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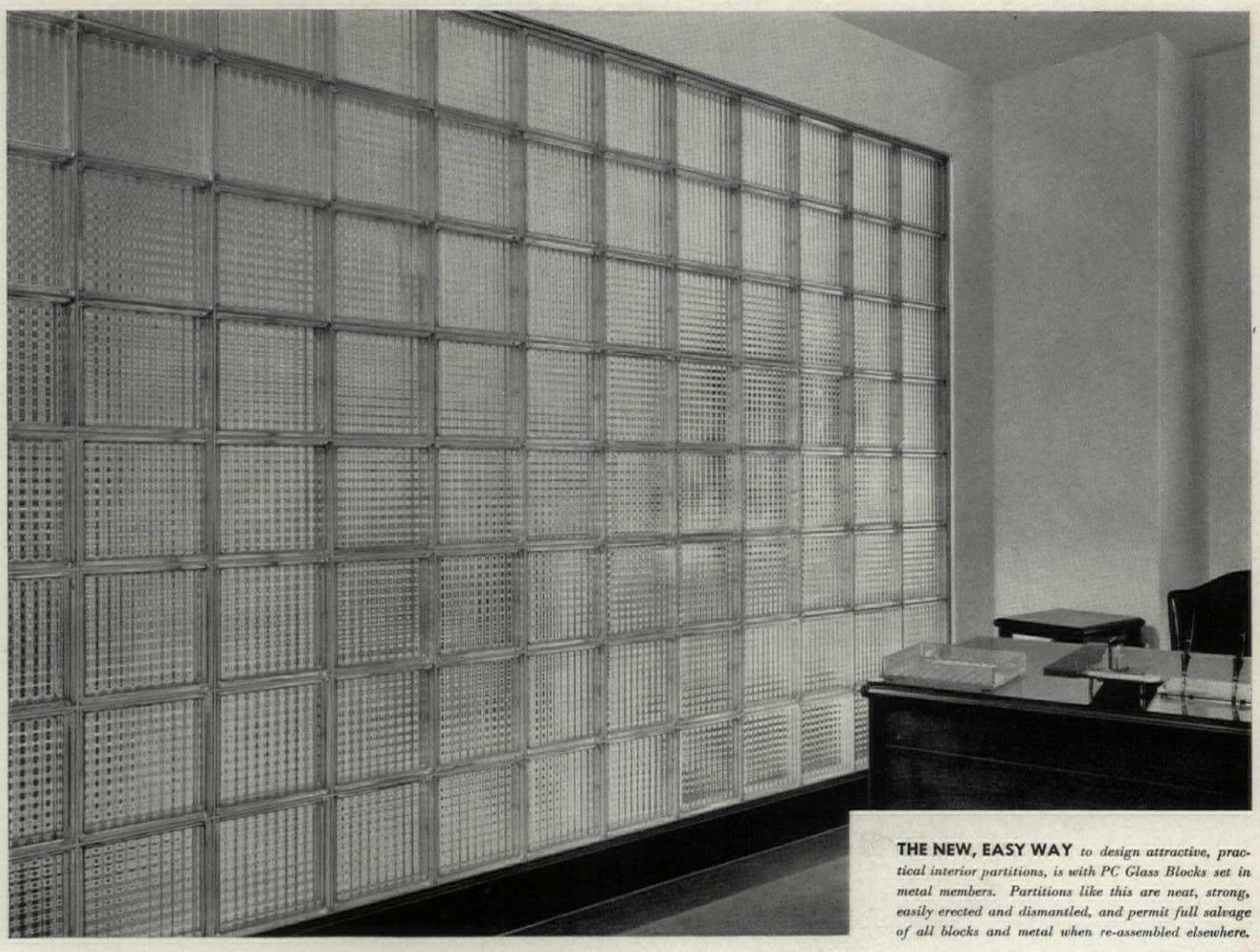

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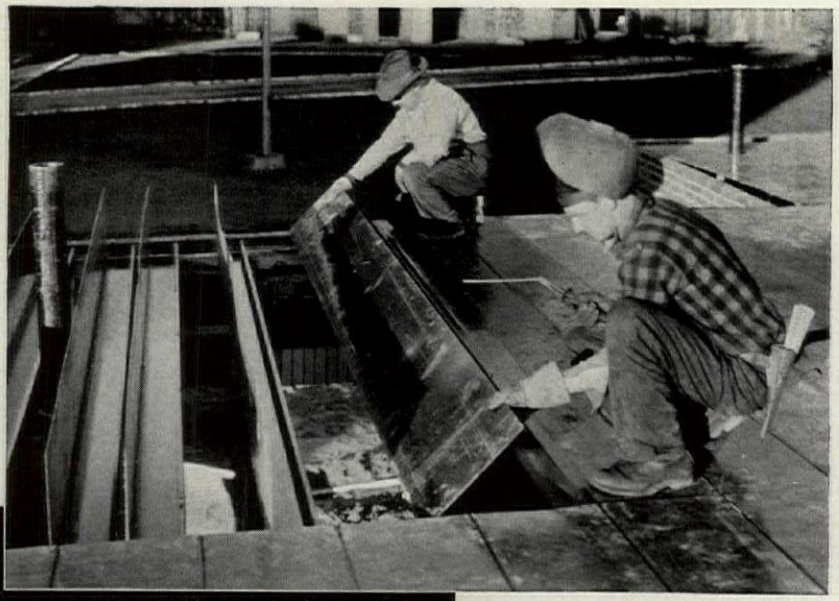

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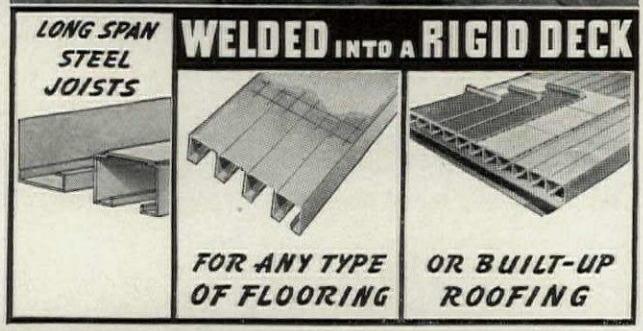

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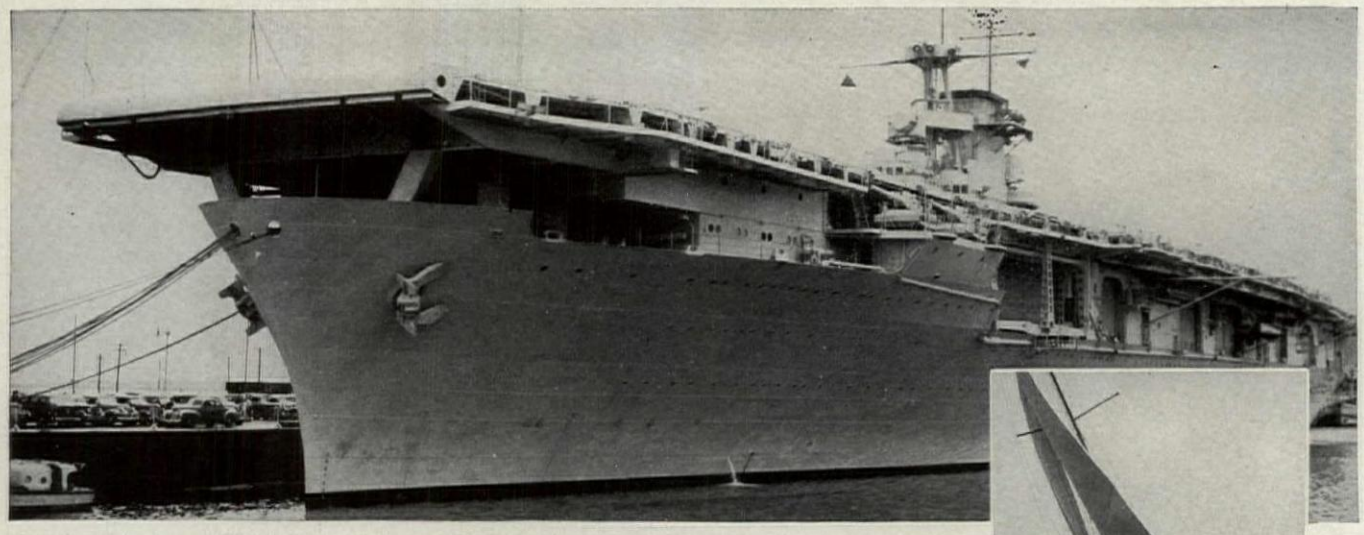

Whether it's a small sailing craft or a battleship (in the U. S. S. Wasp, above, over 12,000 sq. yards of Sloane-Blabon Linoleum was used), a small service office (Western Union, left) or a huge floor area (Cities Service Company, New York, below) Sloane-Blabon Linoleum meets the most exacting specifications.

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● Any Sunday afternoon, starting Sept. 29th, tune your radio to your local Columbia Station at 5:00 P.M., E.S.T. You'll hear a new program—"Design for Happiness"—a regular half-hour devoted to the American Home. It tells people of the new effects they can achieve with glass, and urges them to build new homes *now.* It is probably the biggest effort ever put behind glass—should give appreciable impetus to home-building.

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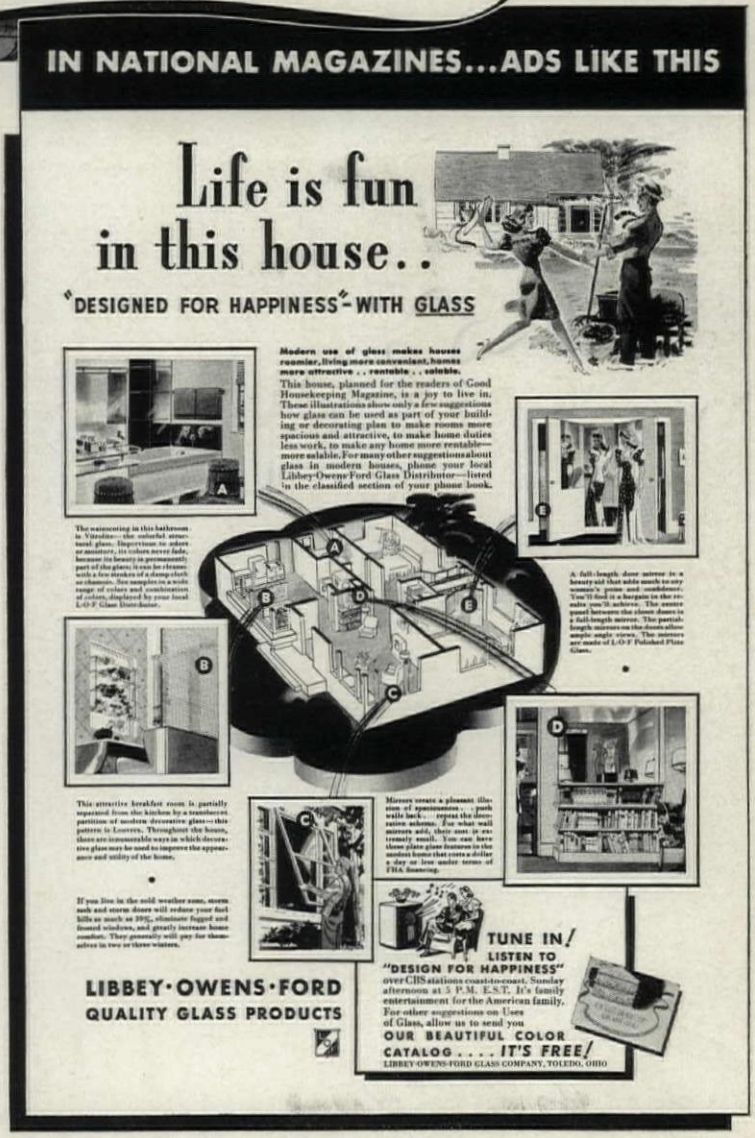
IN NATIONAL MAGAZINES...ADS LIKE THIS



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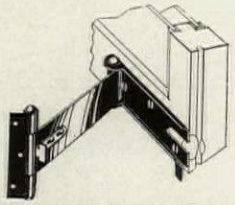

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THE THRESHING FLOOR

EDITOR'S NOTE—*Since the present situation in Washington is highly complicated, rapidly changing, and admittedly vague in some of its aspects,* PENCIL POINTS *has arranged with Dr. A. D. Taylor of Cleveland to provide for our readers an analysis and evaluation of the National Defense activities. It is our intention to continue giving information of maximum benefit to those readers directly or indirectly interested in this tremendous program. The technical planning professions deserve to know what is going on. We trust that Dr. Taylor's study of government activities and his personal observations in Washington will be of immediate benefit to our readers.*

Rapid progress is being made in the National Defense Program as follows: (a) awarding of contracts for construction; (b) developing organization to execute construction work; and (c) increasing personnel necessary in Washington to administer defense program. A considerable number of engineers, architects, and landscape architects are being employed, mostly in the Quartermaster General's Office and in the Bureau of Yards and Docks, for technical work on the different phases of construction projects. In some of these positions (generally concerned with technical planning), these men are being taken from the Civil Service lists. In other positions, men not on the Civil Service register are being appointed.

2. As shown below, a number of major projects, including cantonments, defense housing, airports and air fields, and other large projects, have been authorized, and are in the planning stages or the construction stage. Contractors, engineers, and architects have been appointed on the major portion of these projects, either through the Federal agencies or through local sponsoring agencies.

3. Two major bills are under consideration, providing funds for defense housing which will be undertaken on a vast scale, especially if the emergency requires continuation and expansion of the construction preparedness program. It is estimated that more than 125,000 units may be required to meet the housing demand. These units, as constructed to date, represent a cost ranging from $3,000 to $3,500 each. It is therefore evident that the proposed appropriation in these two bills, totaling $250,000,000 is only a part of the ultimate amount of money required for housing alone.

Senate Bill 10263 has passed the House of Representatives and the Senate. It has been signed by the President, and makes $100,000,000 available for the Army and the Navy to continue their part of the program of defense housing.

House of Representatives Bill 10412 has passed the House of Representatives and is now before the Senate (it probably will be passed before this report is published). This bill makes available to the Federal Works Agency, to be expended by the Public Buildings Administration, the sum of $150,000,000. An Amendment to this bill, approved by the House of Representatives, reads as follows:

> "Nothing in this act shall be construed to prevent the Administrator from employing or utilizing the professional services of private persons, firms, or corporations."

Under this bill, the Public Buildings Administration is authorized to make surveys and investigations, plan, design, construct, remodel, extend, repair, demolish structures, etc. . . . on lands or interest in lands acquired under the provisions of this bill, etc. . . .

Copies of these bills may be procured from the Clerk of the House of Representatives or the Clerk of the Senate.

The agencies through which defense housing will be administered are, from present indications, as follows:

- Public Buildings Administration (through the Office of the Supervising Architect).
- War Department (through the Construction Division of the Quartermaster General's Office, and possibly through the Engineer Corps).
- Navy Department (through the Bureau of Yards and Docks).
- United States Housing Authority (through Local Housing Authorities, and direct through the U.S.H.A. in localities where local Housing Authorities do not exist).
- Federal Housing Administration (for projects of a permanent character).
- Farm Security Administration (this agency may be engaged in some part of this program).

4. Contract forms for the employment of technical planning services have been approved by the Quartermaster General's Office and designated as "Cost-Plus-A-Fixed-Fee" Contract for "Architect-Engineer Services." This contract form is available upon request through the Quartermaster General's Office. It is the result of numerous conferences between representatives of the architectural and engineering professions, and representatives of the Quartermaster General's Office. This final contract form contemplates separate contracts for the employment of contractors, engineers, and architects.

A similar type of contract form is expected to be used for the employment under separate contracts of contractors, architects, and engineers on major construction projects, a number of which contracts have been awarded.

A form of contract has been submitted by a committee from the A.S.C.E., the A.I.A., and the A.S.L.A., to the Federal Works Agency, for the employment of engineers, architects, and landscape architects, to work on a collaborative basis on defense housing projects.

5. In all probability there will be a conference between officials of the United States Housing Authority, and representatives of the technical planning professions to discuss schedules of fees, especially applicable to technical planning and supervisory services required on defense housing projects.

6. The Office of Information in the Defense Council is continuing to make available bulletins of information. The Office of Government Information expects to have ready for distribution on September 23, the latest edition of United States Gov-

ernment Manual containing complete information on the functions and personnel of Government Agencies, including the new defense agencies (price $1.25). This is an invaluable reference volume for those individuals and companies interested in the defense program.

Additional information will be published in releases from the Office of Government Information each two weeks and are available upon request.

7. An extensive program in the construction of Troop Housing by the Army and the Navy, for troops and other enlisted personnel, is in progress or contemplated in a large number of locations throughout the United States. Detailed information on these Troop Housing projects is available in a release from the National Defense Advisory Commission, marked as "P.R.—75,—dated August 20, 1940."

8. Under the Federal Works Agency and through the Works Progress Administration, an extensive program of planning and of construction work is either in progress or contemplated in connection with enlargements of municipal airports, and creation of new air fields as training centers for army pilots.

9. The United States Housing Authority has recently published a most informative bulletin (No. 35) on "Policy and Procedure" for defense housing projects. For all who are interested in defense housing under the U.S.H.A., this bulletin is a valuable reference.

From this bulletin it is learned that because of the tremendous increase in the naval and army forces, and the increase in workers in the manufacturing centers, the U.S.H.A. must turn its attention to defense housing projects consisting of:

(1) Those projects undertaken by local authorities with U.S. H.A. assistance.

(2) Those projects developed by the U.S.H.A. in areas where local authorities do not exist or unable to proceed with adequate defense housing.

(3) Those army and navy projects leased by these agencies for defense housing, which may be constructed by the U.S.H.A., by the Army, or by the Navy, with U.S.H.A. funds.

