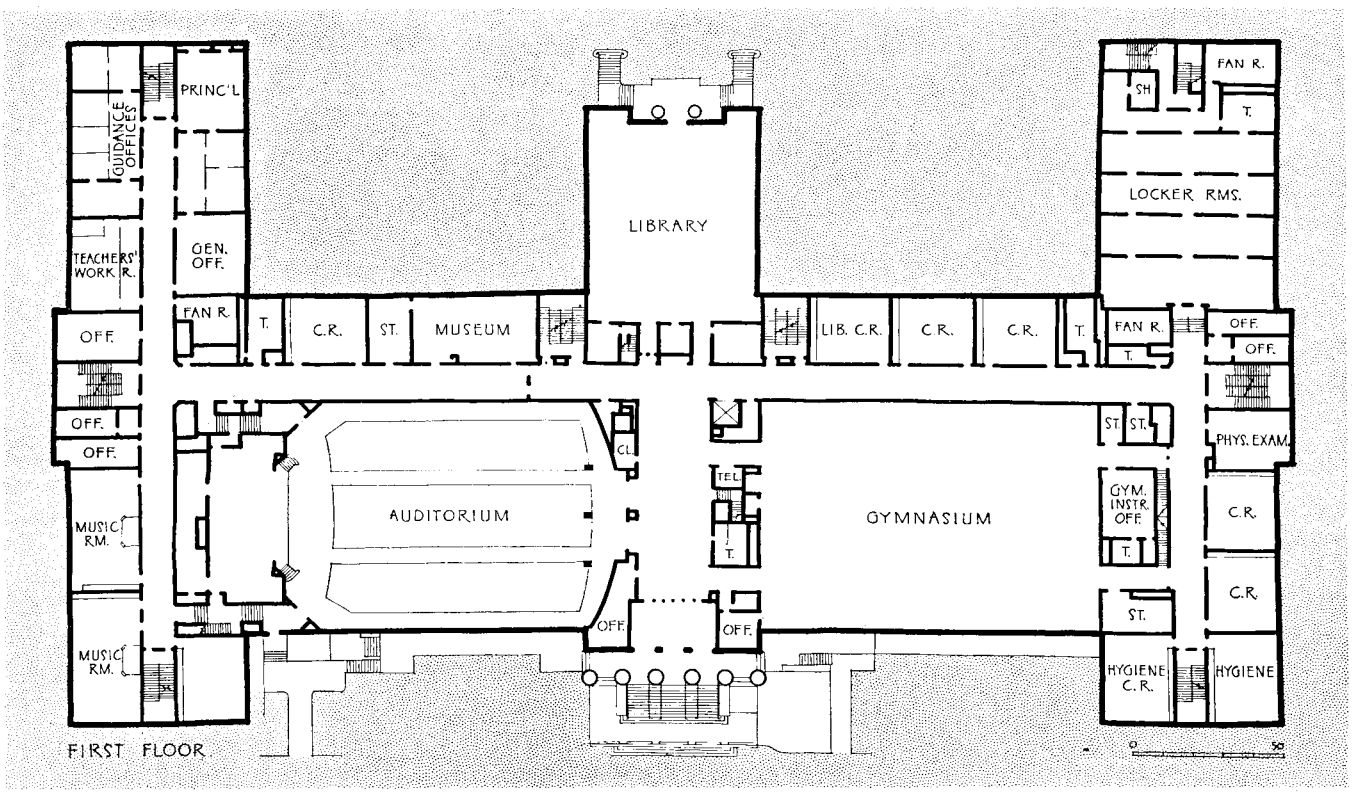
* See *Planning the Community School*—Engelhardt & Engelhardt. American Book Company.

COMMUNITY HIGH SCHOOL

Benjamin Franklin High School, New York City

Eric Kebbon, Architect

Even in the great city, today's high school shows conscious intent to develop its usefulness as a center of community activity. Here the three elements most important in this respect—library, auditorium and gymnasium—are grouped around the main entrance, such direct access permitting their use by the public without disruption of normal school work. There is a second gymnasium on another floor which adds to the facilities for physical training, now growing in importance in the school program.

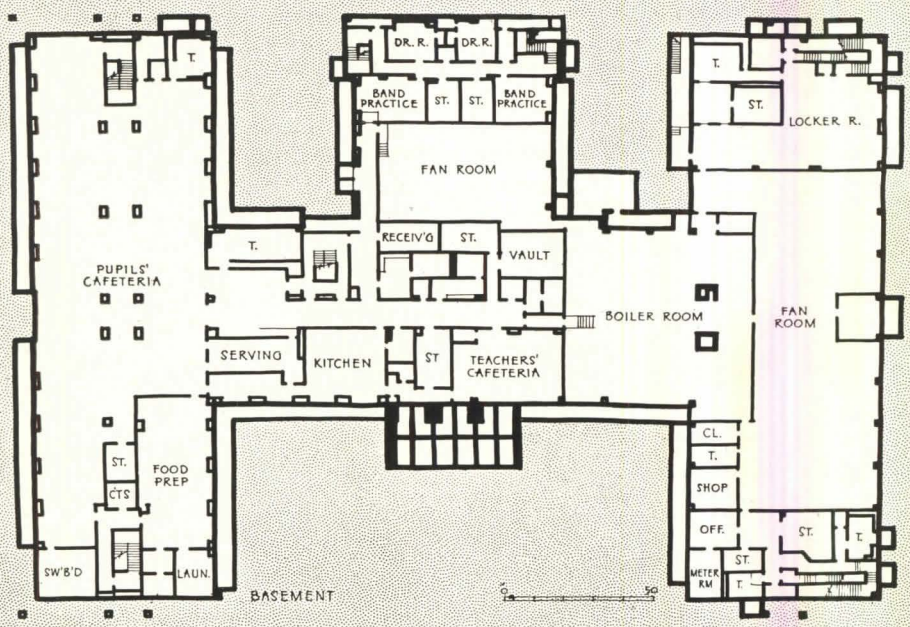


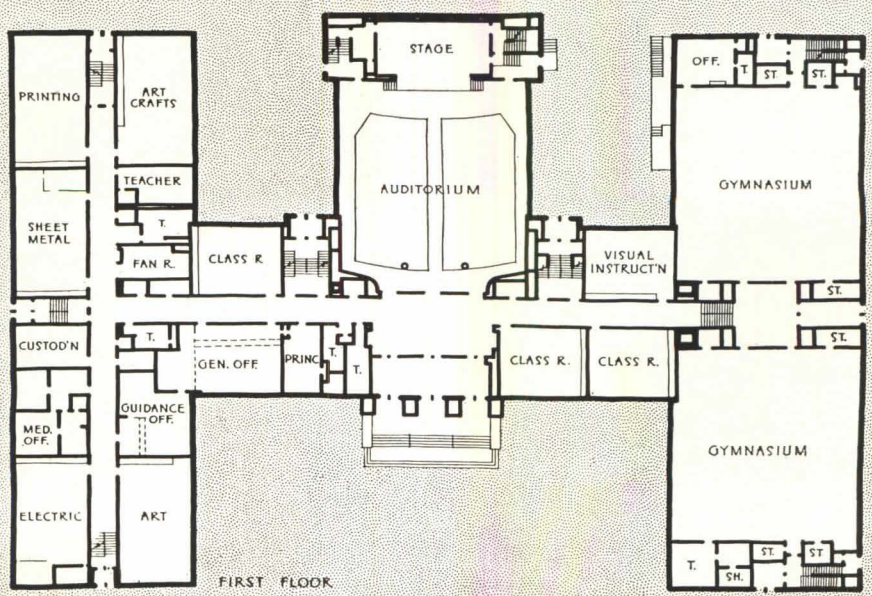
BOYS' JUNIOR HIGH SCHOOL

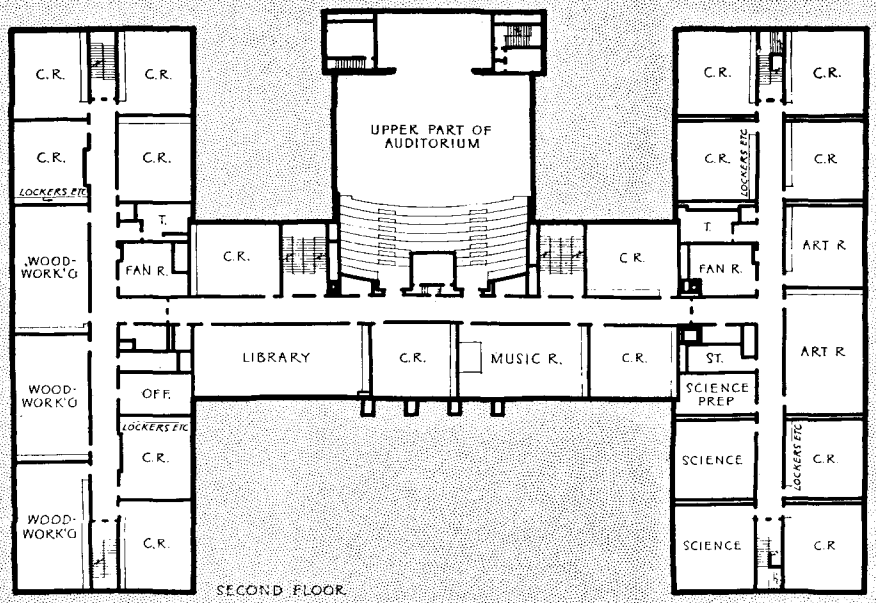
Public School No. 120, New York City

Eric Kebbon, Architect

The well established trend toward school activities going far beyond the Three R's is well evidenced in this junior high school for 3,000 boys. Besides two gymnasiums and a separate auditorium, the building provides shop rooms for: electrical work, sheet metal, printing, three woodworking shops, art craft, art weaving, signpainting, five science classrooms, three art rooms, two typewriting rooms. And, in addition to the usual complement of classrooms, there are special rooms for music, library, exhibit spaces, and so on.