(Continued on page 12)

DEFENSE HOUSING PROJECTS

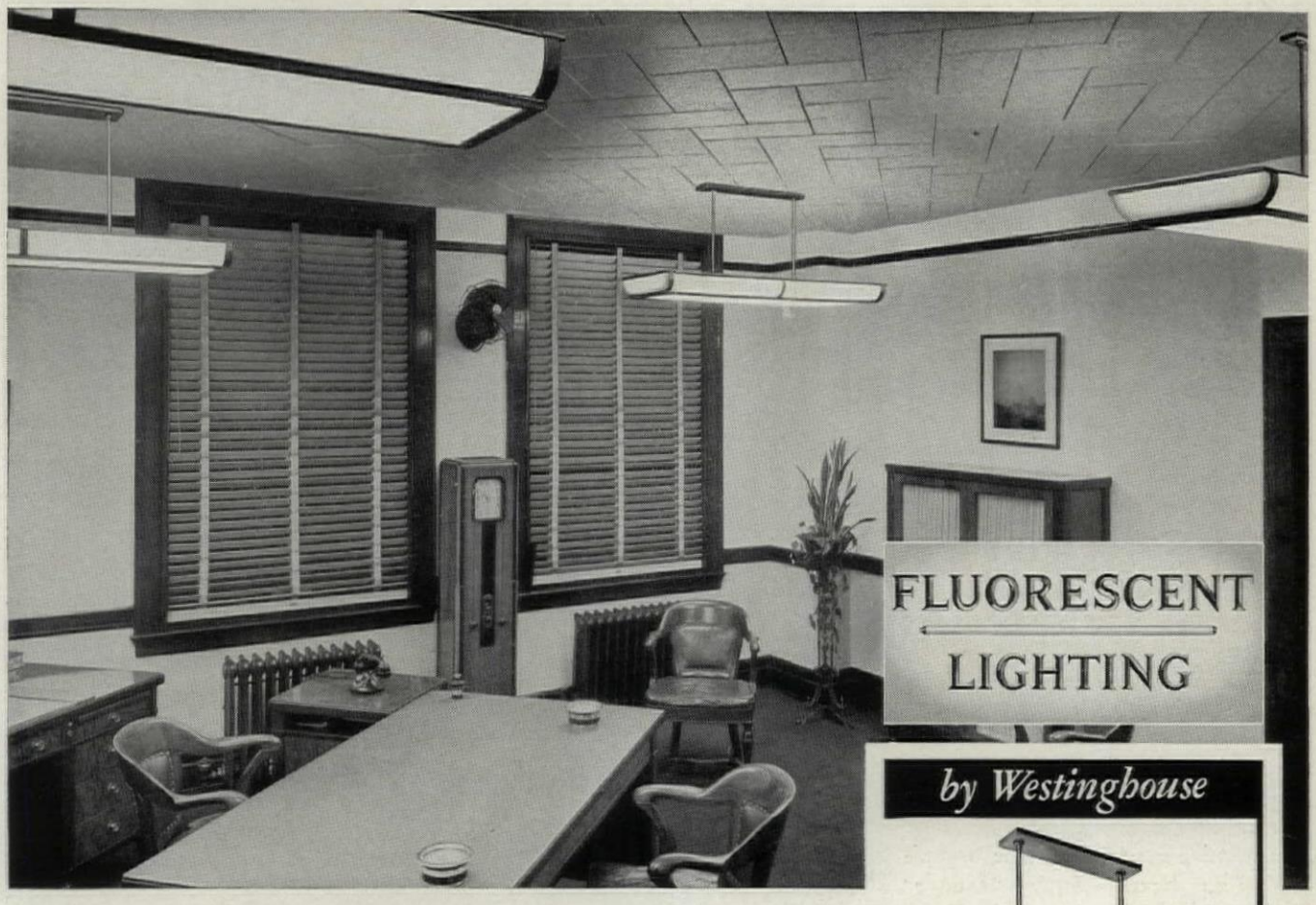
(The following tabulation contains information on defense housing projects for which funds have been allotted, to be expended through the different government agencies.)

State	*Locality*	*No. of Units*	*Approximate Expenditure*	*Tenancy*
Alabama	Montgomery	424	$1,450,000	Personnel at Maxwell Field Army Base.
Alabama	Selma	112	406,000	
Alabama	Selma	96	373,000	
Alaska	Anchorage	325	1,625,000	For Army, with money from USHA.
Canal Zone		400	1,600,000	For Navy, with funds from USHA.
California	Mare Island	600	2,400,000	For Navy, with funds from USHA.
Connecticut	Hartford	1,000	4,307,000	For workers in defense industry.
Florida	Pensacola	200	715,000	Enlisted personnel in Navy.
Georgia	Columbus (Ft. Deming)	614	2,024,000	Personnel in Army.
Illinois	East Moline	200	850,000	Workers in arsenal.
Illinois	Rock Island	200	1,260,000	Workers in arsenal.
California	Stockton		365,000	Temporary housing at Stockton air field.
Illinois	Champaign County	100	465,000	
South Carolina	Charleston	400	1,416,000	Personnel in Navy.
Texas	Corpus Christi	250	989,000	Personnel in Navy.
Rhode Island	Newport	262	1,110,000	Newport Naval Station.
Virginia	Portsmouth	200	742,000	
Virginia	Portsmouth	400	1,400,000	
Virginia	Newport News	350	1,274,000	
Virginia	Newport News	150	530,000	
Virginia	Norfolk	500	1,800,000	
Washington	Bremerton	450	1,485,000	
Washington	Bremerton	150	518,000	

GENERAL PROJECTS (OTHER THAN HOUSING)

State	*Location*	*Agency Expending Funds*	*Kind of Work*	*Approximate Expenditure*
Alabama	Selma	Federal Works Agency (WPA)	Army barracks and buildings	$ 273,000
Alaska	Kodiak and Sitka	Navy	Naval air base	14,900,000
Alaska	Anchorage	Army (Quartermaster Corps)	Army air base	11,800,000
Arizona	Ft. Huachuca	F.W.A. (PWA)	Improving Army buildings and facilities	25,000
Arizona	Ft. Tuthill	F.W.A. (PWA)	Improving National Guard facilities	27,000
Arkansas	Rogers	F.W.A. (WPA)	National Guard Armory bldg. and grounds	23,500
California	San Diego	Navy	Naval air base	18,000,000
California	Alameda	Navy	Naval air station	9,800,000
California	San Francisco	Quartermaster Corps	Temporary (Army) housing	37,000
California	March Field	F.W.A. (WPA)	Army air base improvements	377,000
California	Moffett Field	F.W.A. (WPA)	Army air base improvements	223,000
Canal Zone	Albrook Field	Quartermaster Corps	Army engine testing, and depot building	2,271,000
Florida	Orlando	Quartermaster Corps	Temporary Army buildings at airport	292,000
Florida	MacDill Field	Quartermaster Corps	Army hangar buildings	1,065,000
Florida	Tampa	F.W.A. (WPA)	Army air base improvements	1,159,000
Florida	Pensacola	Navy	Naval air station	4,000.000
Florida	Miami	Navy	Naval air station	3,500,000
Florida	Jacksonville	Navy	Naval air station	12,800,000
Illinois	Rock Island Arsenal	F.W.A. (WPA)	Army grounds improvement and utilities	122,000
Illinois	Great Lakes Training Station	F.W.A. (WPA)	Naval building improvement	290,000
Illinois	Savanna Depot	F.W.A. (WPA)	Improvements to Army depot	147,000
Indiana	South Bend	Federal Loan Agency (RFC)	Army aviation plant expansion	18,600,000
Indiana	South Bend	F.W.A. (WPA)	Army improvement at St. Joseph Airport	226,000
Kansas	Wichita	F.W.A. (WPA)	Wichita Municipal Airport	248,000
Kansas	Ft. Riley	F.W.A. (WPA)	Army grounds improvement and utilities	166,000
Maine	Ft. Williams, McKinley & Preble	F.W.A. (WPA)	Army road improvement	161,000
Maine	Ft. Williams and Levett	F.W.A. (WPA)	Army building improvement	244,000
Massachusetts	Ft. Banks & Ft. Heath	F.W.A. (WPA)	Improve Army buildings and grounds	74,000
Massachusetts	Ayer	F.W.A. (WPA)	Improve Army buildings and grounds at Ft. Evans	99,000

. . . TOMORROW'S ILLUMINATION TODAY !



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High Illumination Values—at least twice the light, without glare or shadow;

50 Per Cent Cooler Light—permitting much closer placement of the fixture to the job; important in air conditioning.

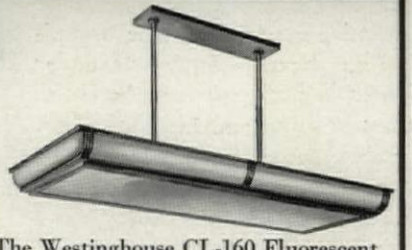
The Type CL-160 Commercial Luminaire is available with either plain or decorated glass bottom, or with louver instead of glass. With louver, it provides more direct light, while the glass basins create semi-direct illumination.

Continuous Strip Lighting—for halls, general offices stenographic and drafting rooms—is available in the Type CL-40 fixture in one or two lamp lengths. By using extension sections, continuous runs may be easily installed. This Luminaire is available only for ceiling mounting.

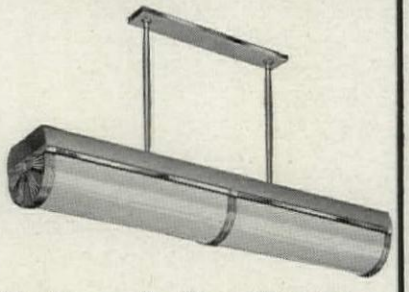
Another popular Westinghouse Fluorescent Luminaire is the three-lamp CL-110, which is furnished with or without glass diffusing shield as a combination indirect-direct unit or, without the top lamp, as a direct source of illumination. This fixture is also available for surface mounting.

117 Westinghouse Electric Supply Company offices or Independent Westinghouse Lighting Distributors are at your service locally with stocks and engineering services. Westinghouse Electric & Manufacturing Company, Lighting Division, Edgewater Park, Cleveland.

Tune in "Musical Americana," N. B. C. Red Network, Coast-to-Coast, every Thursday evening



The Westinghouse CL-160 Fluorescent Luminaire with ribbed or decorated glass bottom panel.



This fixture, the Type CL-110, has three lamps, is furnished with or without glass diffusing shield, and may be had for surface mounting.

Westinghouse

FLUORESCENT LIGHTING

(Continued from page 10)

In the above projects, as contrasted with Low Rent Housing projects, U.S.H.A. funds may be used to provide 100% of the development cost, therefore not requiring any local loan as is required on Low Rent Housing projects.

10. Locations in which major defense construction projects are contemplated, are determined by the high officials in the Army and the Navy, having a thorough knowledge of the requirements imposed in the defense program. So many communities have sought to procure for their locality some of these defense projects, and have used every means to persuade government officials to give favorable consideration to specific localities, that the Army and the Navy now preserve a very secret procedure, with the result that no information concerning these major projects is available until the final decision as to location, size, and use has been reached.

11. The magnitude of the major defense projects is such that the Government must have a complete and an efficient organization to represent its interests and to guarantee the proper and efficient planning and construction procedure. The organization on the major projects under the War Department is generally as follows:

Contractor, Engineer, and Architect employed under separate contracts are selected by the Secretary of War on the recommendation of the Quartermaster General's Office to work under the direct orders of the "Project Construction Quartermaster" who in turn is appointed by the Quartermaster General.

The organization working under the Project Construction Quartermaster, and charged with responsibility for the separate divisions of the work, is constituted as follows, and these responsible heads of the separate divisions are selected by the Project Construction Quartermaster and approved by the Quartermaster General's Office.

Chief Material Clerk (in charge of records, reports on receiving and distribution of material for projects).

Chief Time Inspector (in charge of records, reports, etc., on employment, for the Government and the Contractor).

Chief Voucher Clerk (in charge of financial records and reports).

Chief Traffic Clerk (in charge of records of shipments, government bills of lading, and expediting of shipments of material).

Chief Equipment Clerk (in charge of inspection and records for equipment).

Chief Commissary Clerk (in charge of records and reports on purchase of supplies, and responsible for operation of commissary).

Most of these positions will be civilian appointments, applications for which should be filed with the Construction Division of the Quartermaster General's Office, and, in general, applicants for these positions will be interviewed at the site of the project by a representative from the Auditor's Office.

12. A further statement has been issued by the National Defense Advisory Commission, designated as "P.R. —74;—August 19, 1940," setting forth the general functions of the office of Defense Housing Coordinator. This statement is an amplification of the statement issued from the Defense Housing Coordinator's Office dated July 20, 1940, and can be procured upon application to the National Defense Council.

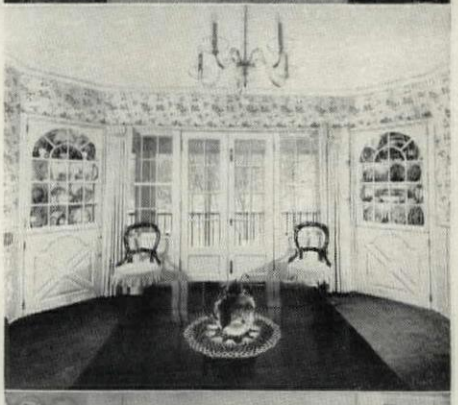
13. With the increasing demand for adequate national defense, and because of the kind of equipment required for such defense, the need for military roads or "Defense Super-Highways" is becoming increasingly evident. Such highways are a necessary part of the defense program and it is understood that approximately $200,000,000 is being appropriated to begin the construction program on such highways.

A. D. TAYLOR

(Table continued from page 10)

State	*Location*	*Agency Expending Funds*	*Kind of Work*	*Approximate Expenditure*
Michigan	Detroit	Quartermaster Corps	Tank manufacturing plant (Army)	$20,000,000
Minnesota	Hibbing	F.W.A. (WPA)	Army improving airport	45,000
Mississippi	Meridian	F.W.A. (WPA)	Improvement at Key Field Airport (Army)	194,000
Missouri	St. Louis	F.W.A. (WPA)	Improving grounds and building at Jefferson Army barracks	50,000
Montana	Helena	F.W.A. (WPA)	Army Armory building and grounds	99,000
Nebraska	Ft. Robinson	F.W.A. (WPA)	Improving Army building and utilities	24,000
New Jersey	Raritan	F.W.A. (WPA)	Constructing Army roads and tracks, Raritan Arsenal	77,000
New Mexico	Albuquerque	F.W.A. (WPA)	Army barracks at Municipal Airport	33,000
New York	Ft. Schuyler	F.W.A. (WPA)	Grounds improvement (Army)	49,000
New York	Newburg	F.W.A. (WPA)	Improving Stewart Airport (Army)	594,000
North Carolina	Charlotte	F.W.A. (WPA)	Improving Charlotte Airport (Army)	60,000
Ohio	Columbus	F.W.A. (WPA)	Army building and grounds improvement, Ft. Hayes	5,000
Ohio	Columbus	F.W.A. (WPA)	Army building and grounds improvement at Columbus General Depot	329,000
Ohio	Dayton	F.W.A. (WPA)	Army buildings and grounds improvement at Wright Field	27,000
Ohio	Ravenna	Quartermaster Corps	Ammunition Loading plant (Army)	14,000,000
Maryland	Annapolis	Navy	Building at Naval Academy	1,200,000
Rhode Island	Warwick	Federal Works Agency (WPA)	Hangars at airport (Army)	344,000
Rhode Island	Quoncet Point	Navy	Naval air station	24,200,000
South Carolina	Parris Island	Navy	Naval aviation facilities and temporary housing	2,400,000
Texas	Corpus Christi	Navy	Naval air station	23,300,000
Texas	Ft. Ringold	F.W.A. (WPA)	Army buildings and grounds improvement	84,000
Virginia	Norfolk	Navy	Naval air station	13,700,000
Washington	Seattle	Navy	Naval air station	4,600,000
Washington	Lakeview	F.W.A. (WPA)	Improvement of facilities at McChord Field (Army)	315,000

ARCHITECTURAL WOODWORK



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CRITICAL YOUTH WIELDS THE FLAIL

EDITOR'S NOTE—*Due to limited space Student Letters have given way this month to Letters to Students, written by two Architects deeply interested in this particular section — which is conducted by* PAUL PIPPIN *of the School of Architecture, Columbia University.*

MAKE UP YOUR MIND

During the past two or three years I have been fortunate enough to be asked to visit and criticize or discuss the problems of several of the architectural schools, and the defect that impresses me most strongly, and which is universal in all the schools, is the inability of the average student to make up his mind. In studying any problem the first thing that should be done is to examine the various factors which enter into a decision—the space requirements, the cost (if it is to be considered), the architectural treatment of the exterior, and most important of all—the problems of entrance and circulation. There is an almost infinite number of ways in which a reasonably satisfactory solution of any problem can be reached, but the average undergraduate apparently does not ever clearly face a problem; but fiddles around for two or three weeks on alternative plans, and then works like the devil for two or three days and nights to make his final drawing about which he invariably says, "I really didn't have time to complete it." If he would sit down at the beginning and make up his mind as to what he wanted to do and spend his time perfecting not only the scheme but also the presentation of it he would, in my opinion, make much more use of the time than is generally the case, and when he gets out into an office, he will realize the necessity for speed—not haste, but speed.

I find office-trained draftsmen are, as a class, more apt to make me money than school-trained ones, at least for some years, because these men know that they have got to make money for their employers or get out. They have a much more realistic approach. Nor do I believe that, on the whole, they are inferior in design; when I look back a few years upon America's great architects, and I find that *Klauder, Cram, Goodhue, Lindeberg, Platt,* and *Ayres* had no formal architectural training; we have pretty definite proof that a man can be a great architect with "office schooling" only. And these men have succeeded as architects primarily because they had minds to make up and were able to make them up. Personally, I believe that twice as many problems per year with a requirement that the draftsmanship be of a better standard than that at present required, would force men to make up their minds just as they are forced in an office, and would greatly improve the schools.

AYMAR EMBURY II

What is Modern Architecture? Before one can teach, practice, or even learn a profession, one must have a clear understanding of its essential factors.

Modern architecture is today what the great architecture of every age has been; it is the art of building beautifully, and the science of building practically, to fulfill the contemporary needs—social, regional, ideological and economic—of the people.

Modern architecture is not a style, nor a system of building that can be reduced to æsthetic or scientific formulae. Like the new architecture of the Medieval and Renaissance periods, Modern Architecture is international today; indicating that now, as then, a vital change—social and cultural—has traversed the civilized world. It is also regional, as recent American developments show. Whereas we did accept European examples during the early phase of the new movement, we have refused to follow European prescriptions verbatim, and are developing an expression that conforms to our own needs, tastes and traditions.

Decoration and texture, and the architectonic use of materials are, as they always have been, factors of building today. The fluent controversy, by and against the purists, confirms rather than denies that fact. Like a man's beard, these are ever-recurrent problems that have to be contended with. Sometimes he may treat it as a decoration, or—in the interest of pure form—he may at times eliminate it entirely. One way or the other, his essential nature or function is not changed.

Fashion and the dominance of outstanding personalities contribute greatly to the superficial variations of architecture, and excite strong preferences and prejudices; but however forceful these influences may be, they must not be mistaken for fundamental elements.

How does all this relate itself to the teaching of Architecture, which is my own preeminent concern? In very brief summary, I see it like this: The student must understand the society for which he will build. He must know the science of building. His taste and perceptions must be developed, and his imagination must be stimulated. Above all, he must be induced to think clearly and independently. He will thus acquire the capacity to recognize and estimate that which is transitory, or secondary in value; he will not be inclined to follow fads, either of public mood or of spectacular personalities.

Those who think keenly usually grow controversial because they evolve strong convictions or disagreements, or because they ask questions of themselves or of the world. This column is a most effective outlet for the healthy exercise of expressing opinion, and it should prove to be both stimulating and provocative.

Congratulations to the editor, and also to the past and future contributors.

DEAN LEOPOLD ARNAUD
School of Architecture
Columbia University

Vital Industries Select

TRANE UNIT HEATERS

AIR

The new Boeing Stratoliner ... built in plant heated by Trane Unit Heaters.

New Plant of Pratt & Whitney, Division Niles-Bement-Pond Company, West Hartford... Connecticut.

Another heating problem solved through teamwork. Here are the gentlemen who cooperated on the installation of Trane Projection Unit Heaters in the new hangar at the duPont Airport, Wilmington, Delaware. Left to right: Mr. A. A. Granke, Trane Wilmington representative; Mr. Joseph J. Rapuano, Heating Contractor; Mr. H. S. Stees, Architect and Engineer; and Mr. Agostino Fortunato, General Contractor. Distributor: Speakman Company.

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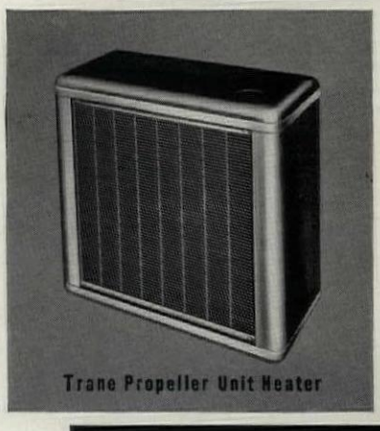
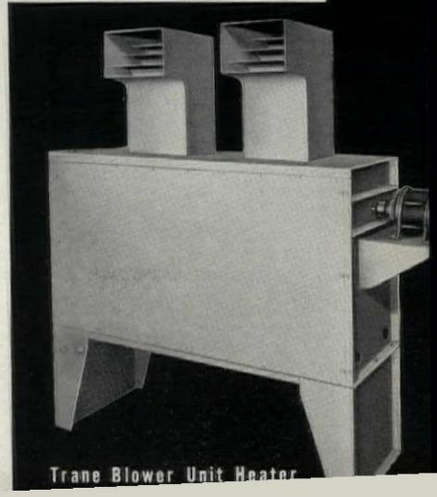
VATIONAL defense, fast delivery, and plant expansion go hand in hand. t's why they have found such an ideal ning mate in Trane Unit Heaters—the Unit Heaters for all industrial heating irements. Trane has fifty-five years of rience and knowledge in correct heating your benefit. Trane pioneered and intro- d the only advancement in unit heating ver a decade—the Trane Projection Heat- This is the Unit Heater which the on's leading architects, engineers, con- tors, and industrials have recognized as correct solution to many heating prob- .

ationwide coverage! Trane has a nation- coverage of eighty-five offices staffed ompetent men trained to borate with trade and profession and to give nationwide, on-the-spot service—the same service given the Austin Company, general contractors, and W. E. Beggs, heating contractor, for the Boeing Aircraft Company at Seattle—the same service given Albert Kahn, Inc., architect and engineer, and the Donald Miller Company, contractors, for Pratt & Whitney at West Hartford, Conn.

Trane recognizes fast delivery as the watchword of the hour. Vital firms like Boeing Aircraft and Wright-Aeronautical have found it expedient and profitable to select Trane Unit Heaters for their new plants. And remember — Trane manufactures the most complete line of heating, cooling, and air conditioning equipment commercially available—for comfort and process.



Trane Propeller Unit Heater



Trane Blower Unit Heater

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HERE, THERE, THIS & THAT

BOSTON NOTES

My chance encounter with a fast-moving architect brought out the fact that he was moving not clientwards, but to join the B.S.A. "I want to fight for registration," he said, and spoke of experiences in a blueprint waiting room. As he had stood there a young man entered and unrolled drawings for the printer, putting a question to the clerk as he did so. "What grade of pencil do I use to draw windows?" he asked. "I use an H for outlines and clapboards, but what do I need for windows?"

The practitioner, above-mentioned, was minded to have his ears blown out, and when he observed that the young gentleman's name appeared on the drawings as architect for Zilsch Homes, Inc., everything went black. Dazedly he groped towards ye olde So-and-so, gulped a bracer, and started running for the B.S.A.

To date and from personal, perhaps too cursory, local observation 'twould seem that new governmental construction is going the way we feared it might; directly to contracting companies, who hire architectural and engineering service in minimum amounts and by the hour.

We fondly hope that architects are not parasites of the building industry, but in high, hard-bitten places they never quite seem to have proven themselves any more vital to the success of defense structures than mistletoe is to the life of a red maple. In time of national emergency, when everyone feels like doing something on the helpful side, is it forever the architect's fate to be frustrated in the proper application of his ability? We ask ourselves.

F. E. Hertel, of Stone and Webster's, gave the Architectural League of Boston some of his valuable time at the August 29th meeting, and clarified numerous aspects of architectural adjustment among the engineers. Optimistic as to its feasibility he did not promise, however, that our whole drafting force could be absorbed, even with things stepped up above present demands.

From Worcester we have word of the death of *Lucius W. Briggs*, a true gentleman of the old school, whose long and considerable practice in that affluent mid-state city is being carried on by son *Stuart Briggs*. To architects of Mr. Briggs' high ethical plane, the rough and tumble of later years must have posed many somber speculations.

Ralph Bowers is reported up from Williamsburg, and looking like a Southern planter at the height of his powers. Said one, "If he should enter Locke-Ober's, Charlie would rush out a julep just as naturally as a newsboy asks, '*Transcript*, Sir?' of a Bostonian wearing tortoise-shell rims and a Collins & Fairbanks hat."

Arthur Englund announced the establishment of his office in Lowell, some weeks since, and the grapevine telegraph says he's busy.

Bert Buffey tells me the Boston Architectural Club will have got going ere this is printed, its opening dinner having been set for October 2nd. Later in the month comes the summer sketch exhibition.

When recently the writer called upon a friend at the Boston Navy Yard the twain were apprehended as suspicious characters by an earnest reserve officer, and marched peremptorily to hdqtrs. This item is cited because of its bearing on the shape of things to come, wherein all exotic devices and deviations from the norm will be anathema to our guardeens. Architectural individualists had better make the best of a bad business and cut slits in their nightshirts while yet there is time. In this instance, said writer was advised that he looked like a bloody furriner by reason of certain hirsute eccentricities, hitherto esteemed merely a harmless mistake. Official recommendation advised the ministrations of a barber; regimentation I calls it!

LEON KEACH

Major A. B. McMullen

A name new to many of our readers is that of Major A. B. McMullen whose article, "The Development of Airports," on page 615 of this issue is his generous contribution to the fund of information assembled for Architects and Designers under the general topic "Airports." Since 1937 Major McMullen has been Chief of the Airport Section, Civil Aeronautics Authority (formerly Bureau of Air Commerce).

He has had long experience in aviation. During and immediately following World War I, he served in the Army Air Corps, later operating his own aircraft sales and flying company in Tampa, Florida, for 13 years. During this period he also operated airports in Jacksonville and Gainesville, Florida. He was the first Director of the Aviation Division, Florida State Road Department, which he organized in 1933. In that capacity he planned and exercised general supervision over the development of 70 new airports and landing fields in Florida, as well as the enlargement and improvement of 40 existing fields. He was also author of the "Florida 10-Year Program of Aviation Development."

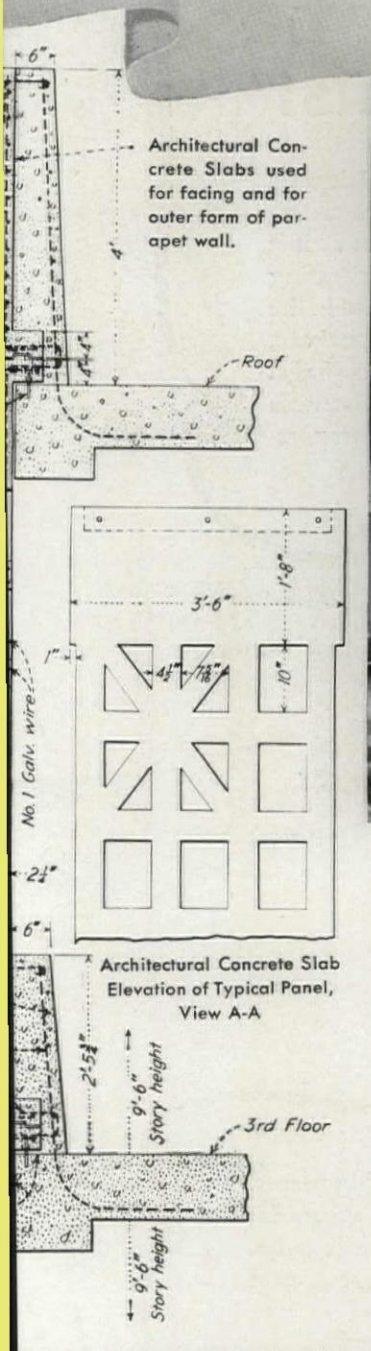
Major McMullen holds a reserved commission in the Air Corps and has to his credit 11,650 hours as a pilot.

A.I.S.C. CONVENTION

The 18th Annual Convention of The American Institute of Steel Construction will be held at The Greenbrier, White Sulphur Springs, West Virginia, October 15th to the 18th.

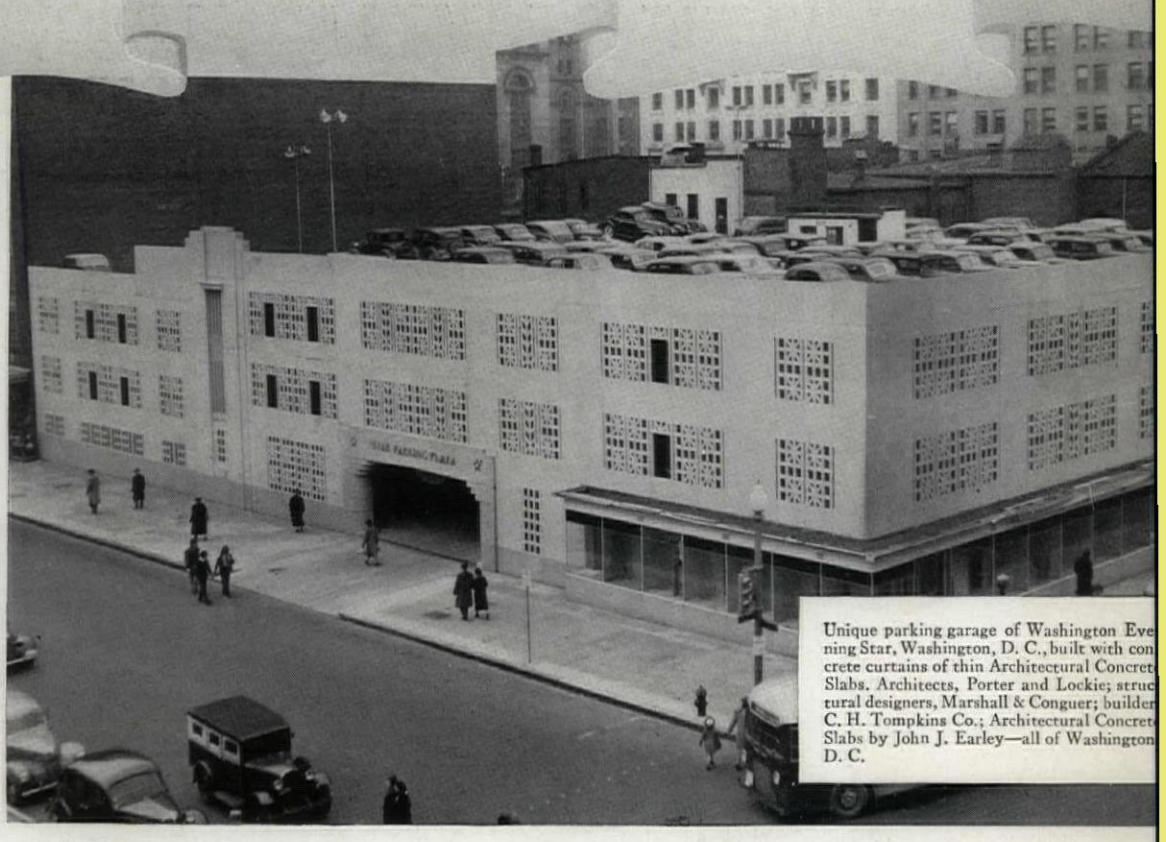
CURTAINS OF CONCRETE

two inches thin!



Architectural Concrete Slab Elevation of Typical Panel, View A-A

al Vertical Section showing how Architectural Concrete Slabs are at- d to garage floors. Also elevation of slab section, A-A. Diagram shows lug returns at top and bottom are monolithically with the facing slab, tted with tongue and groove, and ored with dowels and reinforcing ties which the fender curb is subse- ly placed. The facing of thin Archi- ral Concrete Slabs also was used as ter form for the parapet wall at top nder curb at each floor.



Unique parking garage of Washington Eve ning Star, Washington, D. C., built with con crete curtains of thin Architectural Concret Slabs. Architects, Porter and Lockie; struc tural designers, Marshall & Conguer; builder C. H. Tompkins Co.; Architectural Concret Slabs by John J. Earley—all of Washington D. C.

Architectural Concrete Slabs, hung from floors, provide decorative exterior walls with high structural strength, eliminate cost of fenestration and sprinkler system, save construction time, and allow adequate light and ventilation for a 3-story garage.

THAT is part of the story of a unique parking structure built at unusually low cost at Washington, D. C. The use of thin Architectural Concrete Slabs—little more than 2″ thick, yet with strengths of 8,000 to 10,000 pounds per square inch—eliminated the need for 9″ masonry walls and reduced the support such walls normally require. At the same time, they served as forms for the parapet and the fender curbs on the parking floors (*see sketch*).

The Architectural Concrete Slabs, measuring 3½′ x 9½′ x 2¼″ thick, are hung from the floors. They form a decorative concrete curtain of pleasing texture between the open structure and the street. They are made with Atlas White cement and exposed yellow quartz aggregate, reinforced by a 4″ x 4″ welded, galvanized mesh. Their size cuts construction time and reduces the number of joints. Perforations in certain of the slabs take the place of windows to provide light and ventilation as well as decoration. Larger openings allow direct access for firemen, saving the cost of expensive fire-protection equipment.

Write for further information, or see SWEET'S CATALOG—Section 4. Universal Atlas Cement Co. (United States Steel Corporation Subsidiary), Chrysler Bldg., New York City.

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P-A S 27

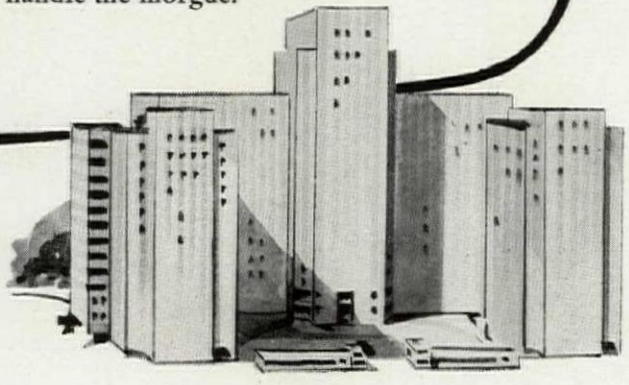
RCHITECTURAL CONCRETE SLABS

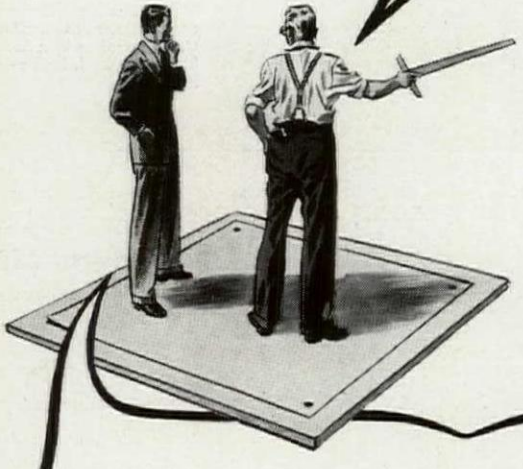
MADE WITH ATLAS WHITE CEMENT

ATLAS WHITE

"NOW THAT'S WHAT I MEAN ABOUT THE FLEXIBILITY OF 'FREON'* REFRIGERANTS!"

Eleven refrigerator stations had to be supplied with refrigeration in New Orleans's new $12,000,000 Charity Hospital. Requiring a wide variety of temperature conditions, they would have presented a tough design problem for the architect . . . if it hadn't been for the flexibility of load and control that's possible with refrigerating equipment using "Freon" refrigerants. Two Frick "Freon-12" machines, located in the basement, successfully provide refrigeration to boxes for vegetables, ice, fish, bakery, diet kitchen, meat, milk, small cook, large cook, dairy products and even garbage. Moreover, they permitted locating of the boxes throughout the basement at distances as great as 300 feet from the compressors. Two other Frick "Freon-12" compressors were installed in the sub-basement to handle the morgue.





I've found that same flexibility a big advantage in locating air conditioning plants, too. The system can be placed right in the space to be cooled, or close to material receiving the refrigeration, because "Freon" is harmless and its operation is quiet. "Freon" plants are so compact that they take up little floor space or headroom. And their light weight permits roof installations where desirable.