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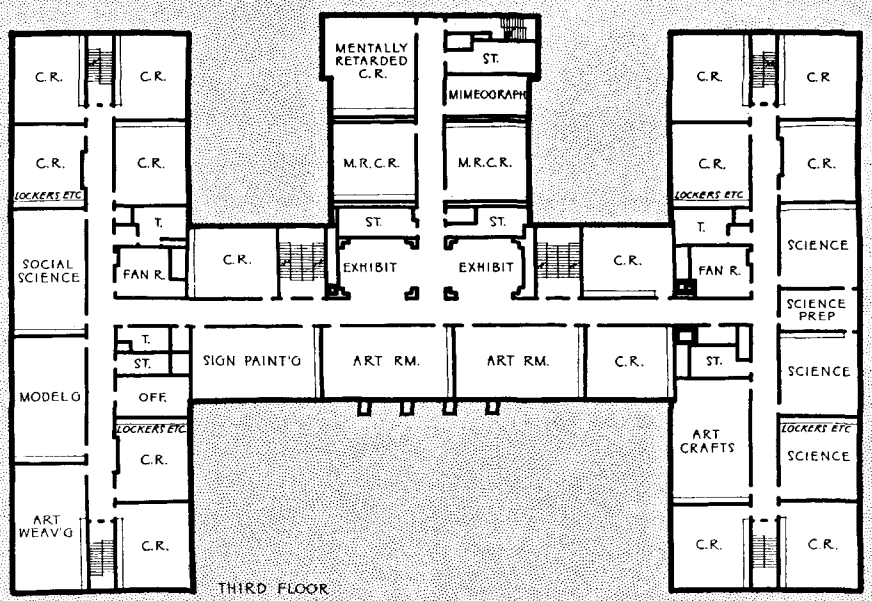
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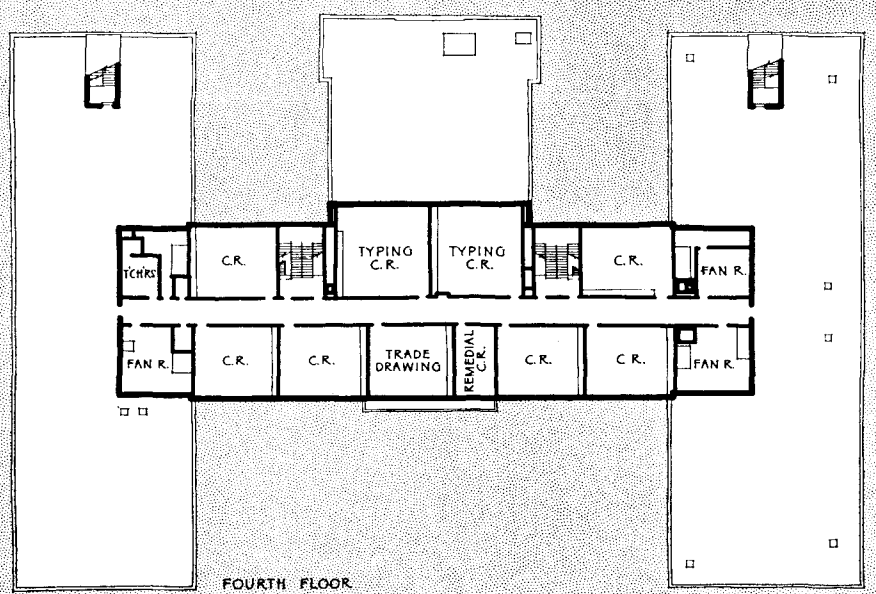
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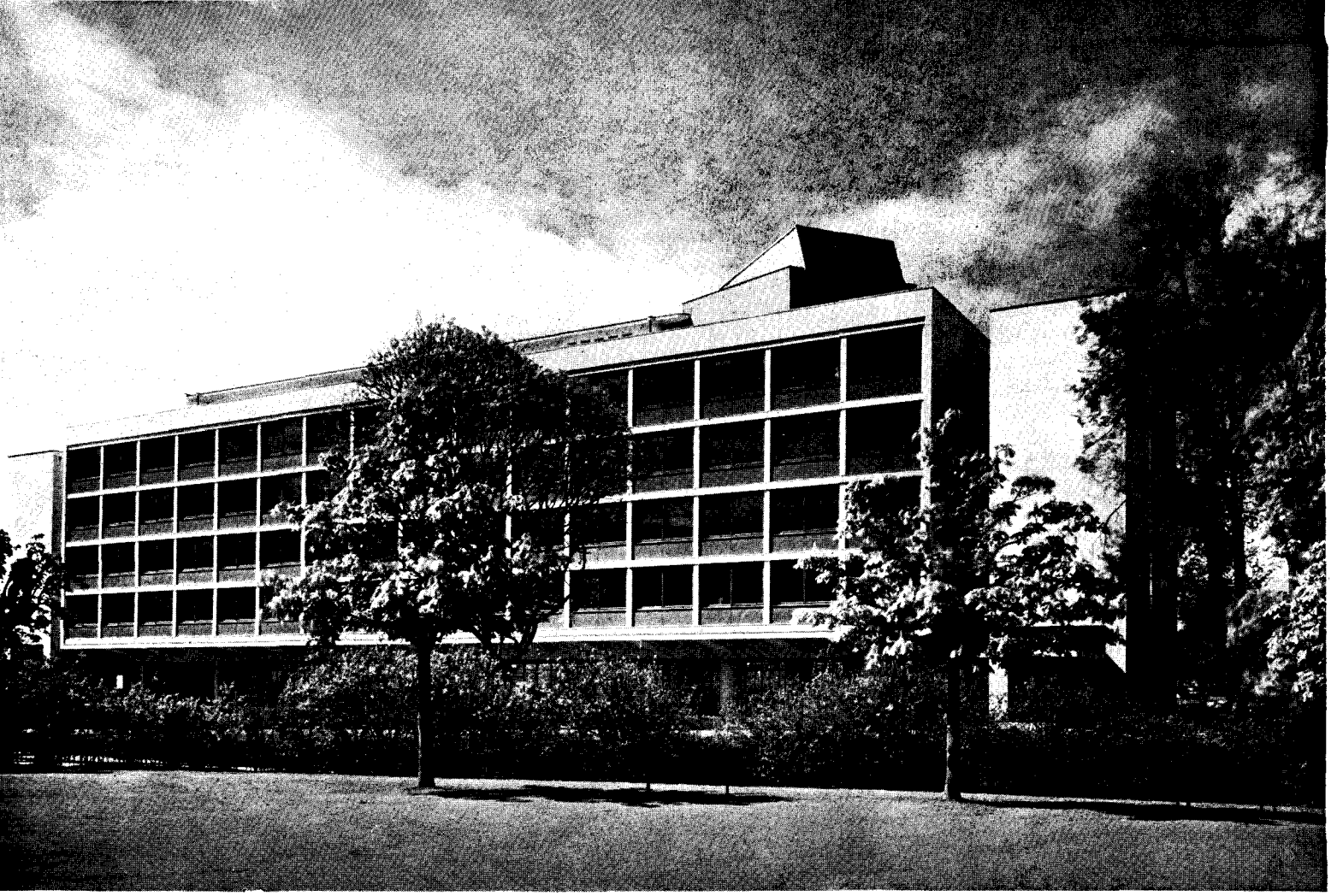


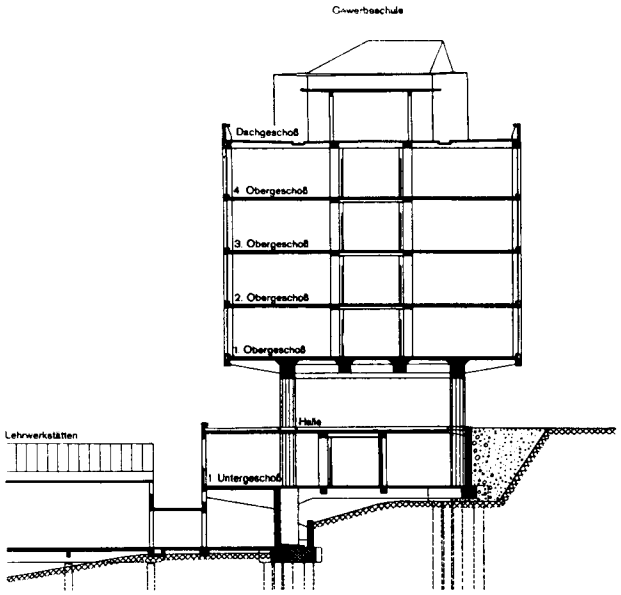
TRADE SCHOOL IN SWITZERLAND

Hans Brechbuhler, Architect

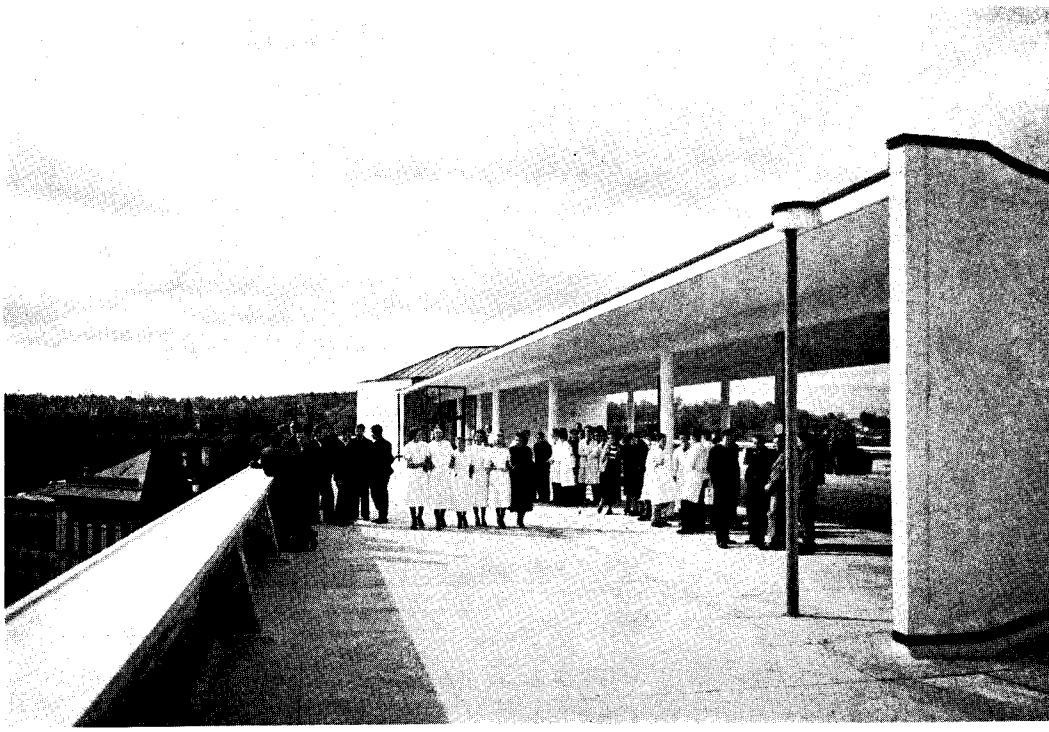
A PREWAR vocational school which exemplifies much of what American school designers will be seeking in post-war schools, is this one completed in 1940 in Berne, Switzerland. The vocational trend now evident in American school circles is here carried to an amazing degree. This school contains teaching facilities for trades and professions from auto mechanics to electrical engineers, from carpenters to dentists, hair dressers to scientists, butchers, gardeners, goldsmiths, steam fitters, and dozens of others. The learning-by-doing philosophy is well developed in this century-old institution, and is plainly evident in plans and facilities in the two new buildings here shown.

The concentration on vocational subjects is frankly and logically expressed in two different types of construction, without a single bow to any traditionalism that might hamper its development. Completely functional is the main building, with great window areas giving maximum daylight to classrooms, lecture halls, studios and laboratories. Just as functional is the second building, a single-level factory structure for heavy shop operations, also with maximum glass areas in monitors and sidewalls. The two contrasting buildings develop a difficult hillside plot, the taller one perched on the side of the slope, the other spread on level ground below.

Equally straightforward is the architectural development of the buildings. "Former buildings," says the architect, "boasted many intricate decorations and ornaments to provide the necessary beautification. But decoration of our technical and art rooms would clash with their purpose, being neither technical nor artistic." So he sought to express two motifs, the strength of the technical and the art of color and contrast. "Without decoration it is possible to create interest and beauty through contrasts of heavy and light, immobility and movement, light and dark."

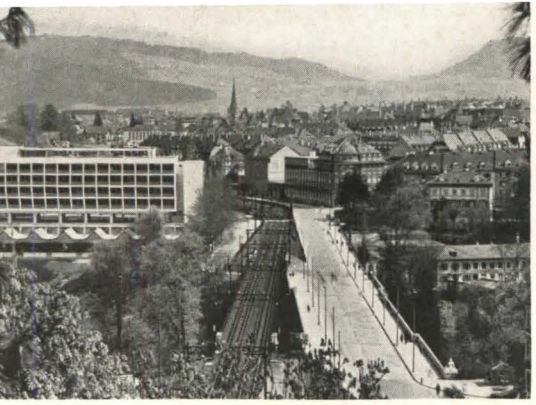


Above: the main section of the upper building, with its open fenestration, is solidly enclosed by two end sections. Functionally, these sections house entrances, stairs and elevators; and the separation shields the central classroom areas from noise and vibration

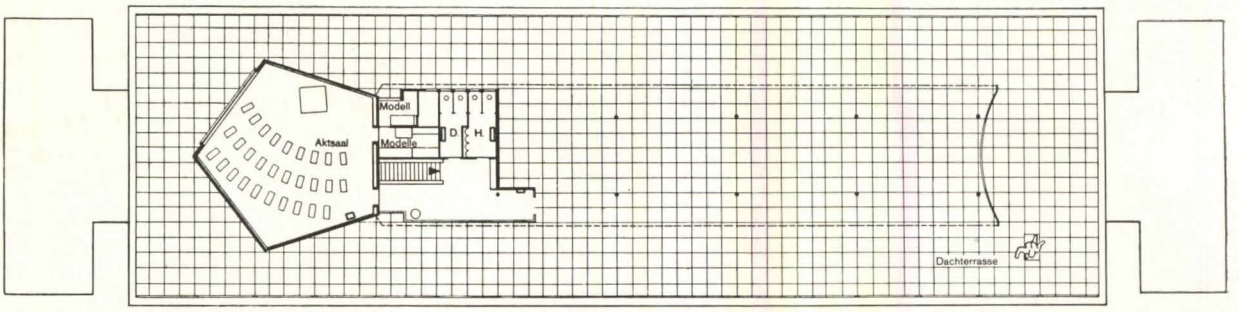


Extending from a penthouse art studio, a canopy develops roof area for a terrace, which serves not only as an attractive lounge space for students, but also as an outdoors studio for landscape enthusiasts, whether they are studying sketching, painting or photography

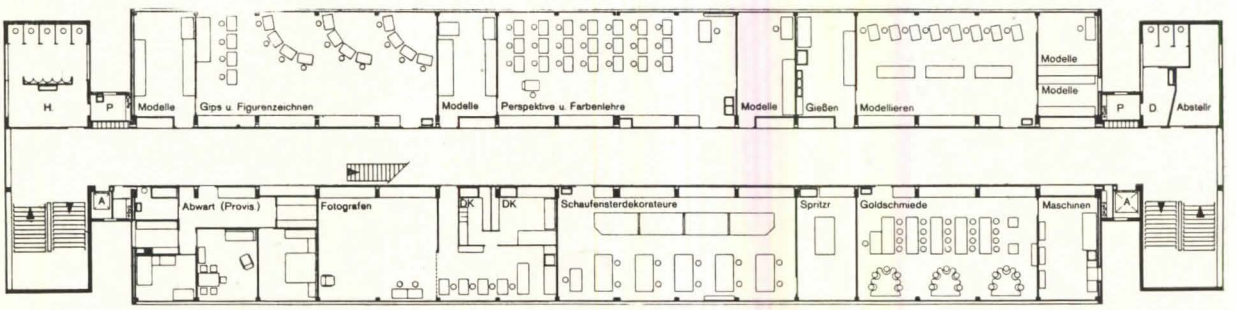
Definitely exotic is the device of hoisting the building up one story, literally on stilts. The architect uses it to enhance the separation of main school from shops building. He mentions also protection from noise and vibration, and utility as a lounge area for the students



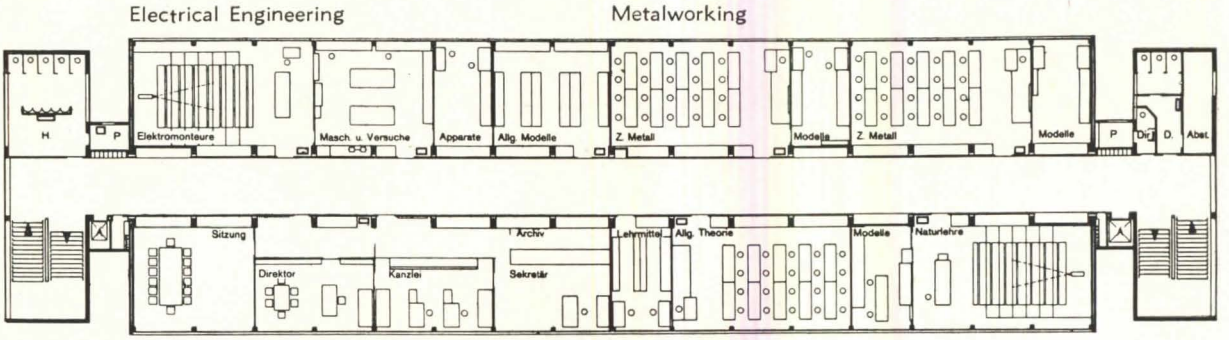
All heavy shop work of the vocational school is grouped in one open area in the lower building, a one-story structure at a considerably lower level. The main building with its shallow, well-lighted areas, houses the lecture and study rooms and laboratories. Plans below are ground floor, roof and two representative classroom floors of the main building. Conspicuously absent are "typical" classrooms; each space is laid out and furnished for its particular activity. The variety of activities for a single school is amazing—including shops for tailors, upholsterers, steam fitters, tinsmiths, goldsmiths, carpet makers, shoemakers, butchers, bakers, carpenters, hair dressers



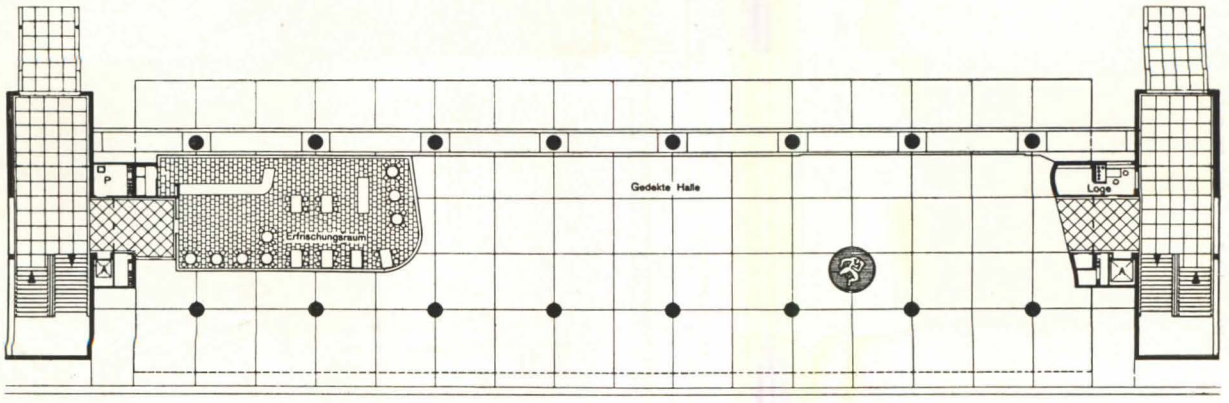
Art Studio Roof Terrace



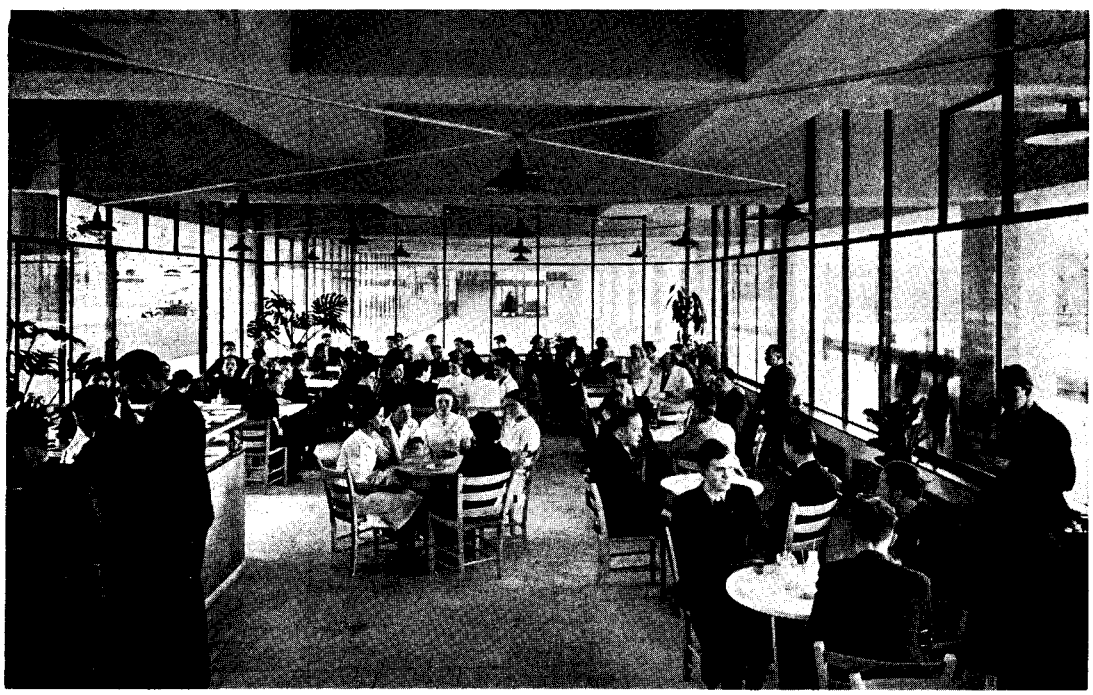
Living Quarters Photography Store Decoration Goldsmiths



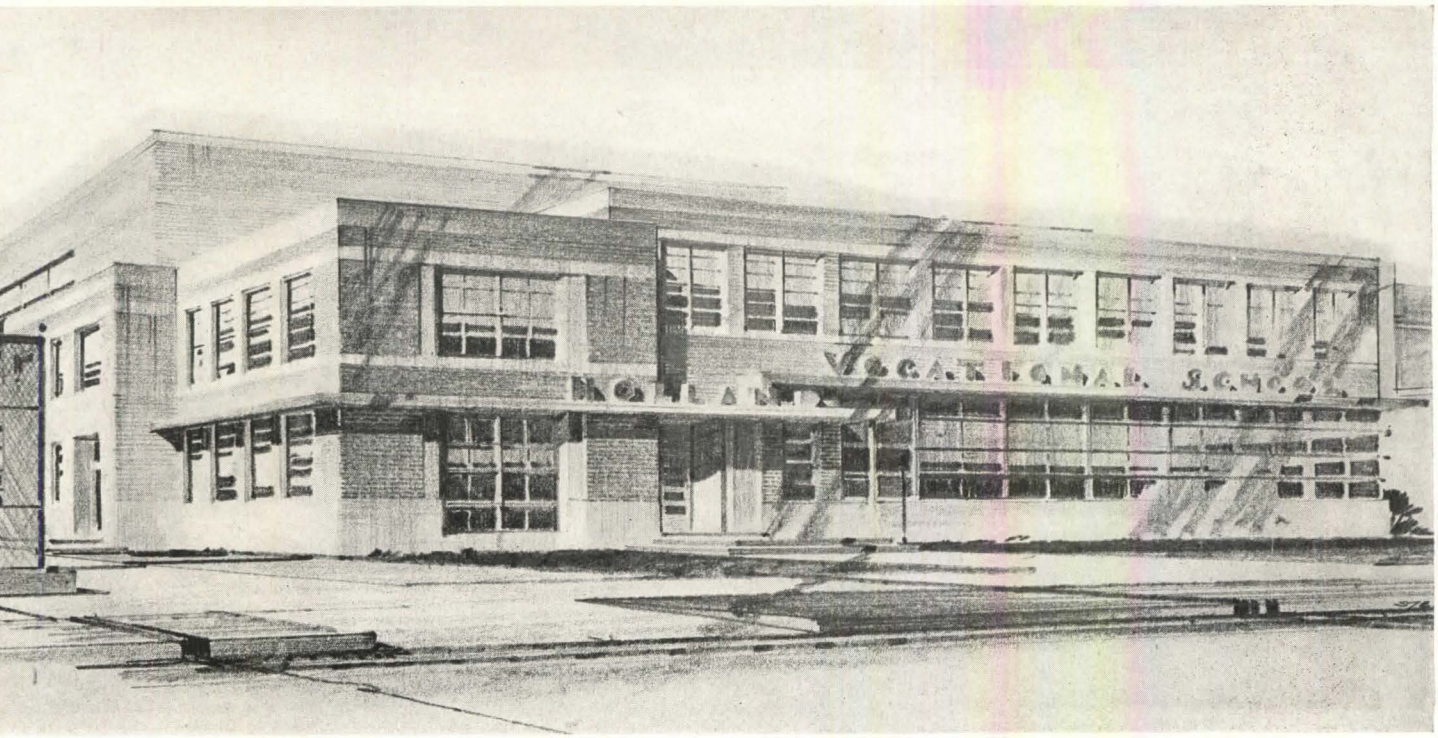
Offices Classroom Sciences



In most classrooms the natural contrasts of materials are depended upon for decorative effect. Concrete surfaces are frequently left unfinished except for painting. Wood desk tops are in natural finish; window frames painted white. Many lecture rooms are sound treated; and there is a layer of felt between ceiling and floor slabs, for sound insulation



Above: a students' cafeteria occupies one end of the otherwise open ground floor. Right: the shops building on the lower level is a one-story factory type structure, with light steel trusses spanning a large clear area. Skylights are double-glazed; the roof between monitor sections is of wood construction, with a layer of insulating material between the slabs

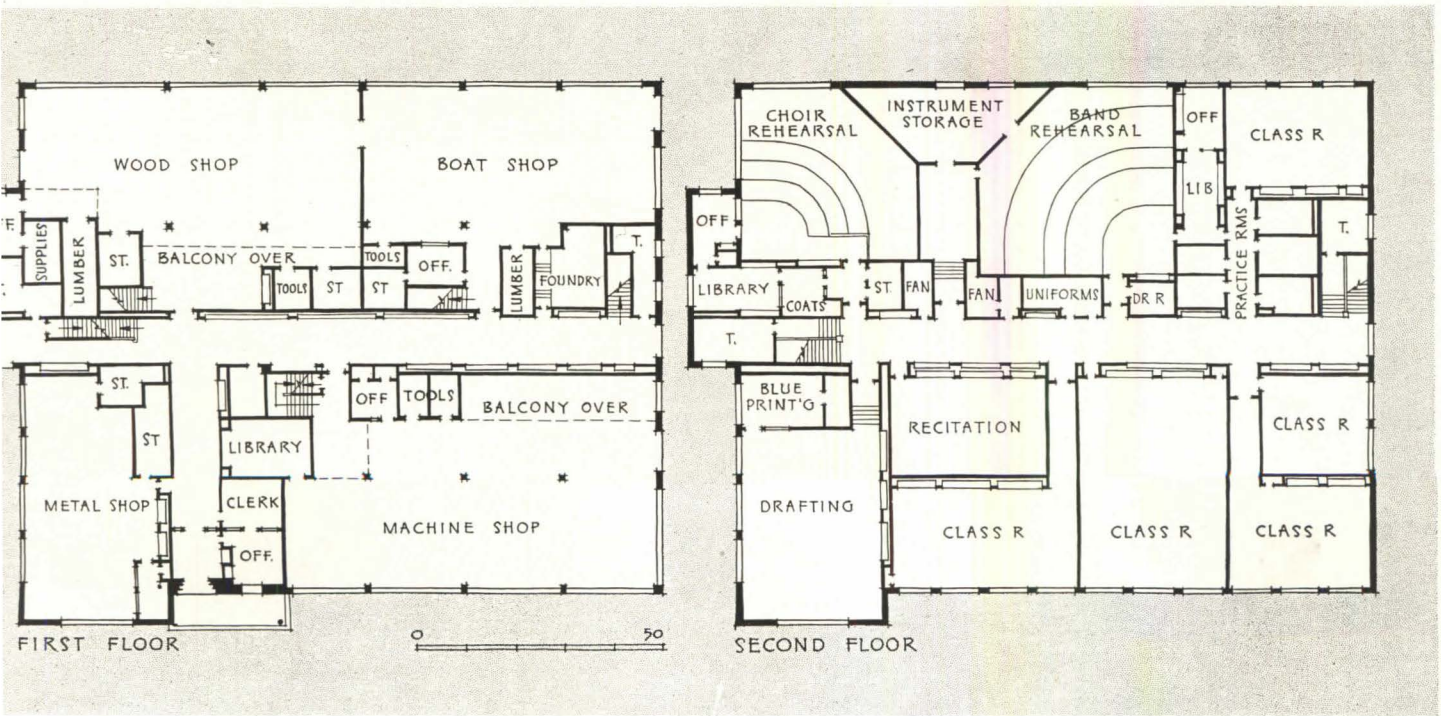


SMALL VOCATIONAL SCHOOL

Shop and Music Building, Holland, Mich.