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Why 3 DESIGN DECADES Have Chosen Medusa White

The past decade of design has chosen Medusa White as one of its outstanding building materials. But Medusa White was also selected by the previous ten years of design and by the decade before that. Architects, for more than 30 years, have selected Medusa, the original white Portland cement, to create buildings in stucco and cast stone that have outstanding individuality and charm.

On this page are shown two examples of the use of Medusa White stucco in the past design decade, one the beautiful home of the radio comedian and movie star, Bob Burns. Architect H. J. Knauer, contractor James E. Denham and plastering contractor Ross Green utilized Medusa White stucco manufactured by the Standard Stucco Co. of Burbank, Calif. . . . A. N. Gaefler recently remodeled his Hollywood Terrace, using Medusa White stucco applied by A. D. Hoppe, plastering contractor and supplied by the Blue Diamond Co. of Los Angeles.

Medusa White stucco is the most versatile of all building materials. It meets all color and texture requirements for stucco and creates marvelously beautiful cast stone trim. In the next design decade, use Medusa White, that has so faithfully served during the past 30 years. Send the coupon below for the Medusa White Stucco book.

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This rendering of the new chapel and religious education building of Brigham Young University is by the Architect, Fred L. Markham, of Provo, Utah. This $190,000 building, now under construction, is representative of the architectural style favored by The Church of Jesus Christ of The Latter Day Saints

POTOMAC PATTER

NOTE: Any resemblance of that glass enclosure atop the Procurement Division Building (which houses the Office of the Supervising Architect, Public Buildings Administration) to the latest in drafting room designs is purely accidental! That odd-shaped, blue-glazed cubicle is nothing less than the full-sized model of the 100% daylight observation tower for your nation's largest airport, now under construction at Gravelly Point, Virginia, indirectly (as the sea gull flies) across the Potomac. Your Civil Aeronautics Authority wants perfection—or close to it, anyway. We have no doubt that they will get satisfaction. Under Consultant Architect

(Continued on page 22)

Maple Creates a New Vogue in Home Floors

Today it is realized that floors which harmonize with furniture make a decided difference in home beauty

Maple is again in the spotlight for home floors. Not because of its almost eternal smoothness, its longer life, or its easier cleaning—but because architects and decorators have discovered that Maple holds the key to new beauty in modern homes.

The principle is simple: Modern furniture is fine-grained—so is Hard Maple. Combined, the two present a close harmony of furniture and flooring.

Hard Maple virtually becomes "part of the furniture," doesn't compete for attention, supplies a blending background that shows furniture at its best.

Home-owners, acquainted with this modern flooring contribution through national magazines, have been quick to appreciate its importance; so that today, Hard Maple is creating a new vogue in home floors.

When you specify Hard Maple flooring, you insure satisfaction not only with performance and permanence, but with the lifetime of extra beauty it adds to homes.

For Hard Maple at its best—specify **MFMA.**

MAPLE FLOORING MANUFACTURERS ASSOCIATION
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See our catalog data in Sweet's, sec. 11/78.

Photos from modern home in Highland Park, Illinois. Paul Schweikher, Architect —Schweikher, Lamb & Elting, Chicago.

WRITE FOR THIS INTERESTING DEMONSTRATION FOLDER

This is the folder for which hundreds of home-owners and building prospects have written. Entitled "A Glimpse of an Interesting Modern Home," it is a room-by-room demonstration of the unusual beauty which results when floors are in grain-harmony with furniture. It includes photographic reproductions of Hard Maple in a range of actual colors. Every architect should see it. For free copy, just write.

Floor *with* MFMA Maple

REG. U. S. PAT. OFF

(NORTHERN HARD)

(Continued from page 20)

Howard L. Cheney's able guidance, his group in the O. S. A. has done what we consider a bang-up job. Excellent paper work was contributed by *Charles Goodman* and *Howard "Jug" Chandler,* a pair of designers and delineators of the first water. Of course, we can't tell at this stage how perfect the entire project will turn out, but it sure is expansive. (And a typographical error in the second vowel would not be entirely amiss either.)

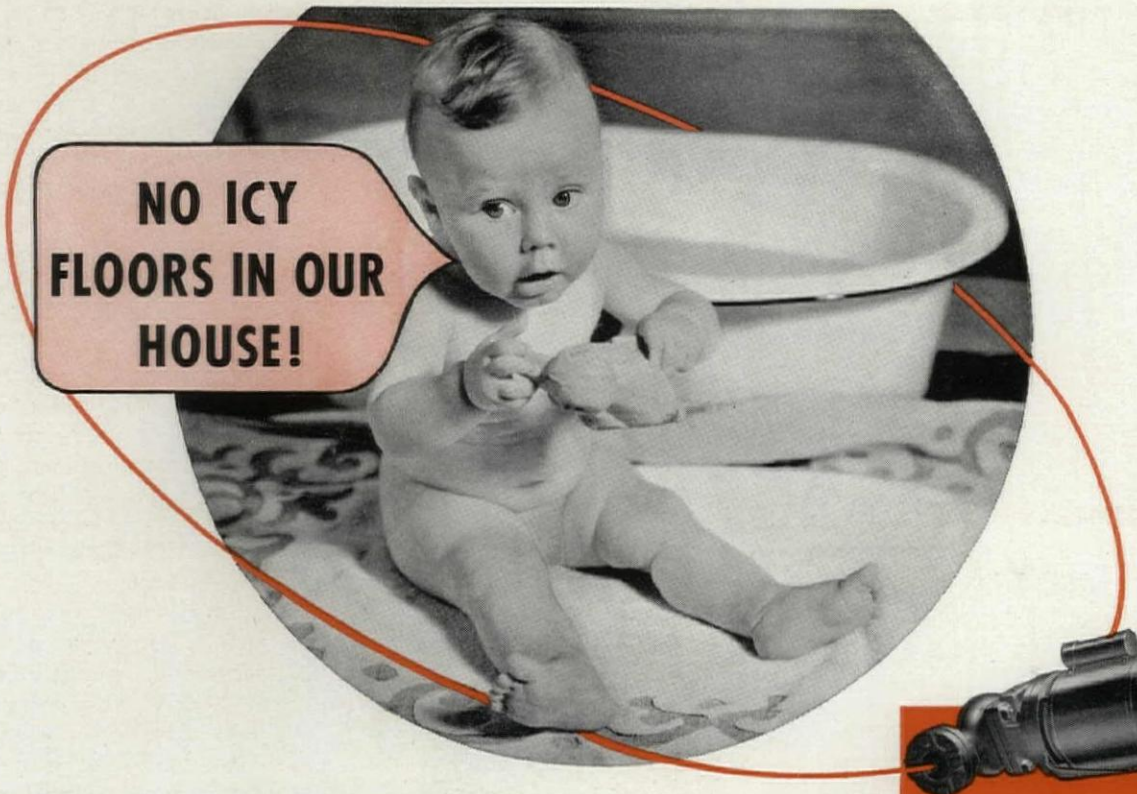
On the other hand, we feel inclined to "go for" the idea suggested by one of our sagacious Congressmen — underground hangars. Although the landing field is in reality a sand and gravel fill on the banks of the Potomac, underground hangars are entirely feasible; for the adjacent land is a rather high terrain. While the cost may be considered prohibitive, its defensive features are invaluable. At best, a row of tremendous hangars spread around the field above grade becomes a disproportionate architectural incongruity.

With the Albany Office out of work, many of the New York State's Architectural gentry are rushing back to the "promising" Potomac. We don't want to be discouraging, but as we recently told *Irv Cahn,* an old Procurement friend, now back from Albany, Agricultural Engineering, Federal Housing and Public Buildings are now reduced to a minimum force with little work on the board. The P. B. A., however, is anticipating a defense housing program. The Veterans Administration and Indian Affairs are holding their own. The U. S. Housing Authority is not taking on architectural men, but we understand from our field agent that construction supervisors will soon be needed. Maritime's Interiors and Styling Branch is going full blast, with a full house. However, the possibility for expansion in that office cannot be too remote, as witness the Civil Service Examination coming up. We have it on good authority that they have need of one first class decorator and furniture man whose qualifications will be determined by severe test. Regarding this defense construction, we can only repeat what was once told us back in 1928 when applying for a position with Smith, Hinchman & Grylls of Detroit; "Young man, come into our drafting room and if you can find space to set up a card table and a small board, you have a job." We started the following week at George D. Mason & Co.

Lucky *Lloyd C. Mayers* picked off the cream of all ultra-modern decorative jobs hereabouts when the Washington tent of the Variety Club remodeled their club rooms at the Willard Hotel. What with the lavish use of flexglass, suntan floating mirrors, textiled walls of magenta red with a wide, white floral striping, a burgundy monobelle linoleum wainscot, an apple green festooned dado, an appropriately (?) painted acoustical ceiling and adequate illumination by fluorescent lighting—the room befits the character and quality of the theatrical profession.

Now, a compliment indeed: we have it first hand from the contractor, who admitted that "the best money he had ever spent was for the architectural services" in connection with the construction of his own home. Architect *Joseph A. Parks* rendered the services for this contractor.

Put a mark on the wall for our side. RED



CONTINUOUSLY CIRCULATED HOT WATER HEAT PUTS AN END TO STRATIFICATION

Never before have you been able to specify and *get* a heating system which so closely approaches your ideal in heating comfort . . . and at so low an operating cost! To the many advantages of forced hot water heating, Hoffman Hot Water Controls now add hair-breadth regulation of room temperature. When installed on either new or remodeled hot water heating systems, the old troubles of "Cold 70", overheating and uncomfortable variations in temperature are eliminated for good.

Hoffman Hot Water Controlled Heat combines *continuous circulation* with indoor-outdoor temperature controlling devices which effect a constant balance between heat loss and heat supply. Heat is supplied to the radiators on a gradually ascending or descending temperature scale—always matching the weather.

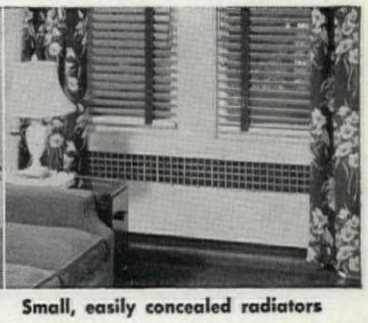
The three basic operating units of Hoffman Hot Water Controlled Heat are adaptable to any type of automatically fired hot water boiler. Designing the system for high B.T.U. emissions, plus *constant* maintenance of heat at exactly the right degree, permits the use of minimum size radiators. *This means easy concealment and a material saving in installation cost!* The system is ideal for indirect domestic water heating, producing an ample supply of hot water, winter and summer.

Send for literature describing fully the installation and operation of Hoffman Hot Water Controlled Heat units

No "Cold 70" or variable room temperatures

Exact balancing of heat supply against heat loss

Low cost, year around domestic hot water



Small, easily concealed radiators

HOFFMAN Hot Water CONTROLLED HEAT

Hoffman Heating Specialties are sold everywhere by leading wholesalers of heating and plumbing equipment

HOFFMAN SPECIALTY CO., INC., DEPT. PP-10, WATERBURY, CONN.

COMPETITION ANNOUNCEMENTS AND PRIZES

The Museum of Modern Art, 11 West 53rd Street, has announced two design competitions for home furnishings. Competition I is open to any resident of the United States (except employees of the Museum of Modern Art). Competition II is open to any resident of the twenty other American republics of Mexico, South and Central America and the West Indies. The two competitions will run approximately fourteen weeks. All entries for Competition I must be postmarked not later than midnight Saturday, January 11, 1941, and must be submitted anonymously as directed in the program of rules and conditions for the competition. All entries for Competition II must be submitted anonymously and must *reach* the Museum not later than January 15, 1941.

Judges for both competitions will be: *Alvar Aalto*, Finnish architect and furniture designer, Professor of Architectural Research at Massachusetts Institute of Technology; *Edward Stone*, New York architect; *Alfred H. Barr, Jr.*, Director of the Museum of Modern Art; *Catherine K. Bauer*, Special Consultant to the United States Housing Authority; and *Edgar Kaufmann, Jr.*, Design Editor of "New Directions," Merchandise Manager in Home Furnishings of Kaufmann's Department Stores.

Entry blanks and printed program of rules and conditions will be mailed upon application to the Competition Director:

Eliot F. Noyes, Director
Department of Industrial Design
The Museum of Modern Art
11 West 53rd Street
New York, N. Y.

Competition I. The purpose of this competition is to select a group of designers capable of creating a useful and beautiful environment for today's living, in terms of furniture, fabrics and lighting. In order to bring the best designs on the market, arrangements have been made whereby stores and manufacturers will commission the designers selected through this competition, and work with them on the production and sale of their designs.

Competition I is divided into the following categories:

1. Seating for a living room.
2. Other furniture for a living room. (Mechanical equipment such as radios, phonographs and clocks is not included.)
3. Furniture for a dining room.
4. Furniture for a bedroom.
5. Furniture for a one-room apartment.
6. Furniture for outdoor living on terraces or porches of a house or apartment.
7. Movable lighting equipment to provide illumination for several uses; i.e., for reading, eating, writing and so forth. These are not to be built-in fixtures.
8. Woven fabrics — for drapery, upholstery, or other uses.
9. Printed fabrics — for drapery, upholstery, or other uses.

The winning designer in each category within 30 days after the final judgment will receive an offer from a manufacturer to enter into a contract for the production of the

(Continued on page 26)

FORMICA column covering, wainscot and counter tops in the Greyhound Bus Terminal at Washington, D. C., contributed a great deal to neat, modern appearance of this unusually good-looking station, designed by Wischmeyer, Arrasmith & Ellswick of Louisville.

In the upper photo the lower part of the wainscot is brown Formica with metal trim, and in the lower photo the counter front is the same material, the column covering is dark red Formica, and the counter tops dark gray.

Cleanliness, durability, freedom from upkeep and maintenance make Formica especially adaptable for use in public rooms.

The Formica Insulation Company ••• 4620 Spring Grove Avenue, Cincinnati, Ohio

(Continued from page 24)

winner's designs as selected by jury.

Competition II. For residents of Mexico, Guatemala, Honduras, Salvador, Nicaragua, Costa Rica, Panama, Cuba, The Dominican Republic, Haiti, Venezuela, Columbia, Ecuador, Peru, Brazil, Bolivia, Chile, Paraguay, Uruguay, and Argentina. The purpose of this competition is to discover designers of imagination and ability in the other Americas, and to bring some of them to New York for a period of a few months.

Each competitor in this competition is required to submit original drawings for a few pieces of furniture such as might be used in a living room, a dining room, a bedroom, or an outdoor area. About four pieces would be considered a normal submission. As in Competition I, the entries are to be submitted anonymously to Mr. Noyes.

MEDALS AWARDED

Alpha Rho Chi, national social fraternity limiting its membership to students of architecture and the allied arts, has awarded its Bronze Medal for Leadership, Service, and Merit to the following graduating seniors from schools recognized by the American Institute of Architects:

Albert Arneson, University of Minnesota; *Charles Evans Hughes, III,* Harvard University; *James Bowden Addy,* Georgia School of Technology; *John H. Farrens,* University of Michigan; *Manuel Morris,* Kansas State College; *Rolland Orval Simpson,* University of Washington; *John Garth York,* University of Texas; *Thomas Shelton Jones,* Columbia University; *Charles S. Ash,* University of Kansas; *J. Lee Thorne,* Pennsylvania State College; *J. Herbert Brownell,* University of California.

Lawrence M. Pleasant, Ohio State University; *John Blossom Thomas,* Syracuse University; *Robert Charles Taylor,* University of Illinois*; *Leif Eric Olsen,* University of Illinois*; *John Phillip Hamill,* Alabama Polytechnic Institute; *Charles Gordon Lee,* University of Pennsylvania; *Tallie B. Maule,* Oklahoma A. & M. College; *Kenneth M. Schaefer,* Washington University; *Ieoh Ming Pei,* Massachusetts Institute of Technology; *Herbert Francis Heidt,* Carnegie Institute of Technology; *T. Freeland Sims,* University of Southern California.

** The University of Illinois had two candidates who were considered equally qualified to receive the award.*

The Alpha Rho Chi Medal has been awarded to 183 students since its inauguration in 1931. The selection of candidates is made solely by the faculty of each school making the award.

BRIDGE DESIGN

The American Institute of Steel Construction has announced another annual bridge design competition (open to bona fide registered students of structural engineering and architecture in recognized technical schools of the United States and its possessions) and offers three cash prizes of $200, $100 and $50 for the designs placed first, second and third.

A jury of nationally known engineers and architects will judge the competition on February 19, 1941. Drawings must be received at the Executive Offices of the American Institute of Steel Construction, 101 Park Avenue, New York City, not later than February 10, 1941.

MAKE THIS TEST — Prove BRIXMENT is BEST!

1 "Cap" one brick with Brixment mortar, and one brick with mortar made with portland cement and lime. After mortars have hardened, place both brick in a pan of shallow water. (Photo 1.) . . .

2 Keep about an inch of water in the pan. Even if soluble salts are present in the brick or sand, you will soon be convinced that *Brixment mortar helps prevent efflorescence.* (Photo 2.)

BRIXMENT *Mortar Helps Prevent* EFFLORESCENCE!

EFFLORESCENCE is an outcropping of minute white crystals on brickwork. When these crystals occur on colored mortar joints, the condition is sometimes mistaken for *fading.*

Efflorescence is caused by the presence of soluble salts in masonry materials. When reached by water, these salts dissolve and are drawn, by evaporation, to the surface of the wall.

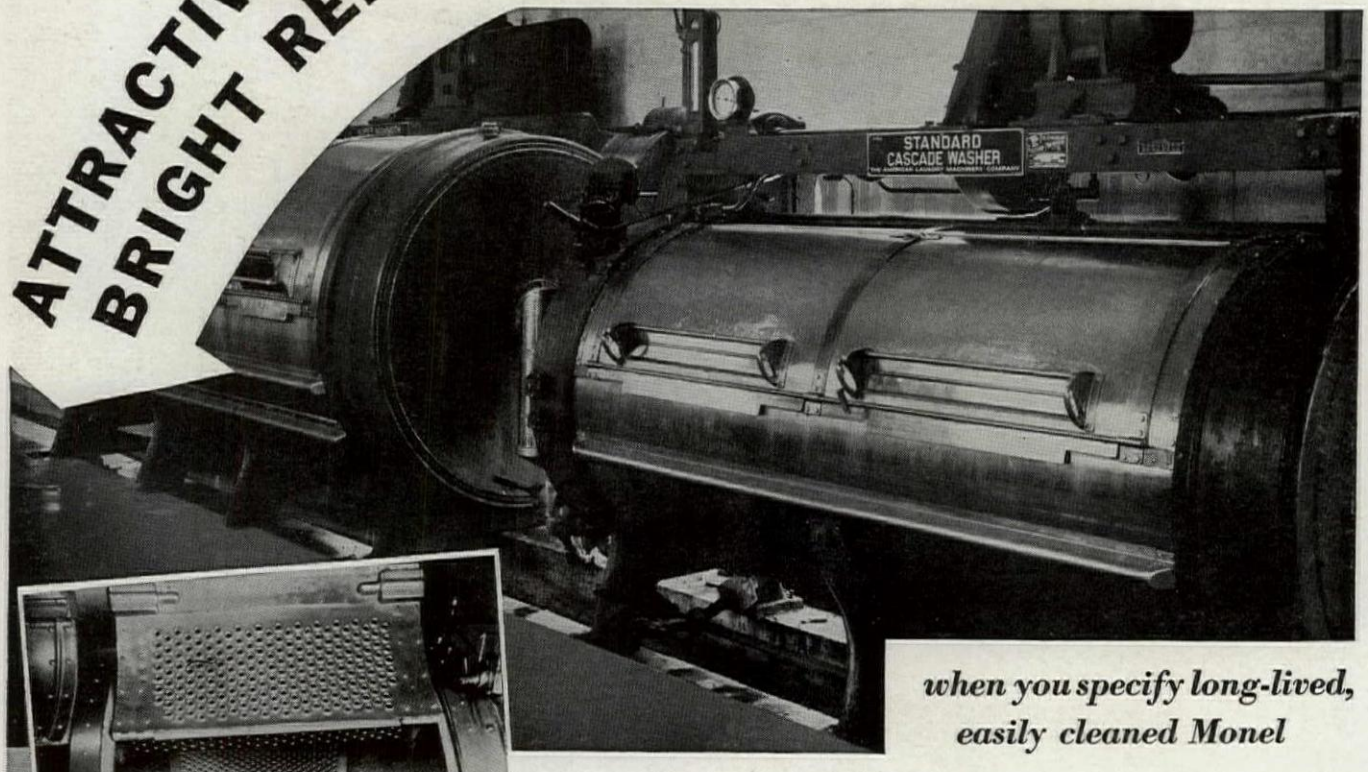
Brixment *never causes efflorescence* because it is practically free from soluble salts. Even when such salts are present in the sand or brick, the waterproofing in Brixment mortar usually *prevents them from coming to the surface.*

Bricklayers who have used Brixment mortar for years say they have *never seen* a case of efflorescence on a Brixment wall. If you have been troubled by efflorescence, we suggest that you *try Brixment.*

BRIXMENT

For Mortar and Stucco

ATTRACTIVE APPEARANCE *for* HOSPITALS
BRIGHT REPUTATION *for* YOU...



when you specify long-lived, easily cleaned Monel

FOR LAUNDRY EQUIPMENT... Important to any hospital laundry are the substantial savings in water, power, soap, supplies and space made possible by Monel washers. So, too, is the improved sanitation and low bacteria count. Furthermore, say wash room managers, linen washed in Monel washers *lasts longer* . . a claim readily understood when you note how smooth and clean is this Monel interior (inset) after *25 years of service.*

FOR KITCHEN WORK SURFACES

For Nurses' Home as well as for hospital specify Monel. Here, too, Nurse wants sanitary, attractive, easily-cleaned equipment. She gets it at small expense to the hospital when you specify a Monel sink and cabinet combination like this one.

FOR FOOD SERVICE EQUIPMENT

One thing even the busiest hospital kitchen cannot afford to sacrifice is sterile cleanliness. Hence the widespread use in this department of Monel. Strong, tough, rust proof and easy to keep clean and attractive, Monel is good for years of service. Furthermore, this silvery metal actually *improves* in appearance with everyday use and cleaning.

Well regarded and long remembered by the Hospital Staff is the architect who specifies Monel. For in scores of hospitals equipment of this lustrous, durable metal is still "like new" after more than a generation of constant use.

Full and helpful information on Monel gladly mailed on request. Address:

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street New York, N. Y.

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.

INCO MONEL

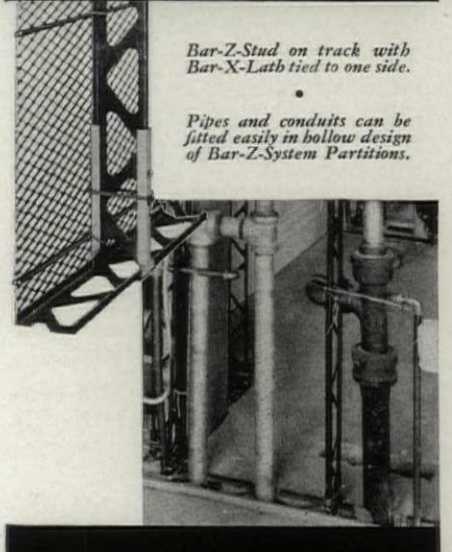
MONEL

For Economical, Firesafe

HOLLOW PLASTERED PARTITIONS

Bar-Z-System used throughout Frances Atherton Girls' Dormitory, Pennsylvania State University, State College, Pa. Architect: Chas. Z. Klauder, Philadelphia, Pa.

Specify Steelcrete BAR-Z-SYSTEM



Bar-Z-Stud on track with Bar-X-Lath tied to one side.

•

Pipes and conduits can be fitted easily in hollow design of Bar-Z-System Partitions.

Rigid, firesafe, non-bearing hollow partitions can be quickly and economically erected with the Steelcrete Bar-Z-System. This consists of Bar-Z-Studs and Bar-X-Lath—the popular Steelcrete diamond mesh expanded metal lath which has twin reinforcing rods for extra stiffness. Bar-Z floor and ceiling tracks are supplied for use with Bar-Z-Studs. The open design simplifies installation of plumbing and conduits as shown in illustration at the left. Bar-X-Lath is tied into position. It provides a perfect keying base for plaster and offers long-lasting protection against cracks. Write for the latest catalog containing complete details.

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THE CONSOLIDATED EXPANDED METAL COMPANIES

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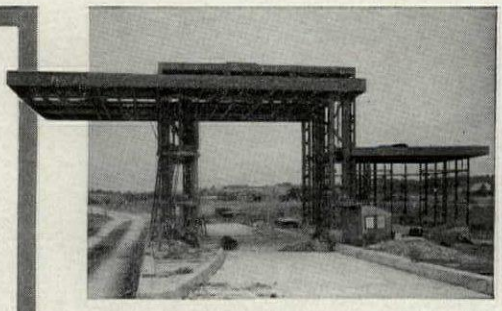
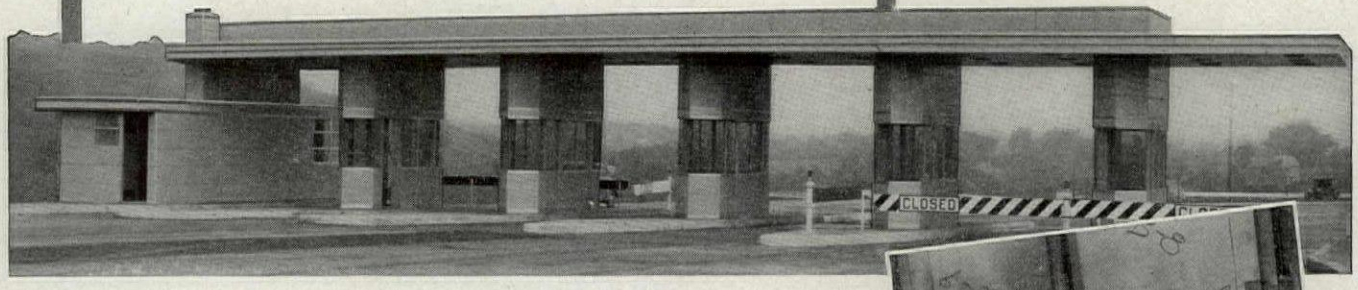
ON THE *"Dream Highway"*

EVEN THE TICKET STATIONS ARE STREAMLINED



ALL TICKET STATIONS *were designed to be uniform by the staff of Captain Gerald R. Tyler, Chief Architect of the Pennsylvania Turnpike Commission. The structural steel framework, fabricated by the Griffith-Custer Steel Company, Johnstown, Pa., is completely sheathed with architectural porcelain enamel. Interior walls are special 18 gage "Paintbond" insulated steel sheets welded to the studs and painted two coats. All construction work, including erection of the porcelain enamel panels, by Moyer Brothers Construction Co., Altoona, Pa.*



and low-cost Porcelain Enamel assures lasting beauty . . . easy maintenance

EVEN the ticket stations on the new Pennsylvania Turnpike convey a sense of speed and efficiency. Their streamlined beauty is characteristic of the functional design of the whole project. And *steel* plays a large part in making their design possible.

All ten stations consist of a structural steel framework, sheathed in colorful Porcelain Enamel on U·S·S VITRENAMEL. Vertical surfaces on the bodies of the buildings are finished in a "pebble finish" light powder blue porcelain enamel, while the canopy soffitt and faces are in ivory with a satin-matte finish. The special surface, developed by the manufacturers, minimizes headlight glare.

There are many reasons why porcelain enamel was the most logical material to use. A material was needed that would be adaptable to the architectural design, have a high degree of permanence when exposed to the weather, and require little maintenance to keep clean and in good condition. Porcelain enamel has all these qualifications and more. Because the metal base is inexpensively formed, any design is easily reproduced at low cost. Because porcelain enamel is actually glass fused on metal, it makes a permanent job. And cleaning involves no more than wiping with a damp cloth. In addition the initial cost of porcelain enamel is low—it costs less to erect.

To be sure of quality work, always specify the base metal. U·S·S VITRENAMEL Sheets are specially made for porcelain enameling. They are uniformly flat and have the necessary ductility which makes shaping easy. Their prepared surface assures better enameling.

THE ENAMEL PRODUCTS CO. *of Cleveland, Ohio, deserves credit for the unique design of the panels. They are fastened direct to the structural steel frame of the building through 14 gage steel sheets. Panels are 1" in depth, formed from 18 gage U·S·S* VITRENAMEL *Sheets, and having a special flange design which acts as a water seal. Insulation is provided by ¾" pulp board cemented to the exterior enameled steel panels and the interior sheathing sheets at the factory. The ingenious design of the panels permits any necessary replacements to be made easily and quickly. The sheets were formed and enameled by the Ingram-Richardson Manufacturing Co. of Beaver Falls, Pa.*

U·S·S VITRENAMEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION

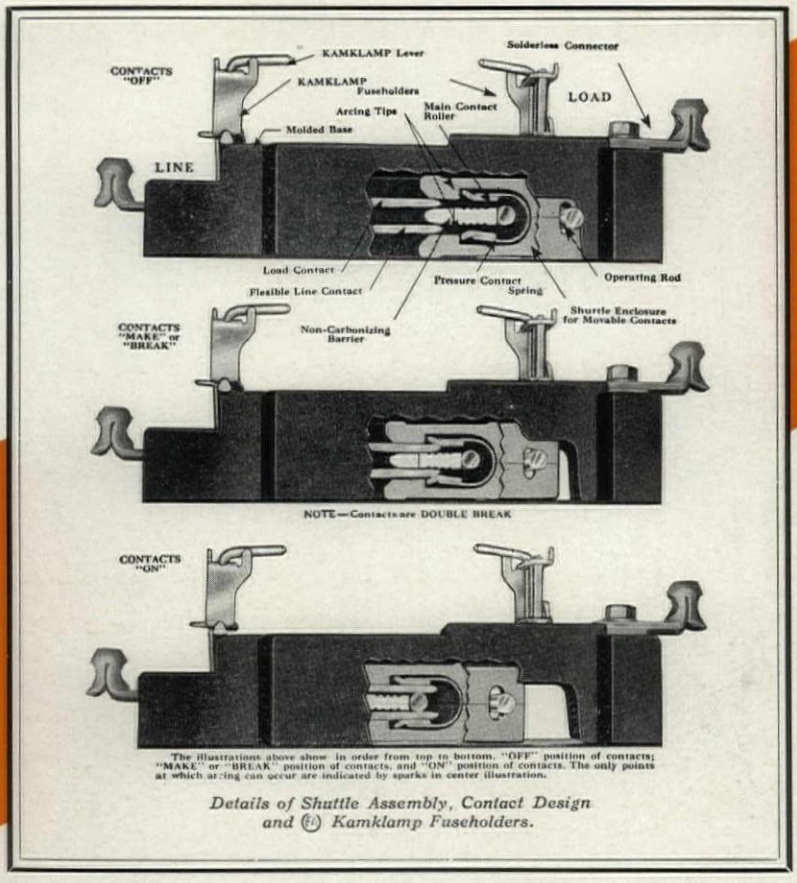
Pittsburgh · Chicago

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

UNITED STATES STEEL

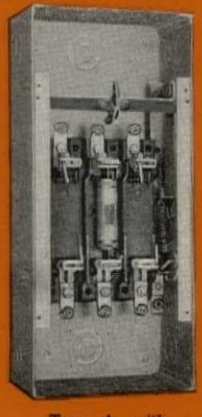
Something New...

in an ENCLOSED SAFETY SWITCH

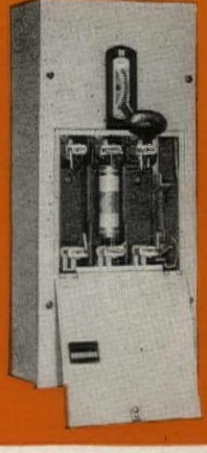


Details of Shuttle Assembly, Contact Design and (FA) Kamklamp Fuseholders.

Type A, in ON position; door interlocked with handle — fuses not accessible when ON.



Type A, with front removed.



Type B, in OFF position; non-interlocking door — fuses accessible in either ON or OFF position.

Here is a front-operated safety switch which embodies *entirely new ideas in both design and construction.*

The (FA) Shutlbrak Enclosed Switch is a high quality, heavy duty industrial switch for motor control, service entrance, and other disconnect installations. Its quick make and break connections are *held under compression.* It is equipped with Kamklamp fuseholders for either the ferrule or knife-blade types of fuse terminals.

The line and load connections are enclosed in the completely insulated shuttle, which contains the movable contacts — the auxiliary contacts on the ends of the compression spring, and the main contact roller. There is an arc-resisting barrier between the line and load contacts *at all times.*

The switchbox has ample room at top, bottom and *behind* the switch unit for wiring and connecting space.

The (FA) Shutlbrak Switch is available either with or without an interlocking arrangement between the operating switch lever and the door of the fuse compartment. It may be had for either surface or flush mounting.

Capacities at present: 30 to 200 amp., inclusive, for 250 volts AC or DC, and 575 volts AC, in 2, 3 and 4 poles. (Larger capacities in preparation.) Each switch is rated in horsepower. Approved by Underwriters' Laboratories as an Enclosed Switch.

The (FA) One-Piece Panel Switchboard When (FA) Shutlbrak Switches are mounted for switchboard assembly, each steel panel is self-contained, with all of the switch units connected to the branch bus bars of that section. These branch bars are connected to a vertical set of bus bars, which are in turn connected to horizontal bus bars. The latter are supported at either top or bottom, whichever is most convenient to connect the service entrance cables.

The new design (FA) Shutlbrak Switch Switchboard is furnished individually enclosed, with a junction box built into the top of each panel.

For more Complete Information write for Bulletin No. 59; also for *new* Catalog No. 56 . . . Frank Adam Electric Company, St. Louis, Mo.

EST. 1891 THE SIGN OF A BETTER JOB

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We know how you've felt about it and we, too, have done some tossing and turning. But with a company such as ours making something like 30,000 different electrical products, it's pretty difficult preventing our various division representatives stepping on each other's heels in their eagerness to keep you posted on latest developments.

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Here's the story briefly. Starting immediately, a Westinghouse representative will be delegated to serve your office.

Behind this contact man is a fully equipped, fast-action clearing house. From this centralized source you can obtain quickly all the information you want about Westinghouse products, supplies and services related to the building field.

In constant touch with this clearing house is a staff of product specialists readily available whenever you need them.

We believe you're going to like this new arrangement even though we have only high-spotted its advantages. You'll get the complete story when our representative calls. Meanwhile, if you want to see how responsive, thorough, helpful this Clearing House Service is, just pick up the phone and call your nearest local Westinghouse district office.