Warren S. Holmes Company, Architects

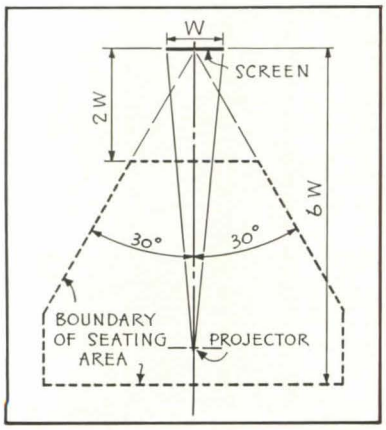
Planned for postwar construction, this vocational school building fills a need which the war has accentuated. The training of war workers overflowed the school shops and took over a gymnasium (photograph page 71). The combination of shops and music was dictated by needs of the community, needs of postgraduate as well as undergraduate students. The additional shop facilities which this building will provide are part of this city's program of broadening the practical training of students who do not go on to college.



MOTION PICTURE PROJECTION BOOTHS

From data supplied by the Society of Motion Picture Engineers*

ARCHITECTURAL RECORD
TIME-SAVER STANDARDS
FEBRUARY, 1943



NOTE – *LIMIT VIEWING ANGLE TO 30°.* TO DO THIS, NO ROW OF SEATS SHOULD BE LONGER THAN ITS DISTANCE FROM SCREEN

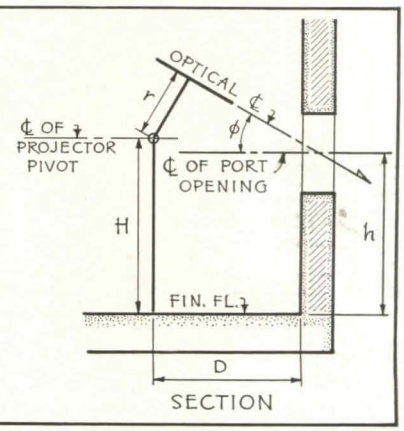
SEATING AREA WITH MATTE TYPE SCREEN

WITH 16MM. PREJECTOR IN SMALL ASSEMBLY ROOM

FORMULA: $h = H + rA - DB$

TABLE

ANGLE ϕ	A	B
0°	1.00	0.00
2	1.00	.04
4	1.00	.07
6	1.01	.11
8	1.01	.14
10	1.02	.18
12	1.02	.21
14	1.03	.25
16	1.04	.29
18	1.05	.33
20	1.06	.36
22	1.08	.40
24	1.09	.45
26	1.11	.49
28	1.13	.53
30	1.16	.58



H = HEIGHT OF PROJECTOR PIVOT
r = RADIAL DISTANCE OF OPTICAL CENTER LINE ABOVE PIVOT
D = DISTANCE OF PIVOT FROM WALL
ϕ = ANGLE OF PROJECTION
h = HEIGHT OF CENTER OF PORT

SELECT VALUES OF "A" AND "B" CORRESPONDING TO ANGLE OF PROJECTION AND SUBSTITUTE IN FORMULA

METHOD OF LOCATING PROJECTOR PORT

THE PROJECTION ROOM shall be of fire-resistant construction throughout and shall be supported by or hung from fire-resistant supports. The projection room shall have a minimum height of 8 ft.

The projection room proper shall be so located with respect to the screen that the vertical projection angle shall not exceed 14 degrees.

A type of floor construction recommended consists of (1) a reinforced concrete floor-slab not less than 4 in. thick, (2) a tamped cinder fill above the floor-slab not less than 4 in. thick, and (3) a troweled cement finish above the cinder fill, not less than 2 in. thick. Items (2) and (3) have been provided in order to accommodate concealed electric conduits, which should be installed prior to placing the fill and finish.

The projection room walls shall be built of brick, tile, or plaster blocks plastered on the inside with ¾-in. cement or acoustical plaster, or all concrete. The core of the wall shall be not less than 4 in. thick. Where plaster block is used, it shall be supported upon steel framework. All electrical conduits shall be in masonry chases in the wall construction so that they shall not project beyond the finished plaster line. In all cases, the inside surface of the front wall shall be smooth and without structural projections. The ceiling shall be constructed of 4-in. concrete slabs or precast concrete, or of 3-in. plaster blocks supported by a steel structure and plastered on the inside with ¾-in. cement plaster or acoustical plaster.

* *Second revision of standard projection room plans, published in Journal of the Society of Motion Picture Engineers, Sept., 1942.*

All electrical conduits in the ceiling shall be concealed.

A door shall be provided at each end of the projection room. Doors shall be not less than 2 ft. 6 in. wide and shall be 6 ft. 8 in. high. Doors shall be approved fire-doors of a type suitable for use in corridor and room partitions, shall be self-closing, swinging outwardly, and shall be kept closed at all times. It shall be possible at all times to open either door from the inside merely by pushing it. Door jams shall be made of steel.

Two portholes shall be provided for each projector, the "projection port" and "observation port."

All other ports, such as for spotlight, stereopticon, or floodlight machines, shall be as small as practicable and in no case shall exceed 7½ sq. ft. in area per machine.

It is recommended that an approved fireproof acoustical material be applied to the walls above a height of 4 ft. from the floor, and on the ceiling of the projection room.

Where the rewind room is adjacent to the auditorium, an observation port shall be provided through which the picture screen may be seen from within the rewind room. An observation window shall be provided between the projection room and the rewind room, consisting of a fixed fireproof frame and polished plate wire glass. This window shall be not more than 200 sq. in. in area, and shall have its horizontal centerline 5 ft. from the finished floor level.

Two exits shall be provided, one at each extreme end of the projection room, permitting direct and unobstructed egress.

All projection room lighting fixtures shall be equipped with keyless sockets and shall be controlled from wall switches.

The projection room proper shall have the following ventilating facilities: (a) Carbon arc exhaust, (b) Fresh air supply, (c) Projection room exhaust, including an emergency exhaust.

The carbon arc exhaust system shall be a positive mechanical exhaust system independent of all other ventilating systems of the theater. This exhaust system shall be operated by an exhaust fan or blower having a capacity of not less than 50 cu. ft. of air per minute for each arc lamp connected thereto.

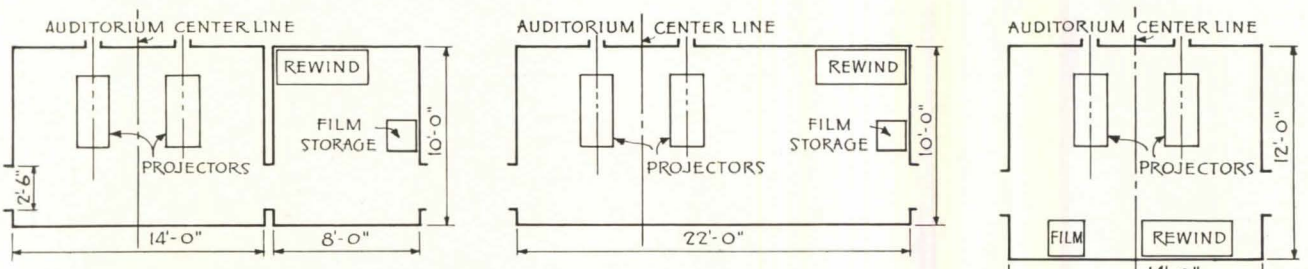
The fresh-air supply to the projection room shall consist of not less than two intake ducts located at or near the floor and at opposite ends of the room, and shall be connected into the main air-supply ducts of the building. There shall be no connection between this air-supply system and any of the exhaust system of the projection room.

The projection room exhaust system shall be a positive mechanical exhaust system having a normal capacity of not less than 200 cu. ft. per minute and having an auxiliary emergency capacity of not less than 1,000 cu. ft. per minute for operation in emergency, i. e., fire.

The general ventilation of the rewind room, i. e., fresh-air supply and room exhaust, shall be a part of the projection room fresh-air supply system and the projection room exhaust system. There shall be no connection between the projection arc exhaust system and any part of the rewind room ventilating system.

ARCHITECTURAL RECORD
TIME-SAVER STANDARDS
FEBRUARY, 1943

MOTION PICTURE PROJECTION BOOTHS

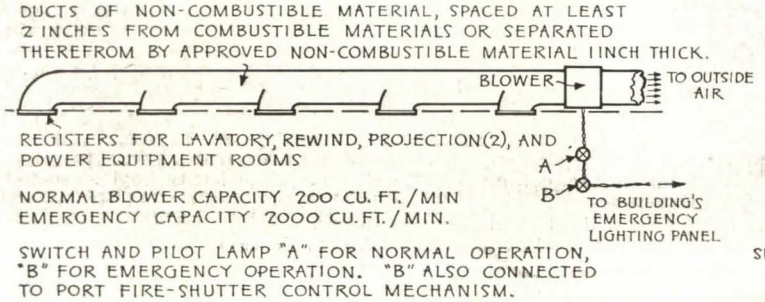


WITH SEPARATE ROOM FOR REWIND AND FILM STORAGE

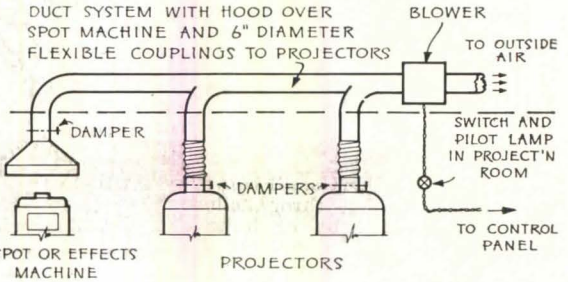
WITH REWIND AND FILM STORAGE AT END OF ROOM

WITH REWIND AND FILM STORAGE BEHIND PROJECTORS

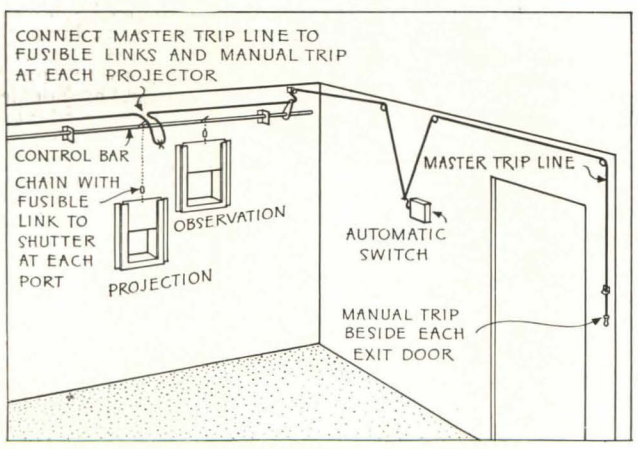
PROJECTION ROOM LAYOUTS



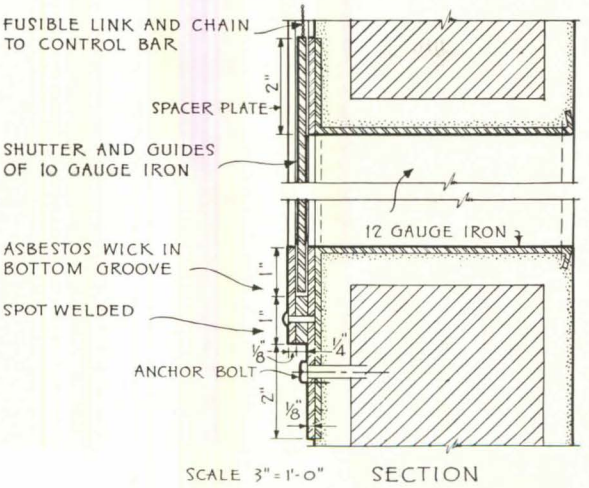
GENERAL AND EMERGENCY VENTILATION SYSTEM



• EQUIPMENT • VENTILATION SYSTEM



SHUTTER RELEASE SYSTEM



SHUTTER CONSTRUCTION

Looking ahead with Asbestos

"It's Tops!"