Westinghouse

CLEARING HOUSE SERVICE

FOR ARCHITECTS AND BUILDERS

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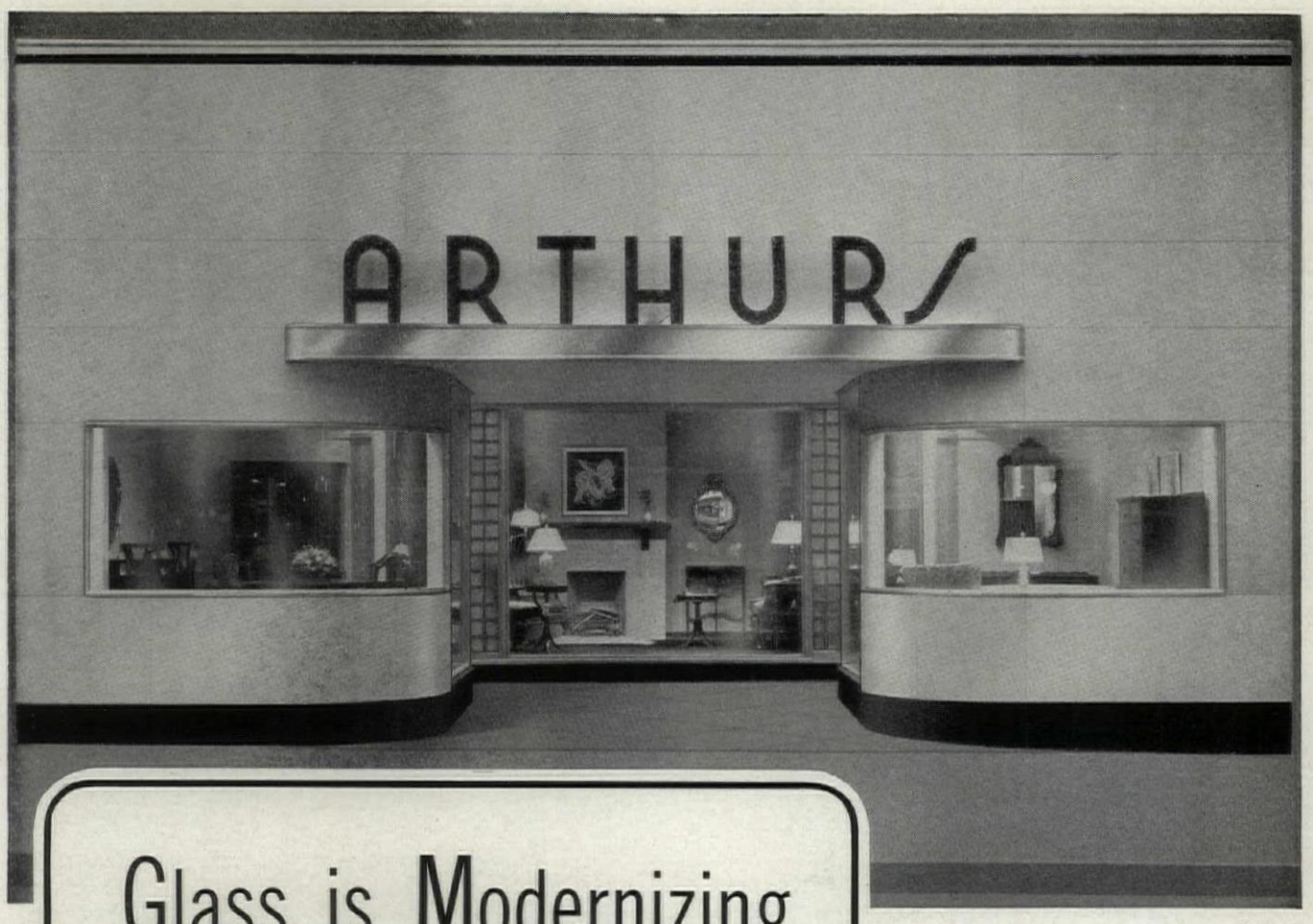
WESTINGHOUSE ELECTRIC



Glass is Modernizing Main Street

PERSONALITY, STYLE, SALES APPEAL! *Glass gives them all to this handsome Pittco Store Front in Decatur, Ill., designed by Engineering Service Corporation. This is a fine example of the versatility of glass in store front design. Note the attractive PC Glass Blocks which flank the center show window.*

by bringing new beauty and versatility to store front design

THERE is a kind of glass in the Pittco line to meet every store front need. Polished and Suede-finish Carrara Structural Glass, PC Glass Blocks and Architectural Glass, Pittsburgh Plate Glass, Herculite Tempered Plate Glass, Tapestry Glass, Pittsburgh Mirrors... these are some of the glass products which have widened the scope of design and helped architects to make Main Street modern.

All these Pittco Products are of high quality. All are meant to be used together to create harmonious, unified store fronts. And all of them can be readily obtained in identical quality anywhere in the country.

In *your* store front work, call on the versatility of glass to help you create striking, original fronts that get action for your clients. Mail the coupon now for more detailed information about Pittco Store Front Products and for graphic examples of the magic of glass in modernizing Main Street.

At the New York World's Fair, see the miniature Pittco Store Fronts in the Glass Center Building, and the full-size Pittco Fronts of the Avenue of Tomorrow in the Forward March of America Building.

PITTCO STORE FRONTS

PITTSBURGH PLATE GLASS COMPANY

"PITTSBURGH" stands for Quality Glass

Pittsburgh Plate Glass Company
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Please send me, without obligation, your new book entitled "How to Get More Business."

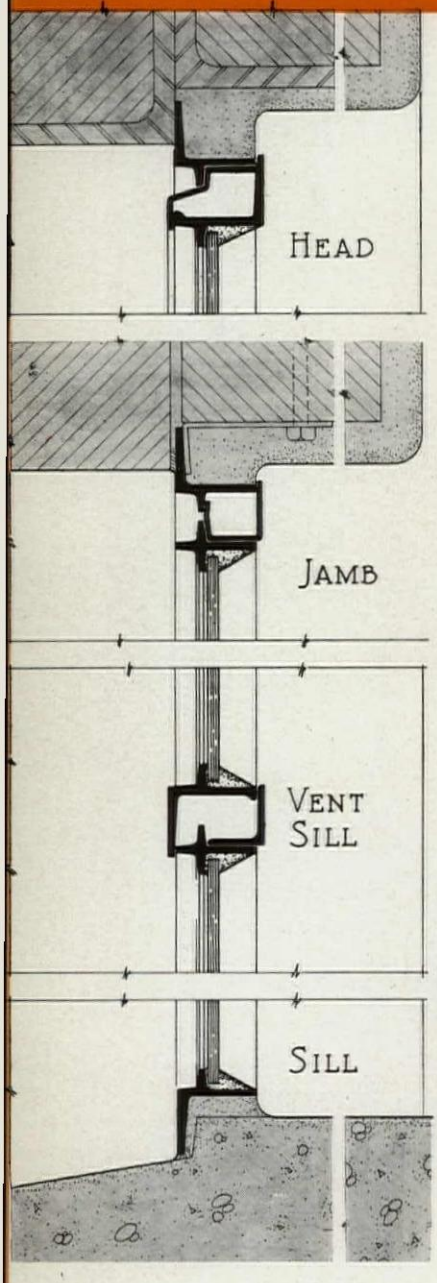
Name.....

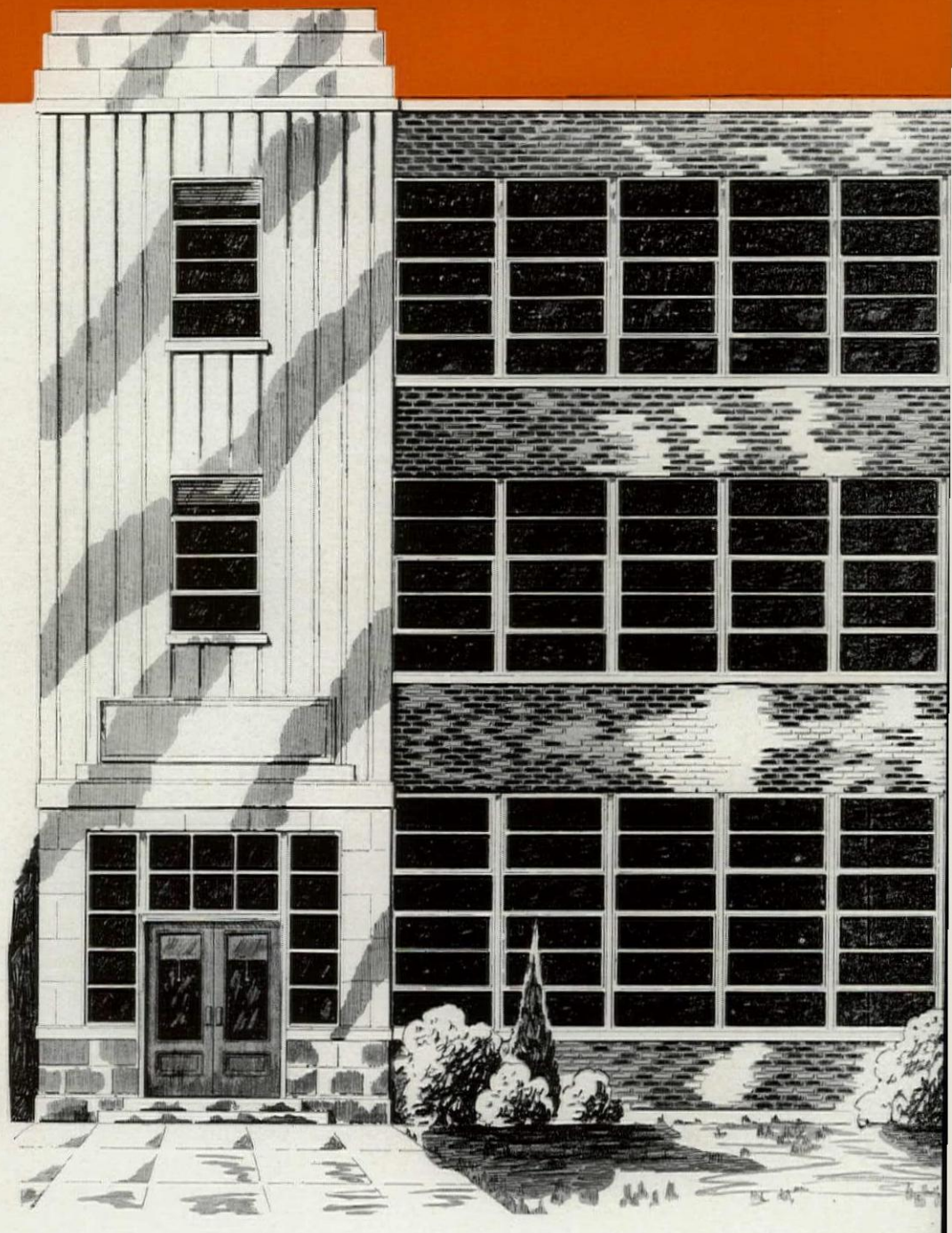
Address.....

City.....State.....

"Mobilized" for Immediate Use!

TRUSCON HORIZONTALLY PIVOTED STEEL WINDOWS





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Available with or without vertical muntin bars, TRUSCON HORIZONTALLY PIVOTED WINDOWS meet every design requirement of the architect's plan. Refer to TRUSCON'S 80-page catalog in "Sweet's" for specifications and scale drawings of the various types and sizes or write for your copy of our new catalog featuring pivoted windows, mechanical operators and industrial doors.

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VOLUME XXI NUMBER 10 OCTOBER, 1940

ARTICLES

PLATES

THE MONOGRAPH SERIES

VOLUME XXVI, NUMBER 5

THE THRESHING FLOOR

DATA SHEETS PREPARED BY *DON GRAF*

HERE, THERE, THIS, AND THAT

COVER DESIGN AND TYPOGRAPHY BY *GUSTAV JENSEN*

PENCIL POINTS

KENNETH REID, EDITOR. CHARLES MAGRUDER, MANAGING EDITOR
DON GRAF, TECHNICAL EDITOR

THE MONOGRAPH SERIES
RUSSELL F. WHITEHEAD, EDITOR

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WHAT ARE WE WAITING FOR?

A GUEST EDITORIAL BY ARTHUR C. HOLDEN

Many able men needed for the defense program have not yet been able to swing into their stride because they have been waiting for instructions from Washington, from *someone* at the top who is to tell them exactly what to do. What sort of housing is needed? Where? Who is to pay for it?

In a democratic nation where a Federal system prevails, there must be co-ordination between Federal, State, and local government and between government and enterprise. Co-ordination requires the dovetailing of decisions and services for which the central government is responsible into decisions and actions which must be taken locally.

What is expected of Washington is information expressed in terms precise enough to indicate what sort of dovetailing of effort is required. In the first place, there should be the specific designation of defense areas which are already equipped to do certain definite tasks. Let these areas be designated and their tasks assigned.

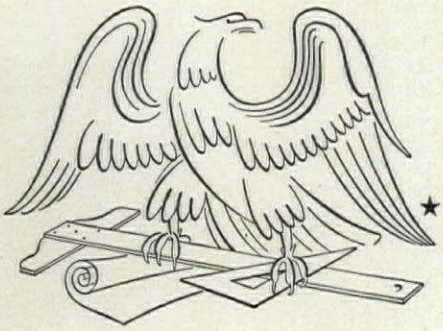
In the second place, there will be expansion of capacity into new areas. It may be wise to locate a reasonable proportion of additional facilities at points away from the seaboard. If so, let the intent be clarified and some idea given of productive effort expected.

Looked at from the other side, there is a need for immediate self-examination on the part of all areas eligible for defense contracts. There is no reason for an area with the metals manufacturing capacity of Connecticut to wait for a magic word or the assignment of specific contracts from Washington before action is taken. Each locality should be able through its leading industrialists, commercial, labor, and real estate interests, to express definitely its capacity to serve the defense program.

Already reconnaissance reports have been made for some specific defense areas as, for example, the report of the Philadelphia Housing Association on "Housing and Defense" for that area. In this report there is given a survey of the orders that have already come to the district as well as data on increased employment, available labor supply, and its relation to a housing program. A reconnaissance report has been made in connection with the work of the Twentieth Century Fund for the Hampton Roads region, giving the expected expansion on account of the United States Naval Training Station and the Norfolk Navy Yard and the additional contracts to be awarded to the Newport News Shipbuilding Company. The report deals with methods for providing indicated additional houses. Uncertainties as to the plant capacity, labor supply, and housing requirements of the various defense areas might be dispelled by deliberate organization for the exchange of information. Washington could help matters by drawing up and sending intelligently-framed questionnaires to local real estate boards, local organizations representing the building industry, local financial interests, local industrial interests, and representatives of labor and the public.

The greatest good could be served by far more open dealing between Washington and the localities. The exchange of information should be a guide to the type of directional action that must be taken in Washington, as well as a guide to activation in the locality. Actual military secrets are something to be held in confidence after the letting of contracts. During the preliminary stages of work assignment, secrecy is too often a mere protective cloak with which minor government officials, who are unable to make decisions, turn aside the over-eager advances of industrialists and business men.

The time has come when both government and industry should speak out, in order to make clear what they expect of one another.



The Architect's Place in the Preparedness Program

III - AIRPORTS

LOCATION OF NEW WASHINGTON NATIONAL AIR TERMINAL

THE TERMINAL BUILDING AT WASHINGTON NATIONAL AIRPORT, AS IT WILL APPEAR FROM THE FIELD SIDE, SHOWN BY MEANS OF AN ACCURATE SCALE MODEL. ALMOST CONTINUOUS GLAZING IS SO ARRANGED AS TO INSURE UNOBSTRUCTED VIEWS OF THE FIELD FROM PRACTICALLY EVERY PART OF THE INTERIOR

THE WASHINGTON NATIONAL AIRPORT

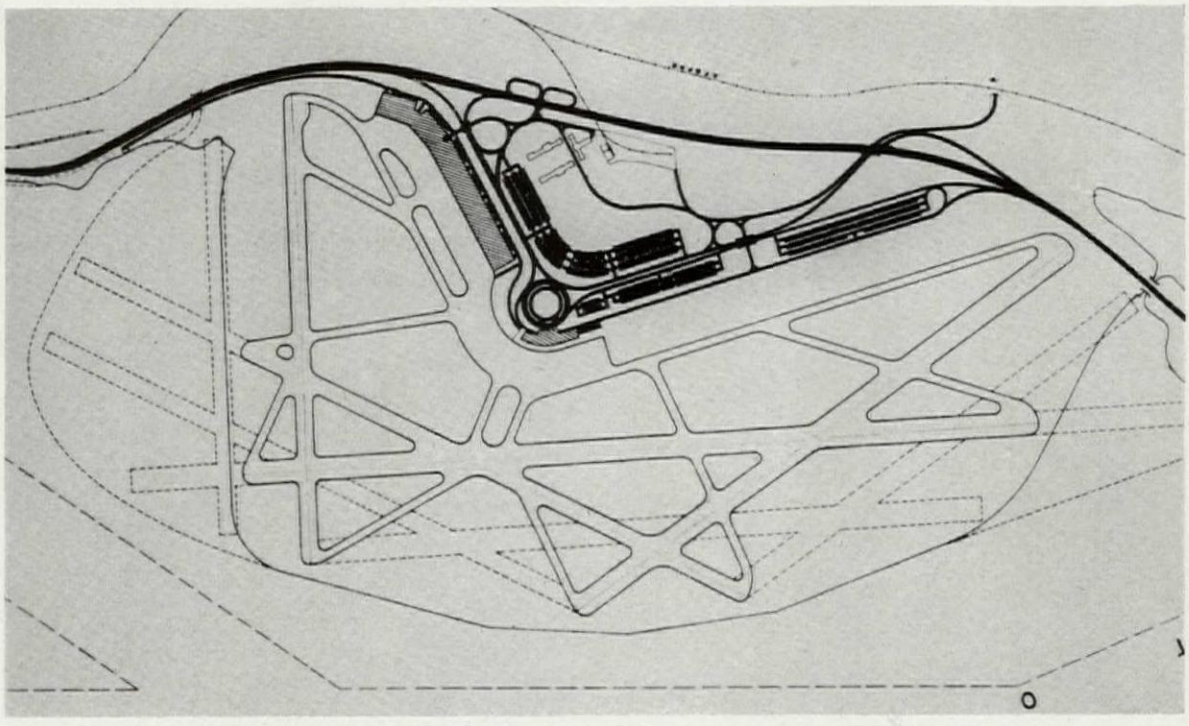
BY JOHN STUART

Under the able guidance of *Colonel Sumpter Smith* of the Civil Aeronautics Authority, who is Chairman of the Interdepartmental Engineering Commission in direct charge of the design and construction of the new Washington National Airport, the CAA project begun in November 1938 is rapidly nearing completion. Members of the Commission, other than Colonel Smith, are *Colonel R. S. Thomas*, District Engineer of the Corps of Engineers, U. S. Army; *W. Engelbert Reynolds*, Commissioner of Public Buildings, Public Buildings Administration; *Fred E. Schnepfe*, Director of the Federal Projects Division of PBA; and *Major B. M. Harloe*, Assistant Commissioner and Safety Engineer of the Works Progress Administration.

H. H. Houk of the Civil Aeronautics Authority is the Resident Engineer in charge and *Howard Lovewell Cheney* is the Consulting Architect directly responsible for the planning and design of all building structures being erected on the site by the PBA. The Landscape Architect is *Henry N. Boucher* of the PBA, assisted by *S. E. Sanders* of the same organization.

The result of the labors of these men and all those associated with them promises to be the finest metropolitan air terminal in the world, considered both technically and aesthetically. Through careful study of all earlier international experience with airport design and operation the designers were enabled to incorporate into the project the best features of the world's most modern terminals. By the exercise of their own ingenuity they have added to these a number of improvements which contribute substantially to the advancement of the art and science of airport design.