SAY HOME-OWNERS OF K&M-SHINGLED ROOFS

● Sure it's tops! For a roof made with Keasbey & Mattison "Century" asbestos-cement shingles is all set for life. Its owner will have to find something else to worry about.

Yes, tops is right! For these shingles bring to roofs not just long life, but a long life of beauty, charm, individuality. The architects of Tomorrow's homes will find in these colorful shingles wide scope for their artistic sense. They'll find practicality, too; for behind the subtle beauty of "Century" shingles is a sturdiness that holds rot, weather, termites and fire at bay.

Recently, the heavy wartime demand for Keasbey & Mattison's "Century" Asbestos Shingles, as well as its flat sheathings such as Apac Board and Linabestos, has relaxed to some extent. As a result, a larger percentage of these "Century" asbestos building products are now becoming available for general use.

Research continues without interruption in the K&M laboratories, intent on finding for Nature's strangest mineral an ever-widening range of service to the world.

* * *

Nature made asbestos;
Keasbey & Mattison, America's asbestos pioneer,
has made it serve mankind . . . since 1873

KEASBEY & MATTISON

COMPANY, AMBLER, PENNSYLVANIA

Makers of

asbestos-cement shingles and wallboards; asbestos and magnesia insulations for pipes, boilers, furnaces; asbestos textiles; asbestos electrical materials; asbestos paper and millboard; asbestos marine insulations; asbestos acoustical material; asbestos packings; asbestos corrugated sheathing and flat lumbers; asbestos-cement pipe for water mains

Figure 1

BUILDING PROBLEM

CONFRONTED by the problem of erecting a new laboratory around an existing building without interrupting essential war research, and doing it with the fewest possible materials, the construction department of Westinghouse Electric & Manufacturing Company resorted to a new type of European structure known as Diagrid.

Instead of the usual truss or bridge type supporting members for the roof, a grid of small I-shaped beams and bars was used. This grid slopes from the center to the walls at a slight pitch. The walls were built, the diagrid roof framing was erected and closed in with poured gypsum roof slab, without any stoppage of heat, light, or other services to the old building. After the outer building was completed, the inner one was removed section by section, without interference to the work in progress.

The new structure is about 270 ft. long, with a clear span of roughly 85 ft. There are no supporting columns to interfere with work operation, and because the usual trusses were eliminated, 6 ft. of building height was saved. The steel saving amounted to approximately 70 tons. (See Figure 1)

SELF-RAISING WOODEN SEAT

A NEW LINE of wooden closet seats combines the advantages of a self-raising hinge with the conventional type seat. The core is made from selected straight grain Northern Hardwood, said to eliminate warpage and other common defects. All seats are made from 1¼ in. stock and are available in standard finishes, as well as sheet covered. The spring mechanism which pulls the seat erect to a 90° angle is enclosed in a bakelite housing with a white plastic cap, and thus is protected against dirt, bacteria and moisture. A flexible check mechanism allows the erected seat to be forced back beyond the perpendicular until it contacts the wall or other obstruction, immediately returning to the vertical position without damage. Sperzel Sanitary Seat Company, 218-230 Metropolitan Life Building, Minneapolis, Minn.

AWNING-TYPE WINDOW

DESIGNED for barracks, housing projects, war plants, temporary schools, etc., a new low-cost line of Pella "Awning-Type" windows can be used with standard 2 by 4 frame or thin wall construction. As the windows are set right into the studding, no frames, sash weights or balances are required. No fitting is necessary on the job, and the windows come completely assembled except for the lock handle. Sash units are of white pine and toxic treated with Woodlife. There are 14 standard fixed and ventilating units. The latter can be side-hinged for out-projecting casement style adaption. "In" or "out" opening arrangement can be specified. Frame screens are also available. (See Figure 2.) The Rolscreen Company, Pella, Iowa.

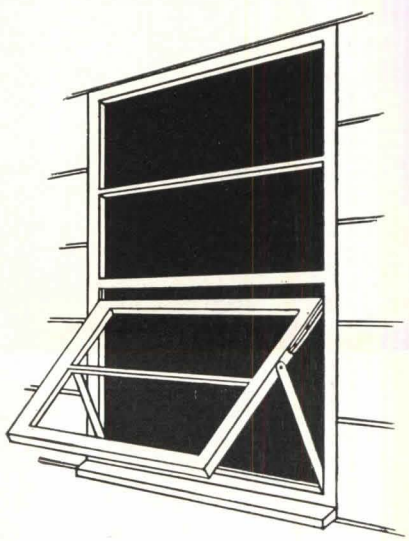


Figure 2

PLASTER INTERCEPTOR

A WARTIME MODEL of the Zurn Plaster Interceptor, formerly made entirely of metal, employs vitreous china for the body and the removable sediment container. Designed to intercept and collect bits of metal, plaster, glass and other solids and so prevent clogging of drainage lines in hospitals, dental offices and laboratories, industrial plants and similar buildings, this unit can be installed under the sink or fixture it is to serve. It can be placed on a shelf, set on or in the floor. No "S" trap is required when the Interceptor is used, for the unit itself functions as a self-sealing trap. (See Figure 3.) J. A. Zurn Mfg. Company, Erie, Pa.

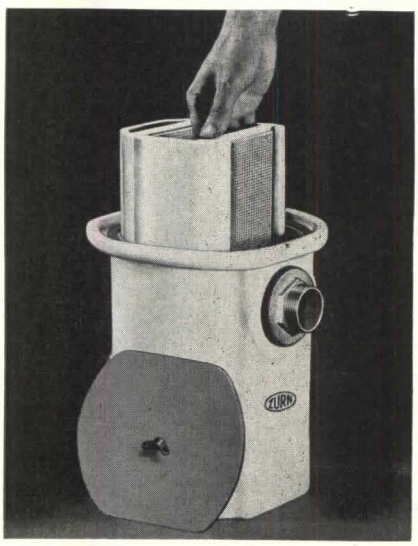
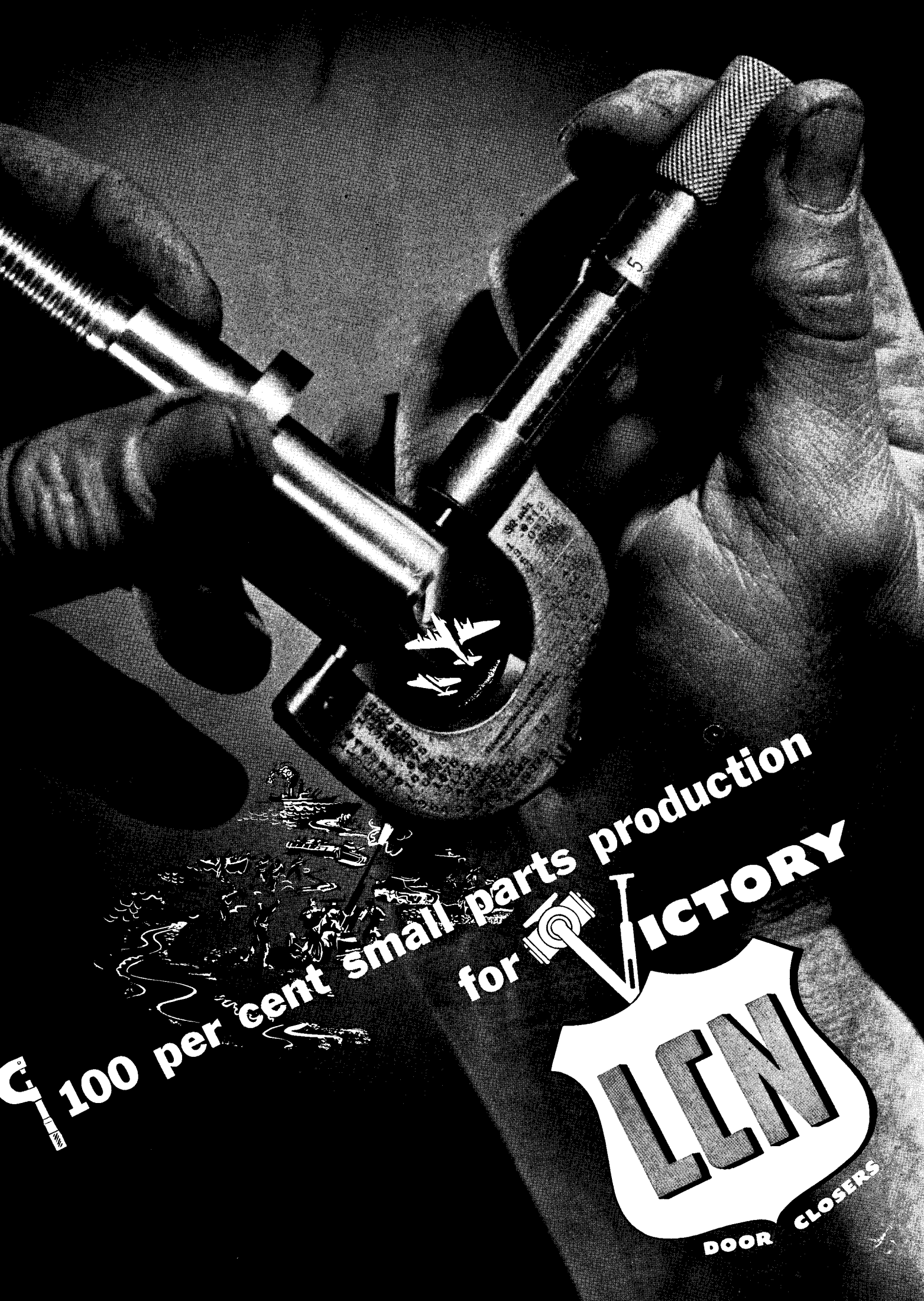


Figure 3

NEW GYPSUM PRODUCTS

A GROUP of new gypsum products developed to meet the immediate demands of wartime construction has just been put on the market by The Celotex Corp., Chicago. The products include a gypsum exterior siding covered either with smooth or mineral surfaced roofing; laminated gypsum wallboard panels suitable for demountable or permanent single wall interior partitions; laminated gypsum roof deck slabs; and poured gypsum roof decks for use with wood frame industrial construction. The Celotex Corporation, 120 S. La Salle St., Chicago.

(continued on page 88)


100 per cent small parts production
for VICTORY
LCN
DOOR CLOSERS

(continued from page 86)

GYPSUM BOARD

AN IMPROVED gypsum board, Triple-Sealed Sheetrock Siding, is claimed to cut the cost of duration buildings up to 30 per cent, and to build, sheathe, side, brace and decorate in one operation. Made of gypsum, the board is both fireproof and weatherproof. In addition to the "triple-seal" (a new process for sealing edges, ends and surfaces), a "drip cap" shiplap edge has been developed to protect joints between boards from the weather. The new board is designed especially for duration buildings. It has a camouflage green exterior surface for exposure to the weather, and a manila inner surface to make a pleasing interior finish without decoration. United States Gypsum Company, 300 W. Adams Street, Chicago.

STEEL SCAFFOLDING

A NEW SYSTEM of portable steel scaffolding called Safway replaces the "wooden horses and planks" method. The basic unit consists of two end frames which, when erected, are held rigidly together by two cross braces. This forms a complete unit 5 ft. wide, 7 ft. long and 5 ft. high. Desired heights are obtained by adding similar units to the basic unit through the use of coupling pins. Additional lengths are made by adding frames and fastening them together with cross braces.

Safway Steel Scaffolding is designed for use in new construction and maintenance work on office buildings, schools, churches, theatres, stage sets, bleachers, etc. Accessories include ladders, hoists, ramps, steel rolling and material handling towers. Safway Steel Products, Inc., 6228 W. State Street, Milwaukee, Wis.

PROTECTIVE PAINT

AN ANTI-CORROSION and heat resisting industrial paint called Proctectite now on the market embodies a hard calcined carbon-silicate complex pigment. Exclusive with the manufacturer, this pigment is said to provide a dense pliable and waterproof coating free from pin holes, to be resistant to corrosive atmospheres, acids and alkalies, and able to withstand temperatures developed in modern power plant equipment. It is furnished ready for use in black and battleship grey, for general maintenance, protection of machinery and equipment, on hot materials such as stacks, boilers, pipes, etc., and floor coating. J. Merrill Richards, 25 Huntington Ave., Boston, Mass.

VARIABLE DISCHARGE HEATER

AN ADDITION of a new variable discharge heater to a line of revolving unit heaters is announced. Provision for adjusting the amount of heated air discharged from any side of the heater is incorporated in the discharge outlet, making possible the heating of a long narrow room or building with one revolving unit heater, the air streams being reduced and extended as the discharge outlets cover the sides and ends. L. J. Wing Mfg. Co., 160 W. 14th St., New York City.