The flying field itself has many advantages over others in this country. Approaches may be made to any runway at a gliding angle as shallow as 40 to 1, providing twice the safety factor in this respect as compared with the prevailing condition at most airports where 20 to 1 has been considered a sufficiently small angle. From most directions the approaches will be made over water.



THE ABOVE DRAWING SHOWS THE PLAN FOR FUTURE EXPANSION OF THE WASHINGTON NATIONAL AIRPORT, THE DOTTED LINES INDICATING ULTIMATE EXTENSION OF RUNWAYS WHICH WILL CALL FOR ADDITIONAL FILL TO THE NORTH AND SOUTH. THE RETOUCHED PHOTOGRAPH BELOW SHOWS ITS RELATION TO THE PROJECTED SEAPLANE BASE WHICH APPEARS IN THE FOREGROUND, ALSO ADJOINING THE MOUNT VERNON MEMORIAL PARKWAY. THIS PHOTOGRAPH SHOWS ALSO HOW THE PANORAMA OF WASHINGTON, ACROSS THE RIVER, EXTENDING FROM THE CATHEDRAL AROUND TO THE NAVY YARD, WILL BE SPREAD OUT BEFORE THE EYES OF OBSERVERS ON THE TERRACES OF THE AIRPORT'S ADMINISTRATION BUILDING

Photos by Charles Ackley

Four runways are provided, the shortest of which is longer than the longest at the old Washington Airport. Runway sizes are as follows: North-South, 6,875 feet long, 200 feet wide; Northwest-Southeast, 5,300 feet long, 200 feet wide; Northeast-Southwest, 4,820 feet long, 150 feet wide; East-West, 4,200 feet long, 150 feet wide. The two longest, in the direction of the prevailing winds, will take care of 70% of the traffic. Future expansion has been planned for as shown opposite.

The Terminal building and hangars are contemporary in design spirit, functional and appropriate in form to the modern mode of transportation they serve. Evolved through a long series of studies, Mr. Cheney's final design was approved in model form by more than twelve federal agencies directly or indirectly concerned, including both the National Capital Park and Planning Commission and the Commission of Fine Arts.

Public entrance to the terminal building is from the west, passengers and visitors arriving at a large circular plaza whence they pass under protecting canopies to either of two doorways leading into the waiting room at a level one story above the field. Sightseers will normally be directed from the plaza across the footbridges at either end of the building to the observation terrace extending, at a level several steps lower, the length of its field side. Here they will be able to see the arrival and departure of all planes without interfering in any way with passenger traffic or with views from within the building.

Along the west wall of the two-story-high waiting room are located the ticket offices and counters, to be occupied for the immediate future at least by three airlines—Eastern, American, and Pennsylvania-Central. The east wall of this room, toward the field, is all of glass, an expanse 200 feet long through which people inside may see the major portion of the field.

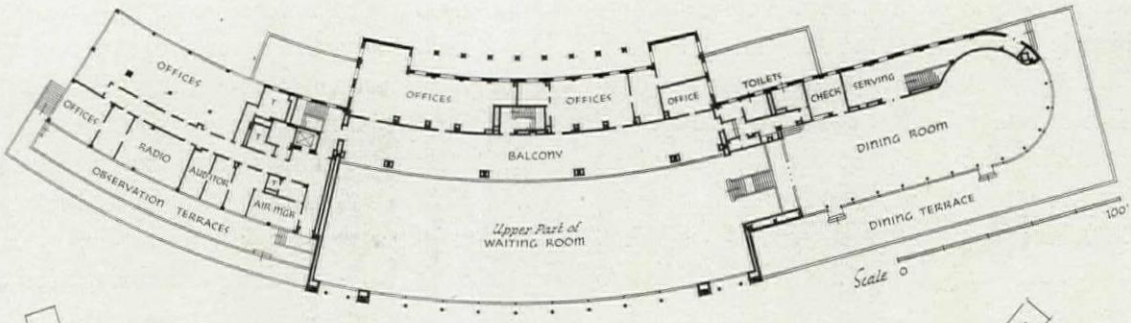
Along the field side of the waiting room, and inside the window, the floor level is several steps lower for a width of about 15 feet. This lower level continues out to the passenger concourse which extends north and south the full length of the building, a total of 540 feet. From the concourse, stairs at four points lead down to the ground level loading stations. Circulation of passengers from ticket offices to concourse to loading stations and planes is thus easy and direct. In anticipation of future growth of traffic, loading ramps of two level design are being studied. These will provide for ground level loading of present types of planes plus high level loadings from the passenger concourse to the newer tricycle landing gear planes which have loading doors as high as ten feet above the ground.

Initially, there are to be fourteen loading stations. Passenger concourses are so arranged, however, that they can be extended in future to the south for 500 feet and to the north for a quarter of a mile or more, which will provide for all reasonably anticipated growth.

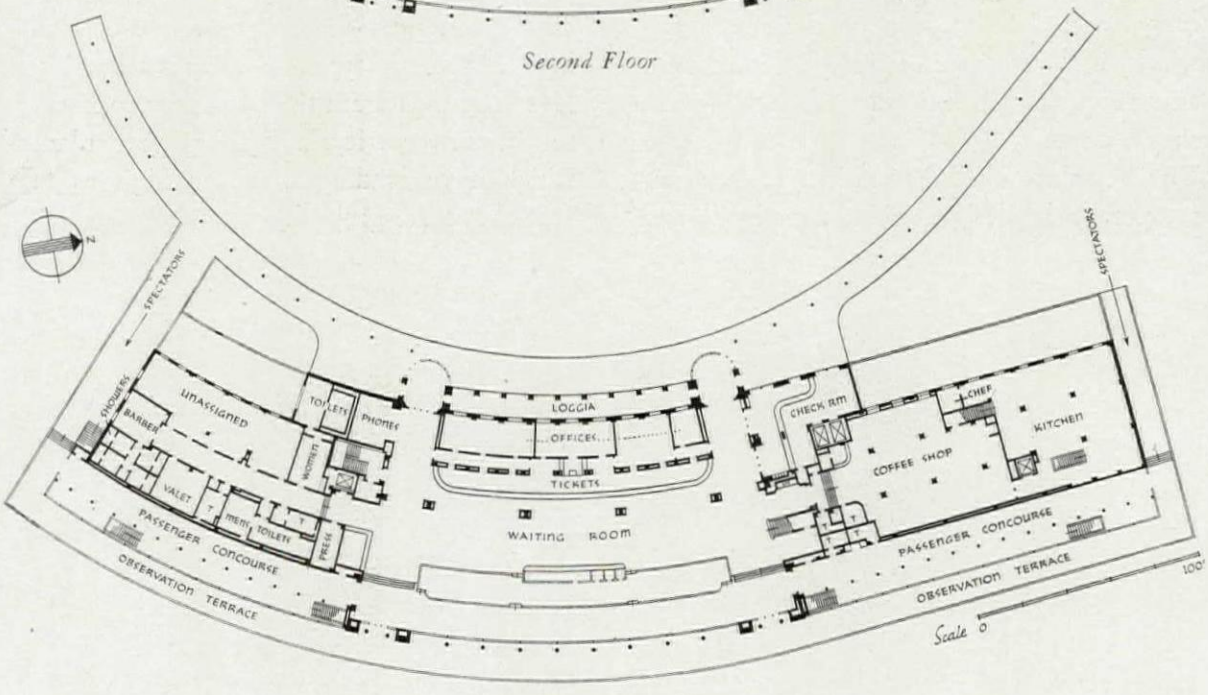
At each plane loading station, service pits will be installed to house outlets for telephone, pneumatic tube, air-conditioning, and gasoline, thereby eliminating need for mobile service trucks on the field. Turntables at each station will make possible easy manoeuvering of even the largest planes.

To the south of the waiting room on the first floor are grouped various public conveniences while to the north a large coffee shop (down a few steps) and a spacious dining room (up a short flight) are available to handle the problem of adequately feeding the great numbers of visitors expected. The dining room, continuously glazed along the side and end towards the field and towards Washington, will command a magnificent view. Its broad outdoor terrace, several steps lower, provides accommodation for open air diners without interfering with the view from tables inside. Together, these facilities will very likely come to be the most popular mealtime rendezvous of the whole Washington region.

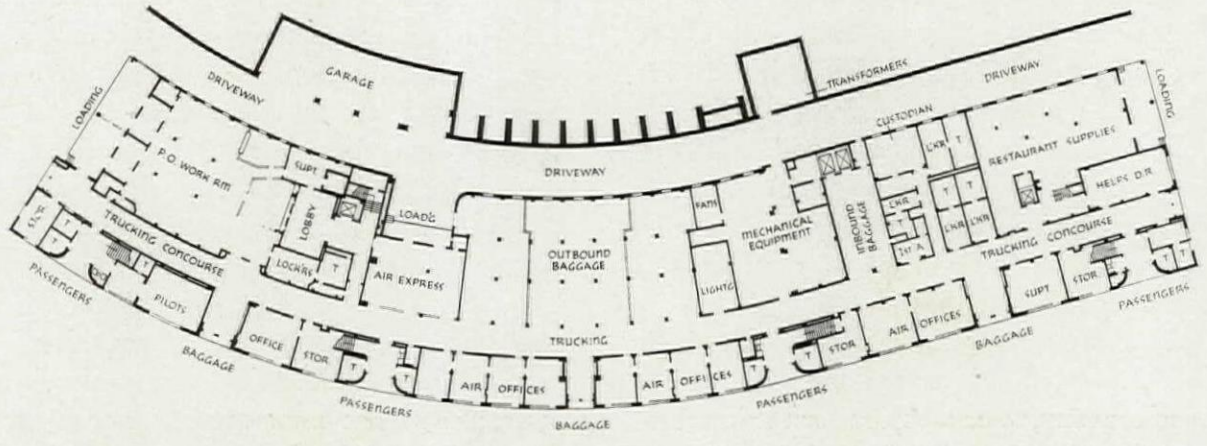
On the second floor also is a broad balcony, extending along the west wall of the waiting room and giving access to a group of airline offices. The south wing of this floor is devoted to the airport manager's suite and additional airline office space.



Second Floor

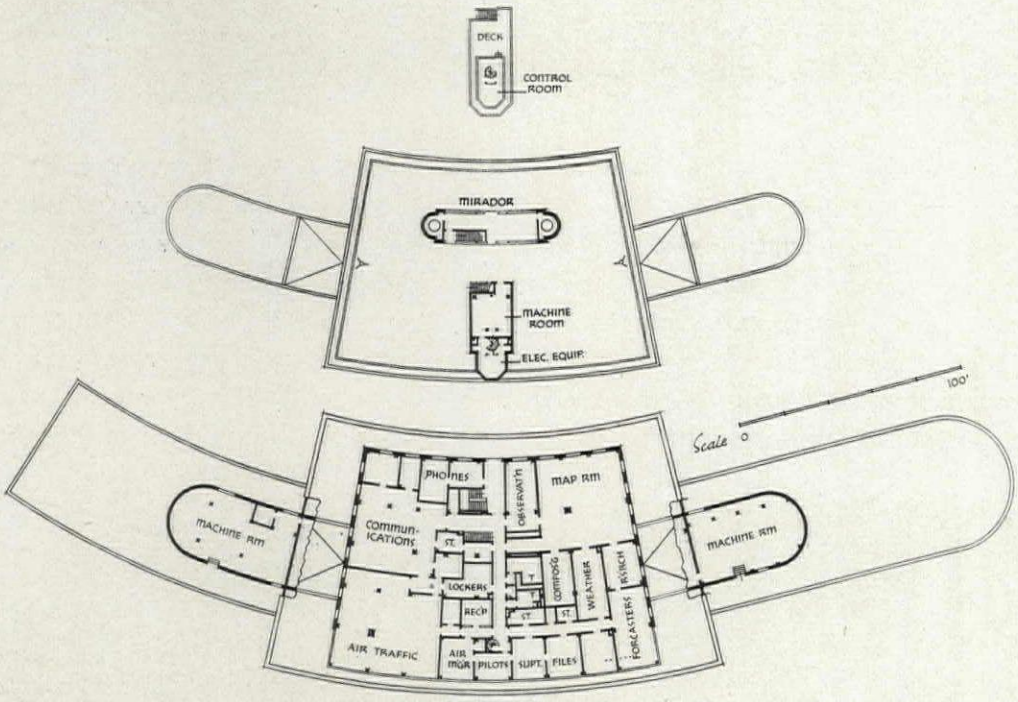


First Floor

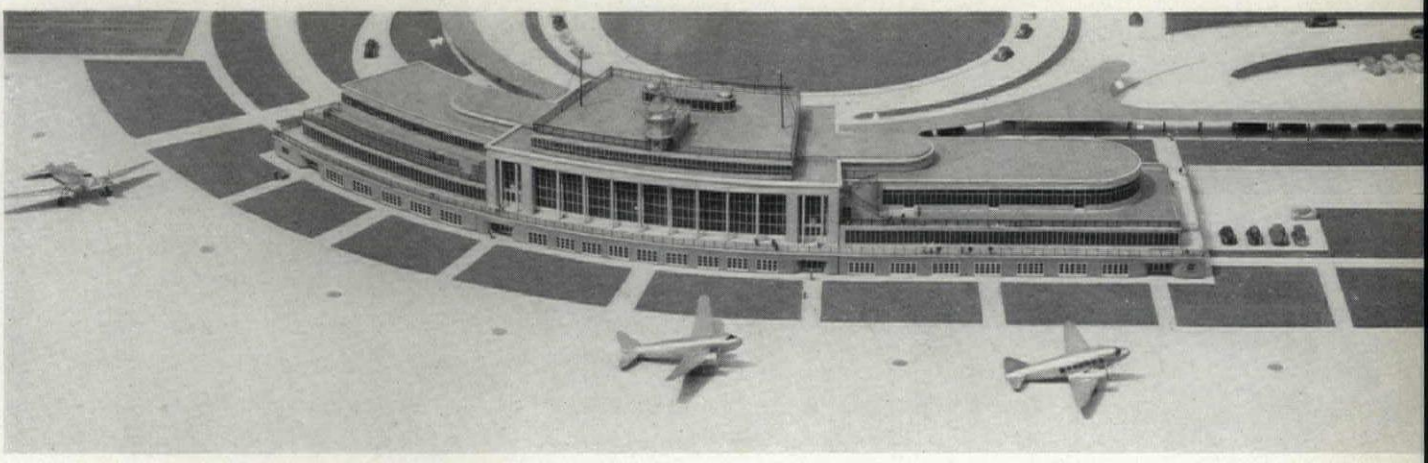


Ground Floor

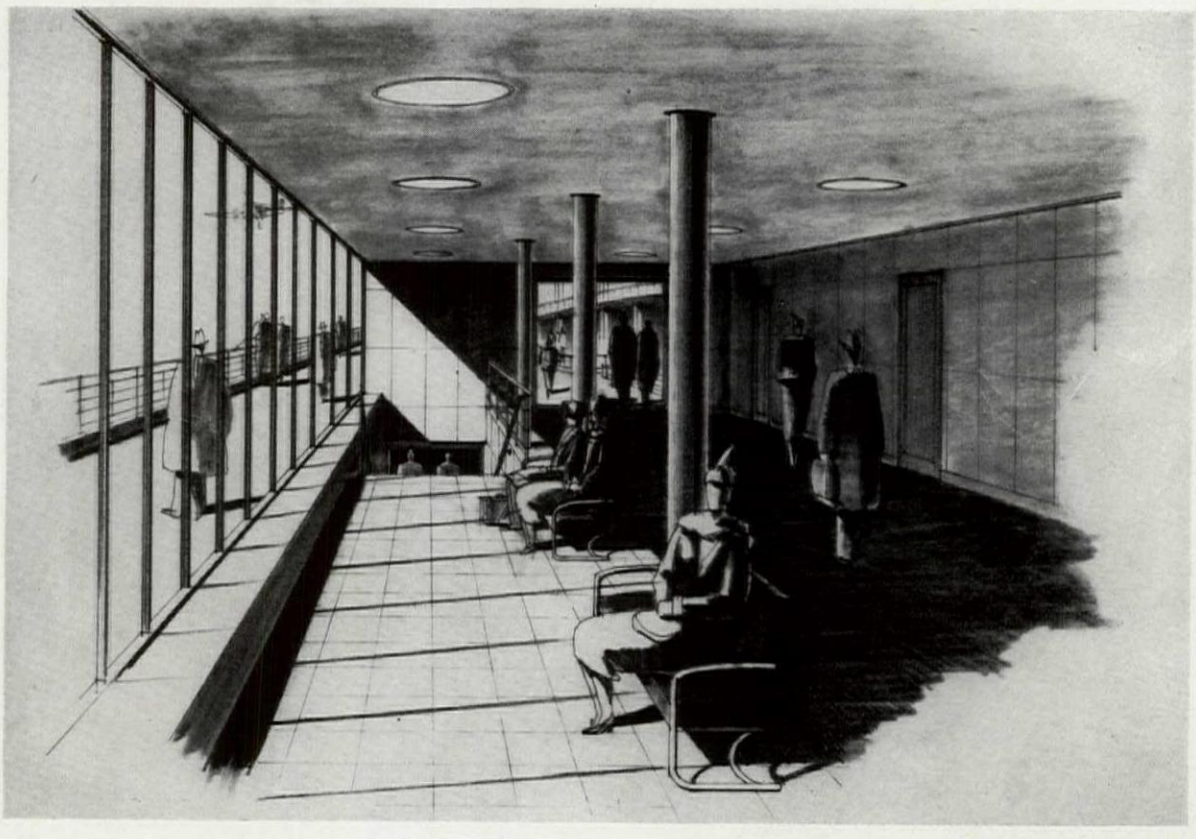
THE GREAT TERMINAL BUILDING OF THE WASHINGTON NATIONAL AIRPORT IS SHOWN HERE BY TWO VIEWS OF THE SCALE MODEL AND BY THE FLOOR PLANS. ATTENTION IS CALLED TO THE PUBLIC OBSERVATION TERRACE APPROACHED ACROSS FOOT BRIDGES FROM THE TRAFFIC CIRCLE AND EXTENDING COMPLETELY AROUND THE FIELD SIDE OF THE BUILDING WITHOUT CROSSING THE PATH OF INCOMING OR OUTGOING PASSENGERS, GIVING SIGHTSEERS AN UNOBSTRUCTED VIEW OF THE ENTIRE FIELD. NOTE ALSO THE DINING TERRACE OUTSIDE THE RESTAURANT, WHICH IS SEVERAL STEPS BELOW THE RESTAURANT ITSELF



Third Floor and Control Tower



THE SKETCH ABOVE SHOWS THE GREAT WAITING ROOM INTERIOR OF THE WASHINGTON NATIONAL AIRPORT, THE VIEW BEING TAKEN TOWARDS THE STAIRS LEADING UP TO THE RESTAURANT. THE SIDE OF THE ROOM TOWARDS THE FIELD IS ALMOST COMPLETELY GLASS, GIVING A CLEAR VIEW OF ALL OPERATIONS. THE PASSENGER CONCOURSE, RUNNING ALONG INSIDE THIS GLASS, AND THE PUBLIC OBSERVATION TERRACE OUTSIDE IT ARE SEVERAL STEPS LOWER THAN THE MAIN WAITING ROOM FLOOR, ENABLING PEOPLE TO LOOK OVER THE HEADS OF THOSE BETWEEN THEM AND THE FIELD. THE TREATMENT OF THE PASSENGER CONCOURSE, WHICH EXTENDS NORTH AND SOUTH OF THE WAITING ROOM, WITH THE OBSERVATION TERRACE OUTSIDE IT, IS SHOWN IN THE SKETCH BELOW. STAIRS GO DOWN TO LOADING STATIONS



The third floor will house a large Weather Bureau staff, the Civil Aeronautics Airway Traffic Control, and Communications offices. Above this story will be the glass-enclosed control tower of most advanced design which will give a clear, unobstructed view of every portion of the landing area and aprons as well as of the entire 360 degrees of sky.