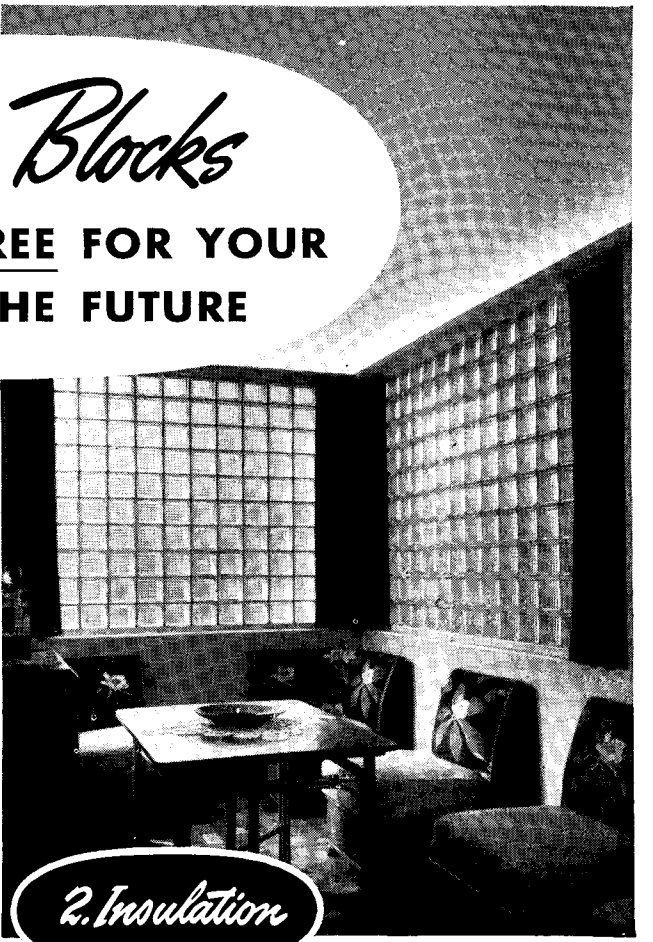
(continued on page 90)

PC Glass Blocks

PROVIDE ALL THREE FOR YOUR DESIGNS OF THE FUTURE

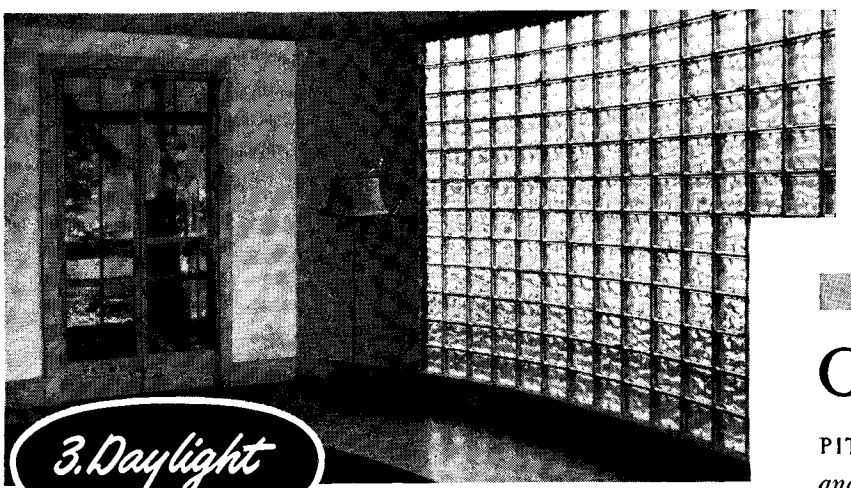
1. Beauty

There's something striking about a panel of PC Glass Blocks—a clean, modern look that immediately stamps a home as efficient and up-to-date. Night and day, they decorate the home—both inside and out. They fit suitably into any type of architecture. And a panel of PC Glass Blocks forms an excellent background that blends in a most pleasing way with any colors or scheme of decoration that you might choose. PC Glass Blocks are a truly modern material that provides the "extra something" that pleases prospects and helps get their business.



2. Insulation

It's not that PC Glass Blocks transmit more daylight than ordinary windows—*but* you will find that you frequently can use them in larger areas than is practical with standard windows. For example—their lack of transparency makes them ideal where you want a lot of light, but wish to shut off an unattractive view. You can provide plenty of light and still guard privacy in dressing rooms or bathrooms. Rooms can be made cheerful with entire walls of light-transmitting glass when glass blocks are used, without danger of occupants feeling that they are living in a "show window."



3. Daylight

Home owners want good insulation—and they can have it in light-transmitting areas, too. For PC Glass Blocks provide good insulation—a "U" value of 0.49, which is double the insulation value of single-glazed windows. This means lower heating costs—especially when large light-transmitting areas are included in your design. It means more comfort—in such places as breakfast rooms where people sit close to the outside walls—in bathrooms where cold from single-glazed windows might be annoying. And the better insulation provided by PC Glass Blocks means less condensation—an important factor now that air is humidified in so many modern heating plants.

PITTSBURGH PC CORNING

GLASS BLOCKS

Distributed by
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and by W. P. Fuller & Co. on the Pacific Coast

"PITTSBURGH" stands for Quality Glass

PITTSBURGH CORNING CORPORATION
632 DUQUESNE WAY—PITTSBURGH, PA.

(continued from page 88)

FLUORESCENT LIGHTING

A RECENT DEVELOPMENT in fluorescent lighting provides illumination to full intensity without flicker or delay the instant the switch is turned on. In one new unit, Insta-Lite, ballast and starting switch functions are combined, and no additional starters are required. Insta-Lite is said to greatly reduce maintenance cost, since starters are responsible for about 85 per cent of the servicing required by fluorescent lights. Lower power loss, minimized stroboscopic effect, and lighting performance stabilized at level of maximum lumen output are other advantages claimed for the unit. Made for two 40-watt tubes, for 110-125 Volt AC, Insta-Lite is offered in fixtures for industrial and commercial installation. Meeting Bureau of Standard specifications for fluorescent reflectors, and the Insta-Lite principle is approved by the Underwriters' Laboratory, Inc. Insta-Lite is available in fixtures with non-metallic reflector, conforming to the WPB Limitation Order L78. The Spero Electric Corporation, 18220 Lanken Avenue, Cleveland, Ohio.

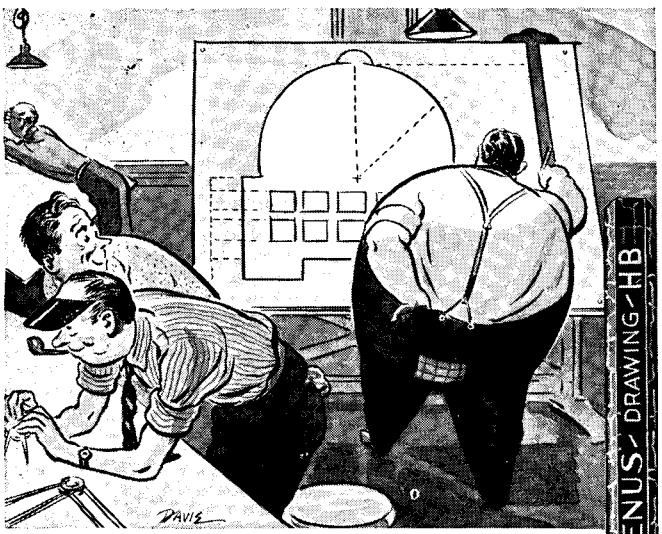
ANOTHER UNIT, the Quick-Liter, also features instant starting and low power losses. This is a super-powered unit for two 40 and two 100-watt standard fluorescent lamps. An additional feature is the protection afforded by "Bump-Proof Socket Plates" to the plastic lamp-holders. Quick-Liter can be mounted singly or in continuous runs. Edwin F. Guth Company, 2615 Washington Boulevard, St. Louis, Mo.

PREFABRICATED GLASS SHOWER STALL

RECENTLY INTRODUCED is a prefabricated glass shower enclosure, packed as a unit in one box containing all materials and screws necessary for installation. Also included are a recessed white china soap and grab, and a natural-finish wood shower curtain rod. The glass is fabricated with holes for plumbing outlets, drilled to specifications submitted with the order. A maximum of five or a minimum of three pieces of glass form the complete unit. Pittsburgh Plate Glass Company, 2029 Grant Building, Pittsburgh, Penna.

HEATER AND VENTILATOR

DESIGNED ESPECIALLY for use in war production plants is a unit called the Vertivent, offering controlled ventilation and air tempering. This unit takes fresh air from the outdoors, draws it through dual heating coils and distributes it uniformly. It consists of a ventilator type air intake section mounted on the roof, and an air tempering section with coils, fan and power unit enclosed in a housing suspended in the building. It is designed to meet all wartime requirements. The hood covering the air intake prevents light leaks during blackouts and keeps out the weather. Young Radiator Company, Racine, Wis.



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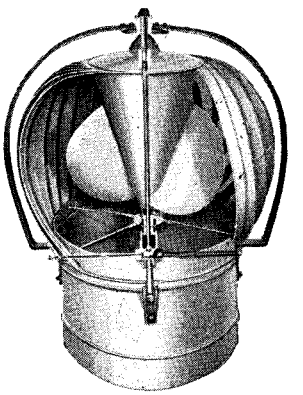
3 TYPES OF ALLEN Turbine Ventilators for 3 Important Jobs!

1. Coni-Vane. The famous "Free Air" Allen Ventilator which gives cost-free powerful suction, and is the standard installation for most ventilating jobs.

2. Electro-Wind. Air plus power. The same Coni-Vane ventilator, with auxiliary electric power available to double the exhaust at a tip of the switch.

3. Type "C". The vane-less Allen, especially designed for chimney jobs or any ventilation project where lowest cost is demanded.

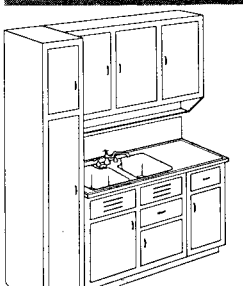


Illustrated—Coni-Vane

Better ventilation means higher war production! Our engineering department will assist you if desired. Let us send the latest literature for your files, on these 3 types of Turbine Ventilators, and also the many other types of Allen Ventilating equipment for varied industrial uses.

The ALLEN Corporation
9761 ERWIN AVENUE DETROIT, MICH.

33,000 KITCHENS MUST BE RIGHT!



AMERICA'S LEADING BUILDER OF WAR-TIME CABINETRY

★ As its contribution to war and defense housing, Kitchen Maid has already sold more than 33,000 kitchens for projects of all types! Such a record is further evidence that this famous factory-built cabinetry of *composite construction* is *right* for practically every application—proof that it meets the most rigid present-day requirements for adaptability, ease of installation, price, and delivery. But more than that! Kitchen Maid's wide experience in this advanced cabinetry design can be of great value to you on any war housing job. Write for facts now.

Kitchen Maid Corp., 632 Snowden St., Andrews, Ind.

KITCHEN MAID
CABINETRY OF COMPOSITE CONSTRUCTION

PLAN THE "HEALTH ZONE" CAREFULLY

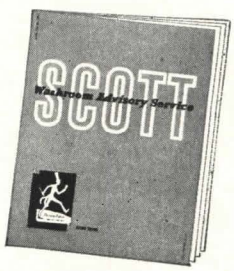
...it can keep workers on the job

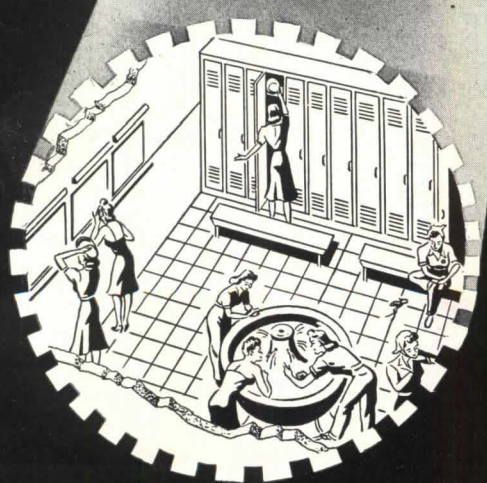
TWENTY-FOUR hour production schedules can't wait for absent workers. And employers know that a great deal of lost time, due to minor illnesses, can be prevented by making working conditions as sanitary as possible.

For that reason your industrial clients are paying more attention to washrooms than ever before. Records show that clean, up-to-date washrooms, equipped with plenty of soap, hot water and individual tissue towels, can substantially reduce the spread of common contagious diseases.

Such washrooms are an important part of any industrial health program. They are literally "health zones." They should be planned as an essential part of every manufacturing plant you design. Ample facilities should be provided, in convenient locations, and all fixtures should be placed to insure most efficient use and a smooth flow of traffic.

The Scott Paper Company can aid you in designing washrooms that help keep workers on the job. The latest Scott Washroom Advisory Service Manual gives basic washroom layouts that have proved practical in all types of industrial buildings. For your copy, and a set of Don Graf Data Sheets on washroom plannings, write Scott Paper Co., Chester, Pa.





SCOTT WASHROOM ADVISORY SERVICE

Official U. S. Navy Photo

U. S. NAVY'S Seabees learn REFRIGERATION

THE official U. S. Navy photo above shows a refrigeration class at the Naval Construction Training Center near Norfolk, Virginia. Training of refrigeration specialists is greatly facilitated by the visual demonstrator of the refrigeration cycle.

The Seabees shown are following the instructions of Chief Shipfitter W. A. Edwards, who is pointing to the "mock-up" of the Carrier circuit. All men selected from Seabee battalions for special training in operation and maintenance of refrigeration equipment have been previously enlisted and rated on the basis of their civilian experience in the mechanical refrigeration field.

Carrier refrigeration and air conditioning first went to war in World War I. Today, the control of air temperature, humidity and circulation of cleaned air is provided by Carrier equipment and technique for Army camps, Navy bases and war production.

Users of Carrier equipment will find their nearby Carrier Branch Office or distributor ready to cooperate in every way to help keep present equipment operating efficiently and economically for the duration. Mail the coupon for a copy of the helpful booklet: "Civilian Conservation of the B.T.U."

CARRIER CORPORATION, SYRACUSE, NEW YORK

CARRIER CORPORATION
Syracuse, N. Y.

Please send copy of booklet "Civilian Conservation of the B.T.U.," telling how to keep air conditioning and refrigeration equipment operating for the duration.

Name .....

Company .....

Address ..... City .....

This most coveted honor, the Army-Navy "E", was awarded to Carrier Corporation for continued excellence in war production.

Carrier

AIR CONDITIONING
REFRIGERATION

Putting "WINGS" on Production

. with REVOLVING Unit Heaters .

Wing Revolving Unit Heaters in modern defense plant. Note congested areas that would obstruct heat from fixed discharge heaters.

The proper heating of industrial plants has a definite bearing on production output. That is why you should investigate WING *Revolving* Unit Heaters. Because the discharge outlets slowly revolve, Wing heaters gently circulate the warm air around bulky machinery and other obstacles and into otherwise cold corners, assuring a comfortable temperature at every part of the working level. The gentle movement of the air brings a sensation of fresh, live, invigorating warmth to workers. It tends to speed their efforts and at the same time make them more accurate in their work.

Many plant engineers, who have used this exclusive new type of heat circulation for years, attribute their satisfaction with Wing Revolving Unit Heaters to these advantages—

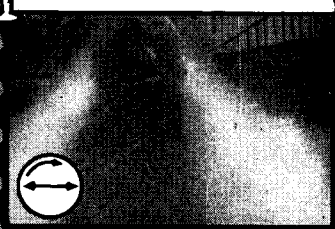
1. The moving streams of heated air sweep slowly around a complete circle, reaching walls and remote corners and around obstructions.
2. No individual worker or group of workers can be subjected to the continuous, energy sapping blasts of hot air that result from fixed-position discharge outlets.

The result of all this is higher heating efficiency and maximum worker comfort — important always, but especially important now, when ideal working conditions mean so much in speeding War production.

Write for a copy of Bulletin HR-1, the complete story of the problem of heating modern industrial plants.

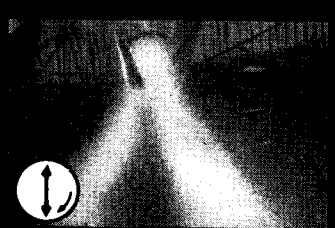
L. J. WING MFG. CO., 151 W. 14th Street, New York, N. Y.

Smoke Test shown below demonstrates coverage of Wing REVOLVING Heater.



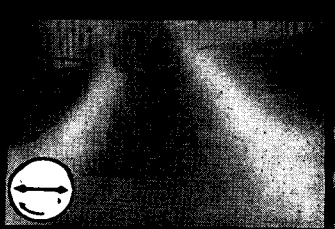
1 *Start. Smoke from bomb at top of heater is drawn through heating element and is discharged in slowly moving streams to the working level.*

2 *Note how the streams of heated air flow gently even to remote corners of the room and around obstructions.*



3 *The discharge outlets have slowly revolved through 180°, building up a blanket of uniformly warmed air.*

4 *Still turning through 270° the streams of heated air are covering every part of the working level.*



5 *The discharge outlets have completed one revolution, demonstrating conclusively the thorough coverage of the WING Revolving Heater.*

WING *Revolving* UNIT HEATERS

SAFE WAYS IN WAR PRODUCTION

NEW WORKER—Every new employee in a Bethlehem Plant wears this button. It helps to fix his attention on safety. It signals to more experienced employees that he is new to the plant, and they keep an eye on him, and do not hesitate to offer friendly guidance in case he forgets instructions and unknowingly breaks any safety regulation.

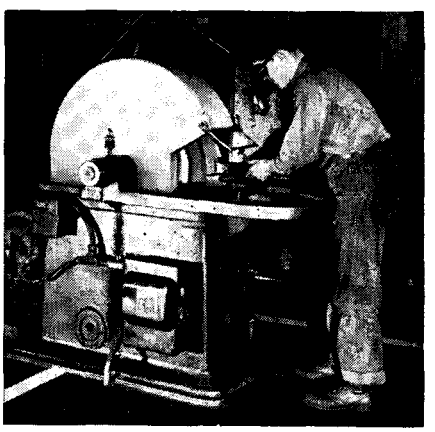
Industrial accidents, bad enough because of the human distress they cause, are also a grievous drag on production. Every day that injury lays up a worker means lowered output of the materials our armed forces are asking for.

Safety engineers know they must be more than ever on guard as pressure for production intensifies and men work against time. When war came, Bethlehem Steel Company expanded its accident-prevention program to meet the new conditions. Special efforts were addressed to the new employee to make him safety-conscious from the moment he walked into the plant. And by posters, group meetings and individual instruction, the safe way of doing his job was ground into the subconscious of new Bethlehem employee and veteran alike.

Significant are the results of a current study, showing that of all disabling accidents to Bethlehem employees less than one-third occur in the course of their work. Even with employment rolls upped by the tens of thousands and plant operations at top speed to meet the demands of the war program, the Bethlehem employee is safest, best protected against injury, during the hours he spends on the job.

AUTOMATIC HAND GUARD—This man is operating a trimming press. If he should absent-mindedly let his hands move too near the danger zone, the two cables will automatically whisk them back to safety, before the ram of the press descends.

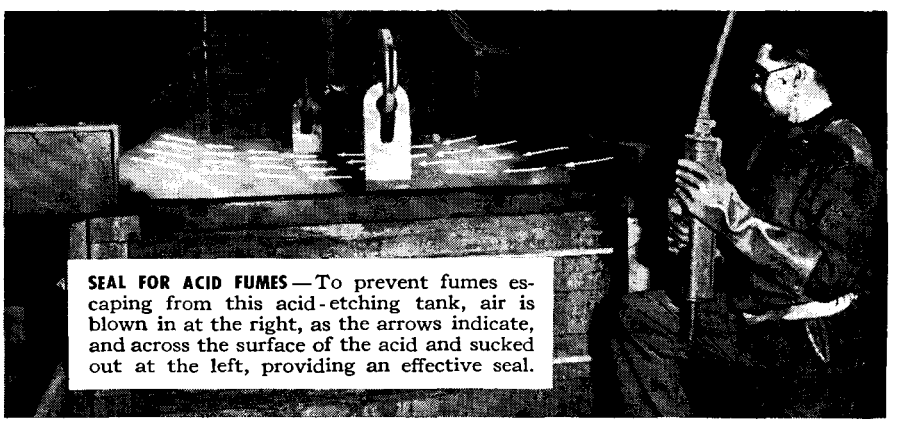
100% HEAT-INSULATED—Asbestos-covered hood, chrome-leather full-length apron, chrome-leather gloves, chrome-leather full-length sleeves and asbestos guard on torch handle give this worker complete protection against heat and flying sparks.



EYES DOUBLY GUARDED—Even though this grinder is equipped with a heavy glass shield, the eyes of the man who is operating it are given further protection against sparks or flying bits of abrasive by the cup goggles that he is wearing.

BETHLEHEM STEEL

Bethlehem Steel Company is actively supporting the National Safety Council in its campaign against accidents in war production, through the War Production Fund to Conserve Manpower.



SEAL FOR ACID FUMES—To prevent fumes escaping from this acid-etching tank, air is blown in at the right, as the arrows indicate, and across the surface of the acid and sucked out at the left, providing an effective seal.

GRAND RAPIDS HARDWARE COMPANY *REPORTS FOR DUTY!*

The manufacturing facilities of the Grand Rapids Hardware Company are now largely devoted to the production of vital war material.

The precision work which characterized Grand Rapids peace time products now enters, under strict specifications, the metal products which are being shipped overseas in ever increasing volume.

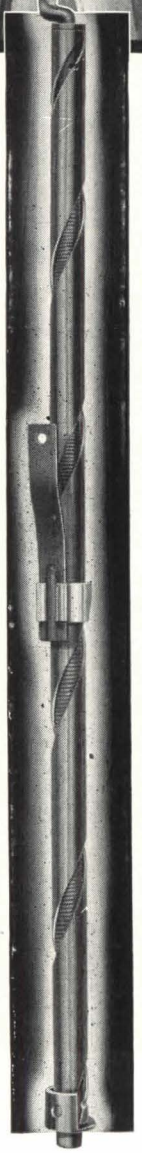
In the meantime Grand Rapids Invisible Sash Balances—thousands of sets—are being used in defense housing projects and may still be sold on priority in critical areas. They are not, however, obtainable for general civilian use.

Be sure to furnish necessary priority with your orders to facilitate prompt shipment.

And on the Home Front

Grand Rapids Invisible Sash Balance has earned high endorsement for its smooth, dependable performance under varying climatic conditions. It is quickly and easily installed, saves time and cost. Nevertheless, research and experimentation are continuing and progress is being made to the point that long before the Invisible Sash Balance is again available to the public generally it will be a greatly improved product in every respect.

Send for catalog and we will gladly give you full information concerning this product together with complete delivery information.



GRAND RAPIDS *Invisible* SASH BALANCE

GRAND RAPIDS HARDWARE COMPANY
GRAND RAPIDS • • MICHIGAN

THE BEST PAINT COSTS LESS IN THE LONG RUN

DOUBLE-WHITE house Hillsborough, Cal. with Blue Collopake trim. Architect: Mario Corbett, San Mateo, Cal.

EXTRA PROTECTION and longer life are provided by Cabot's Collopakes because they are *collodial paints*. The pigments are divided, by a patented process, into sub-microscopic fineness and inseparably united with life-giving, wear-resistant oils.

GREATER BEAUTY. The paint film on the home is smooth, tough, shows no brush marks—holds its rich color and glowing beauty for years.

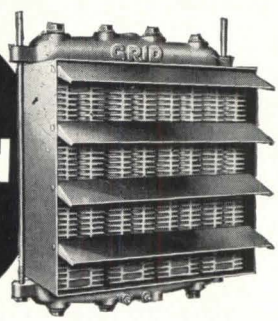
FREE WHITE BOOK. Contains full information on Collopakes (collodial paints). Illustrated. Write for your copy and color card today. Samuel Cabot, Inc., 1278 Oliver Bldg., Boston, Mass.

Cabot's

DOUBLE WHITE and GLOSS COLLOPAKES

IT'S STILL A *different* UNIT HEATER

NOW made with CAST IRON Heating Sections



High test cast iron takes the place of aluminum for the heating sections, to cooperate with the war effort in using substitute materials—but it's still the ultimate in unit heater quality.

THE new Grid is engineered along the same lines as the Grid Unit which had aluminum heating sections—dependable, long life unit. Designed for performance. Patent applied for. No corrosion—no leaks or breakdowns . . . In this new Grid Unit there is only one type metal in contact with steam or hot water. There is nothing to cause electrolysis that produces corrosion. Engineered and constructed to withstand up to 250 lb. steam pressure. Ask for engineering data.

D. J. MURRAY MFG. CO., Wausau, Wis.

Offices in Principal Cities

GRID UNIT HEATER

DESIGN OF

MODERN INTERIORS

by JAMES FORD AND KATHERINE MORROW FORD

The first comprehensive survey of recent American interior design, exclusively in terms of modern architecture and related arts. Analyzes the latest advance in modern custom design—shows how to apply to defense housing—discusses best placement for circulation, privacy, comfort, safety, storage, and general convenience. Explains choice of colors, materials, designs, etc. 324 illustrations. 132 pages. 124 architects and designers represented. 8½ x 10¾. Cloth bound. $5.00.

GUIDE TO STANDARD SPECIFICATIONS

by Harold Sleeper, AIA

Federal specifications in the construction field—with notes on their use. Arranged by trades in twenty-three divisions. A time and labor saver for specification writers. 28 pages—8½x11—50c.

THE RESTORATION OF COLONIAL WILLIAMSBURG

A pictorial survey including floor plans, elevations, details, maps and garden plans, samples of paint colors, etc. Textual story by the Restoration architects and designers. 104 pages, 9x12, blue cloth covers, $1.50.

WORKING DETAILS, PART I: DOMESTIC

Edited by Mildred W. White. (Published in England) A comprehensive study on the subject of closer integration of functional units. Illustrates handling by various internationally known architects of such details as windows, doors, staircases, kitchens, furniture, fireplaces, etc. $4.00.

BOOKS

For War-Time Reference

The books listed below are especially helpful for architects and engineers in solving technical problems pertaining to war-time construction and the protection of the civilian population.

PLANNED A.R.P., by Tecton, Architects. 138 pages — extensively illustrated with photographs, diagrams and maps—$2.50.

CIVIL AIR DEFENSE, by Lt. Col. Augustin M. Prentiss, U.S.A. A 334-page illustrated treatise on the protection of the civil population against air attack—$2.75.

BOMBS AND BOMBING, by Willy Ley. 124 pages—A brisk, popular survey explaining how the several kinds of bombs are made and their probable effect on buildings of different types and on air raid shelters—$1.25.

CIVIL DEFENSE. by C. W. Glover. Over 900 pages—fully illustrated, revised and enlarged. The most complete and authoritative book on the subject. This volume discusses in detail the precautions necessary for the protection of the civilian population—$16.50.

CLOSING OUT!

The American Hospital of the 20th Century

by Ernest Stevens

A 550-page treatise on the development of medical institutions, both in Europe and America; third edition, revised 1928. Contains a wealth of background information especially useful in writing or speaking on the subject—22 chapters—over 600 illustrations. Much data unobtainable elsewhere.

(was $15)

while they last—$3.75

SIMPLIFIED ENGINEERING

FOR ARCHITECTS AND ENGINEERS

By HARRY PARKER, Professor of Architectural Construction, University of Pennsylvania

Presents the design of beams, columns, slabs, etc., so simply, so concisely, that you can readily follow the explanations without previous training in the subject. Brings to your fingertips the important terms and basic principles employed in the design of structural members in building construction—with a host of examples illustrating just the sort of problems that must be faced in practice. No preliminary knowledge of the subject required. Theory and derivation of formulas reduced to a minimum. All necessary tables are included, no other books required to supplement its use. 214 pages—96 illustrations—flexible binding—$2.75.

Any of the above books will be mailed postpaid anywhere in the United States. Send your order and payment direct to

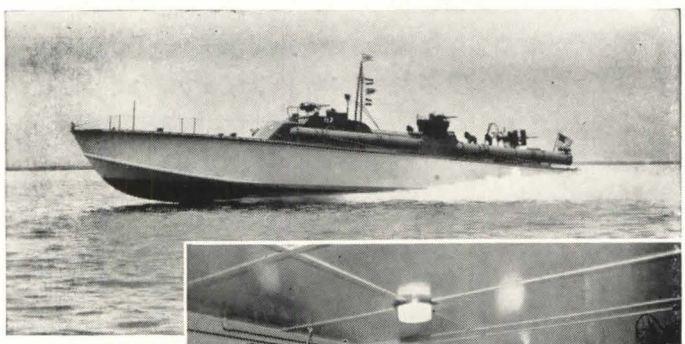
ARCHITECTURAL RECORD BOOK DEPT. 119 WEST 40TH STREET NEW YORK, N. Y.

Four outstanding boats built by Chris-Craft with exterior-type fir plywood: *(from left)* U. S. Army Q boat, U. S. Army Aircraft Rescue boat, U. S. Navy Picket boat, U. S. Navy Troop Landing boat.

BOATS...

are one of Douglas Fir Plywood's most interesting War uses!

●Exterior-type Douglas Fir Plywood is serving in all kinds of Army and Navy boats and in Liberty ships because it is so easy to fabricate . . . so lightweight . . . so resistant to damage yet, if damaged, so simple to repair . . . Remember, the many war jobs Douglas Fir Plywood is doing *now* will make this miracle wood far more useful to you *after Victory!*



Thousands of square feet of exterior-type Douglas Fir Plywood go into the hulls of the Navy's sturdy, lightning-fast PT boats. Constructed by Elco Naval Division.

The cabins in Kaiser Liberty ships are snug, thanks to walls and ceilings of Douglas Fir Plywood.

TO HELP SPEED VICTORY the Douglas Fir Plywood Industry is devoting its entire capacity to war production. We know this program has your approval.

SEND FOR NEW WAR USE FOLDER

Dozens of photographs show many of the war jobs Douglas Fir Plywood is doing all over the world. You'll find it extremely interesting. It's free, of course. Douglas Fir Plywood Association, Tacoma, Washington.

DOUGLAS FIR PLYWOOD

Real Lumber

MADE LARGER, LIGHTER SPLIT-PROOF STRONGER

FOR THE PIPING YOU ARE PLANNING

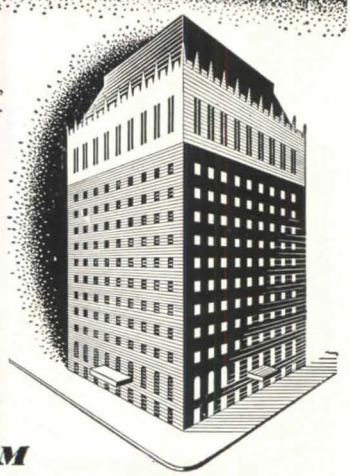
SPECIFY CRANE VALVES AND FITTINGS

CRANE...

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVE., CHICAGO

Forecast For Tomorrow

The Fontenelle today establishes the standard of hotel excellence for 1952. The new guest rooms, smart lobbies and beautiful dining rooms reflect this modern trend. Hotel Fontenelle is the address of satisfaction.



THREE RESTAURANTS

★ ★ ★

BOMBAY-BLACK MIRROR ROOM

AMBER ROOM

KING COLE ROOM

Hotel FONTENELLE

OMAHA'S ***WELCOME TO THE WORLD***

For Qualifying Data

on 172 firms of CONTRACTORS and ENGINEERS see Section 1 in the new, 1943 Sweet's File, Architectural

Government awarding authorities and all others who have need of specific information from which to determine contractors', sub-contractors' and engineers' qualifications will have these data instantly accessible at all times in Sweet's File, Architectural, now being distributed.

The new Section 1, "Contractors and Special Services," contains more than 400 pages of information on personnel, equipment, specialization, labor relations, financial background, etc., regarding 172 firms, located at many different points, and covering a wide range of experience.

Development and enlargement of the "Contractors and Special Services" section was undertaken in answer to hundreds of requests for such information. Incorporated in Sweet's, along with technical data on materials and equipment, it will be on hand for ready reference, whenever needed.

SWEET'S CATALOG SERVICE
Division of F. W. Dodge Corporation
119 West Fortieth Street New York

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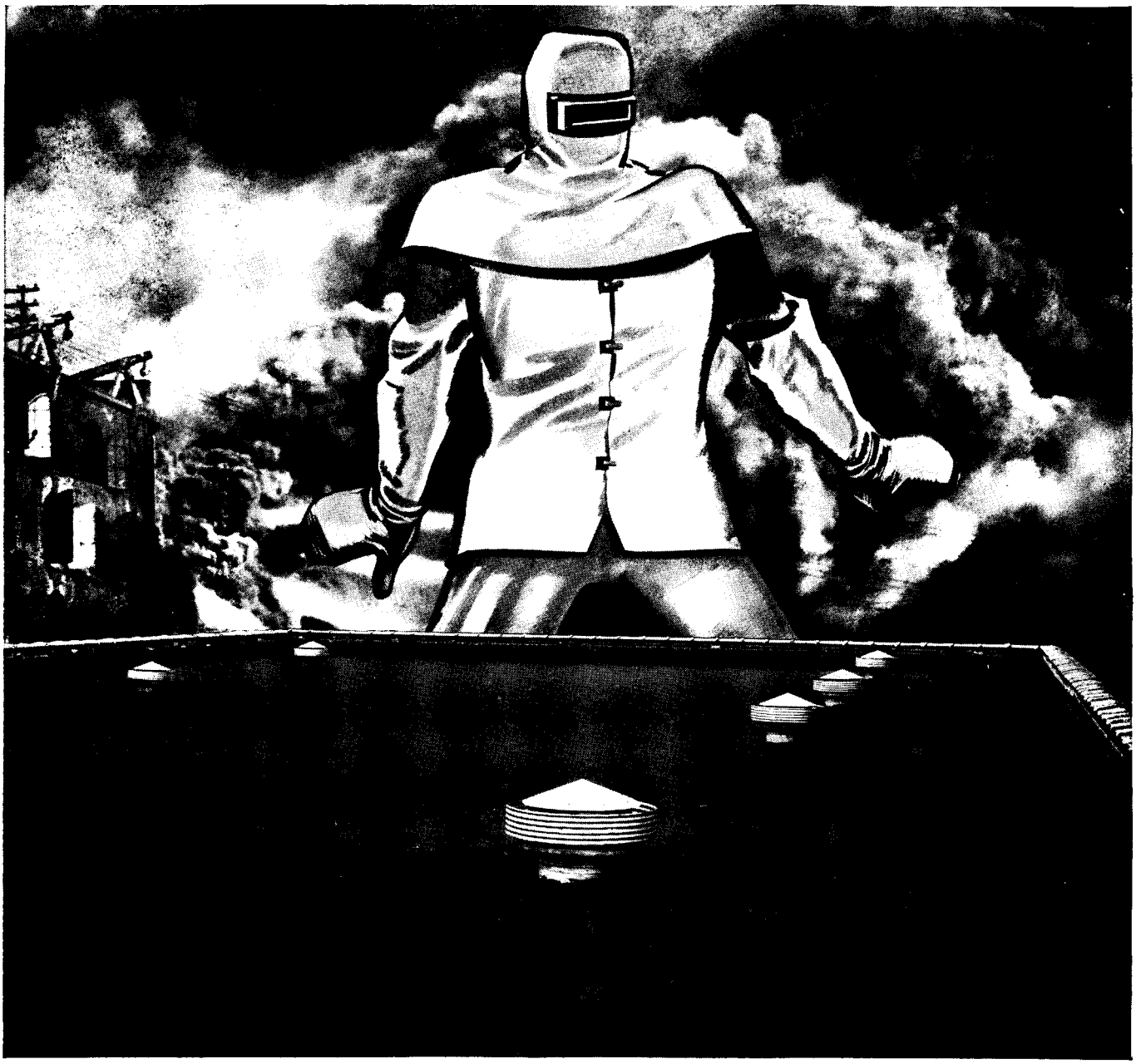

ASBESTOS *stands guard day and night against* ROOF-COMMUNICATED FIRE!

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

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

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

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

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville

Asbestos

Built-Up Roofs

They Will Read This **FREE** *Book 'Till* **V-DAY** *Comes... and* **LONG AFTER!**

This remarkable book, Home Owners' Catalogs, is now in the homes of thousands of families who are planning to build for their own occupancy after the war. It is also in the permanent libraries of other thousands who completed their homes before 1942.

It is only natural that a book so highly regarded as is Home Owners' Catalogs should be a vital factor in private planning for post-war homes. Copies which are presented to home owners now, without cost or obligation, will be read and studied more thoroughly and completely than any that have gone before—until V-DAY, and long after the pressure of post-war home building has subsided.

SURVEY SHOWS THAT HOME OWNERS' CATALOGS ARE KEPT FOR YEARS

A survey made in the early part of last year reveals that 82.6% of the 1937 group who responded still had their copies of Home Owners' Catalogs. Of the 1938 group, 80.5% answered in the affirmative. In 1939, the figure was 96.7%; in 1940, 95.7%; and in 1941 it was 85.2%. Large percentages also indicated additional use of Home Owners' Catalogs long after the home building period—and the habitual loan of the book to friends and acquaintances.

Home Owners' Catalogs is a large cloth-bound volume, containing a wealth of valuable information about home building products and services. A section on home planning, designed to aid in the orderly tabulation of family needs and individual requirements—as related to layout, material and equipment—is especially endorsed by architects. It serves to clarify owner thinking and to maintain interest in the home building program.

We will send Home Owners' Catalogs, by mail, prepaid—without charge—to those who expect to build homes for their own occupancy when war and priority conditions permit.

Your clients who receive this comprehensive and beautifully illustrated free volume (same page size as Sweet's) will be better prepared for conferences with you. That will mean a lot when the rush of post-war activity begins.

Home Owners' CATALOGS

Distributed FREE by F. W. DODGE CORPORATION, 119 West 40th Street, New York, New York

Home Owners' Catalogs will be sent to owners who plan to build homes for their own occupancy, within 12 months, or as soon as war and priority conditions permit, in the 37 states east of the Rocky Mountains, costing $4,000 or more for construction, exclusive of land—or to modernize at a cost of $2,000 or more. The F. W. DODGE CORPORATION RESERVES THE RIGHT TO DETERMINE THE VALIDITY OF EACH APPLICATION.

F. W. DODGE CORPORATION, 119 West 40th Street, New York, N. Y. AR-2-43

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Send with compliments of .....