The ground floor is devoted entirely to service facilities. Outbound baggage rooms for each airline receive baggage which is chuted down from the ticket offices above after it has been weighed and tagged. At the south end, the post office department has ample facilities for receiving and handling mail. Air express has a separate loading platform and work space next to the baggage rooms. Mechanical services, employees' conveniences, kitchen service, storage and receiving rooms, and an employees' cafeteria are at the north end of the ground floor.

Extending the full length of the building on its west side is a wide and continuous motor driveway for trucks and deliveries. Also running the full length, just west of the offices that adjoin the field side at the ground level, is a trucking concourse for hand or electric trucks which transfer mail, express, and baggage to and from planes. Note that there is no interference by these trucks with the course of passengers at loading gates.

Incoming baggage from planes is handled up from the ground level receiving room by elevators which deposit it at the check room just north of the waiting room near the doorway out to the traffic circle. Passengers on their way out to cabs, buses, or autos can pick their bags up with no waste motion.

Along the field side of the ground floor are located the offices of the dispatchers and crews of the airlines, offices for the airport superintendent, and airline equipment rooms. A pilots' clubroom is also provided. The four passenger entrances along the field side have convenient public telephones, toilets, and lobbies.

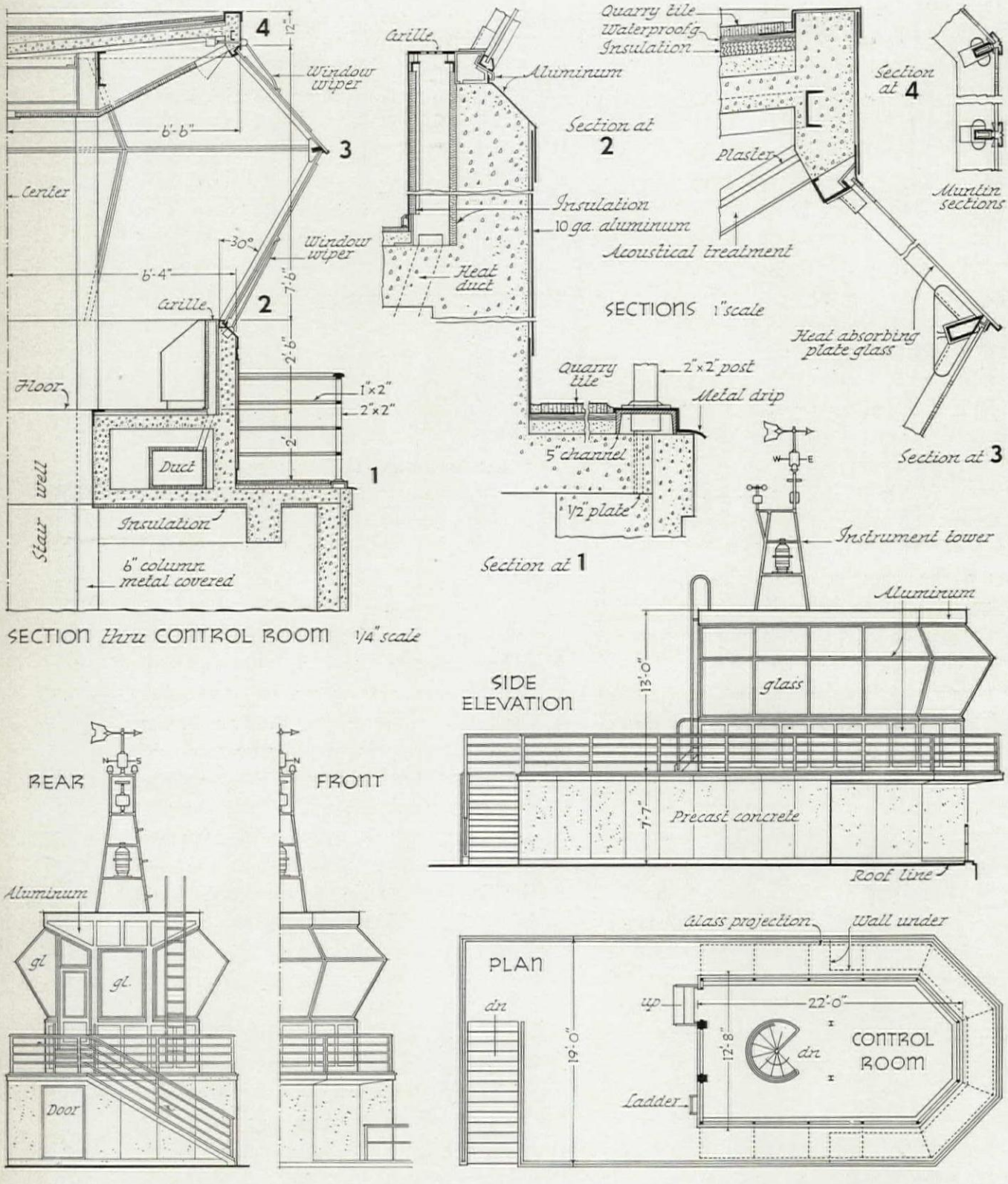
Throughout the building, the latest and best equipment of every type has been called for. Air-conditioning is being provided in the waiting room, passenger concourse, coffee shop, dining room, offices, and control tower. The building is of reinforced concrete and completely protected against fire.

The Washington National Airport is one of the first projects of its kind in which specialists in "land use design" have worked collaboratively with architects and engineers in the adaptation of the site to its intended function. The site has consequently been studied from a somewhat different point of view than that of a purely engineering development. The alignment of the roadways, the profiles of the roadways, the design of parking areas, the moulding and grading of the land, the location of future buildings, the elimination of grade crossings, and the general unification of all these factors have been, as a result, skilfully coordinated to take fullest advantage of the site in adapting it to the purposes of the project.

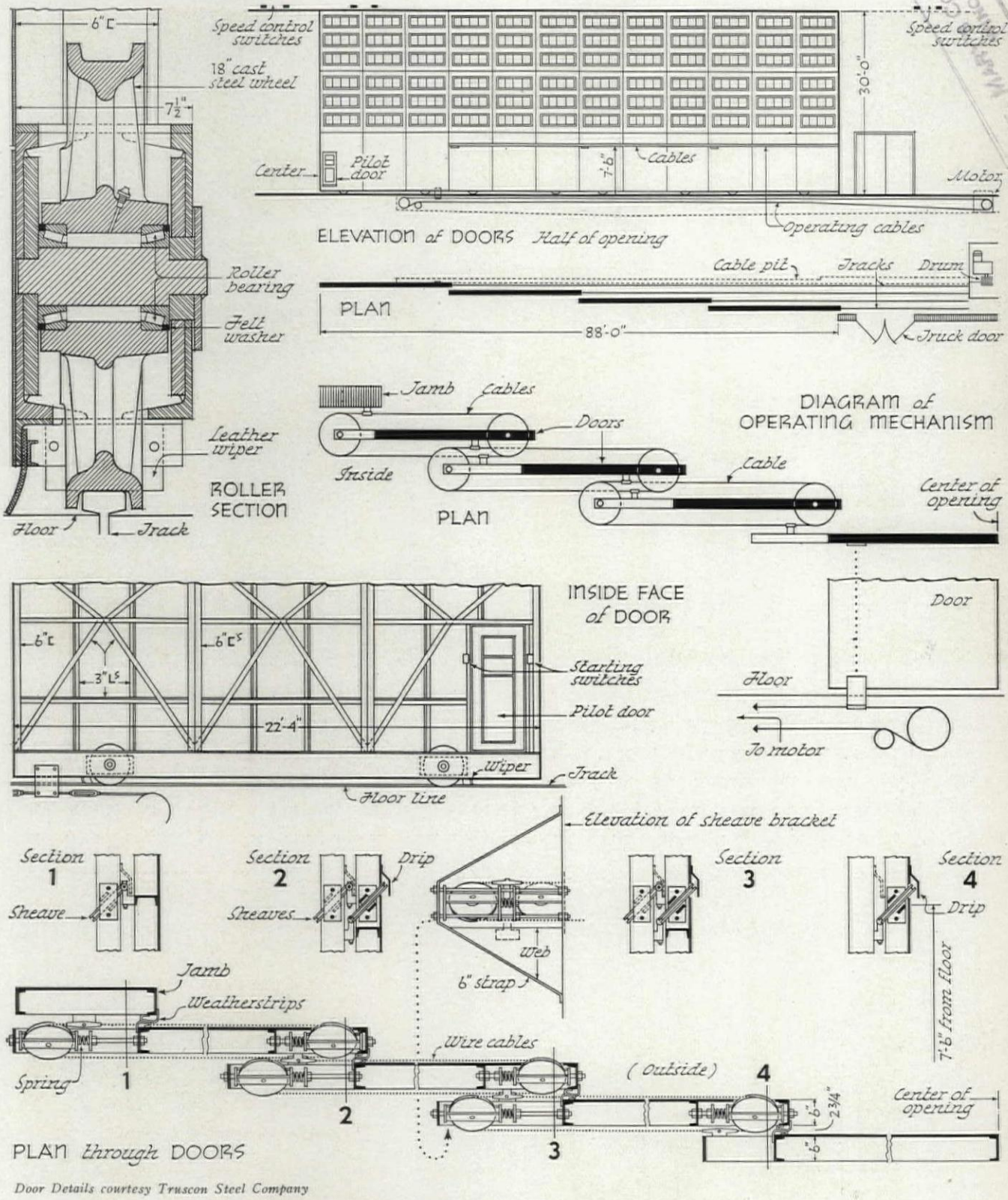
The site adjoins the Mount Vernon Memorial Parkway, 3½ miles from the center of Washington. It thus takes advantage of the most desirable traffic route to the various government offices and the business district. The landing area comprises 556 acres, largely hydraulic fill, and the area devoted to buildings, approaches, parking, etc., consists of 173 acres, formerly the river bank of uneven topography. The hilly character of this part of the site was used to advantage in arranging the approaches to the Terminal Building and in the disposition of field observation parking. The rotary and approach roads are about 15 feet above the landing field level, allowing ample room for underpasses and terracing.

Robert H. Hinckley, former Chairman of the Civil Aeronautics Authority, now Assistant Secretary of Commerce, recently stated: "This airport was conceived as much more than a service to the Nation's Capital City. It was conceived as a model for what other such terminals may be.

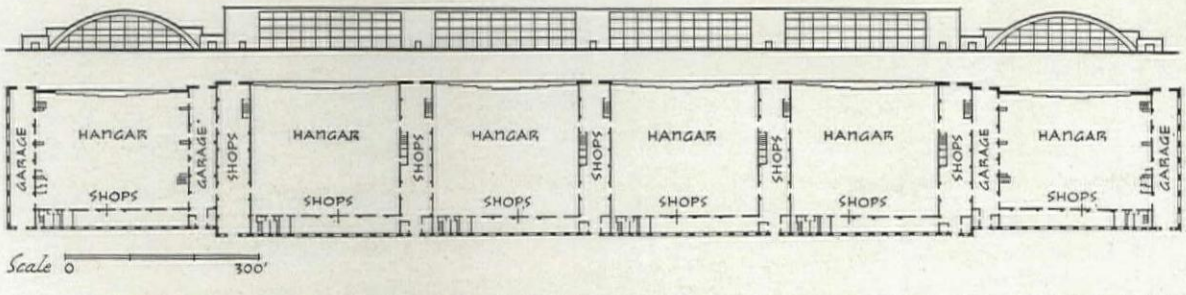
"Washington, of course, was fortunate in the possession of a site capable of development so close to the city. But that very proximity imposed aesthetic obligations never before incurred in airport construction in this country. Those aesthetic obligations are met for the present and for as far into the future as our knowledge of aeronautics can reach."



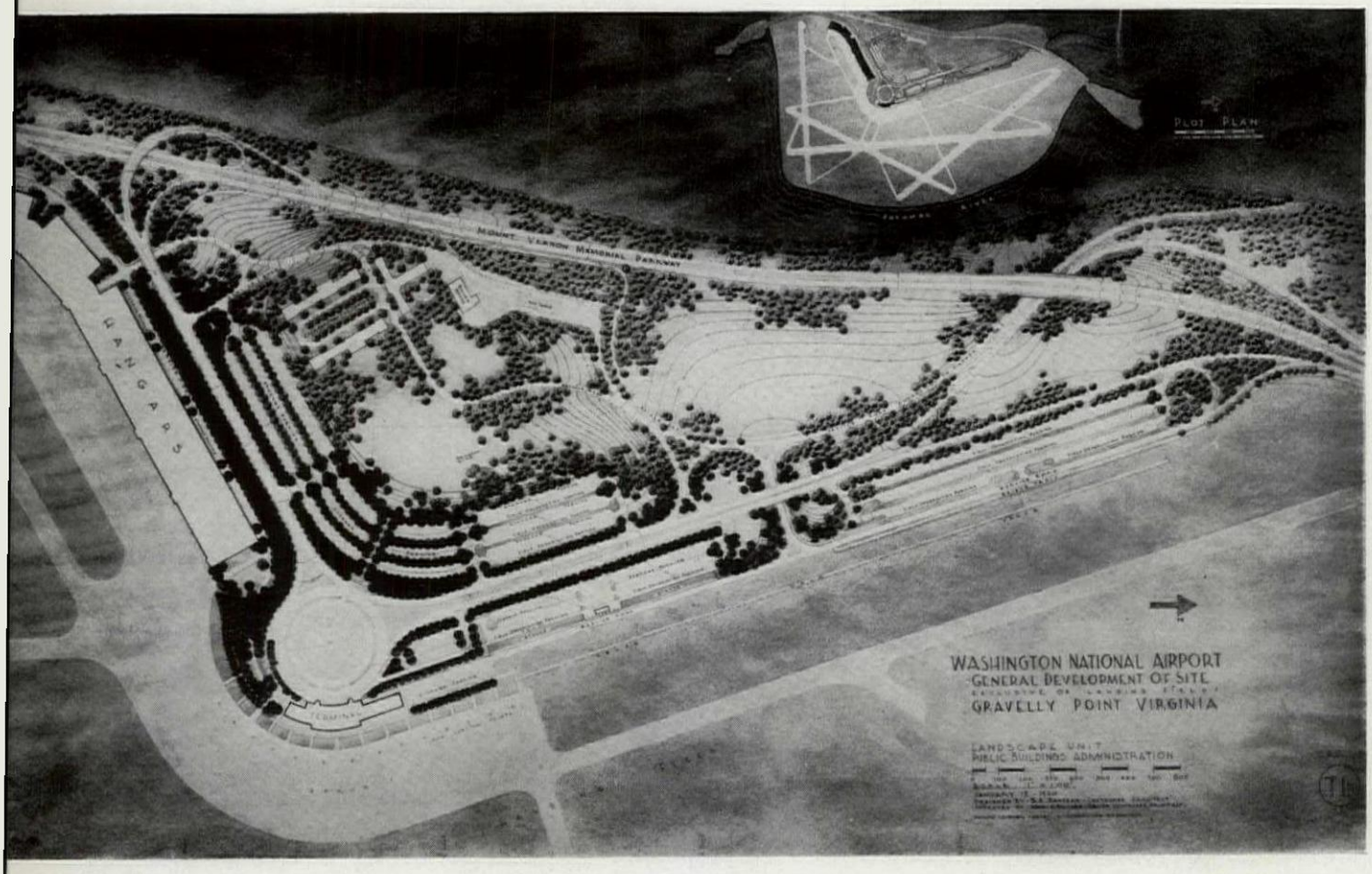
THE CONTROL TOWER OF THE WASHINGTON NATIONAL AIRPORT IS CONSIDERED BY THE CIVIL AERONAUTICS AUTHORITY TO BE THE BEST ARRANGED AND MOST WORKABLE YET DEVISED. ENGINEERS OF THE AUTHORITY DETERMINED BY TESTS THE MOST ADVANTAGEOUS ANGLES AT WHICH TO SET THE GLASS TO INSURE CLEAR VISION IN ALL DIRECTIONS AND TO ELIMINATE REFLECTIONS SUCH AS HAVE BEEN FOUND TROUBLESOME ELSEWHERE. THEY THINK THAT HERE THEY HAVE FOUND THE ANSWER. NOTEWORTHY, TOO, IS THE COMPACTNESS OF THIS CONTROL ROOM, ACHIEVED BY CAREFUL REDESIGN OF THE REQUIRED INSTRUMENTS AND APPARATUS WHICH MUST BE ARRANGED AROUND THE ROOM WITHIN EASY VIEW AND REACH OF THE OPERATOR. SIX LARGE HANGARS, EXTENDING IN A STRAIGHT LINE RUNNING NEARLY WEST FROM THE SOUTH END OF THE TERMINAL BUILDING, ARE SHOWN WITH DOOR DETAILS OPPOSITE



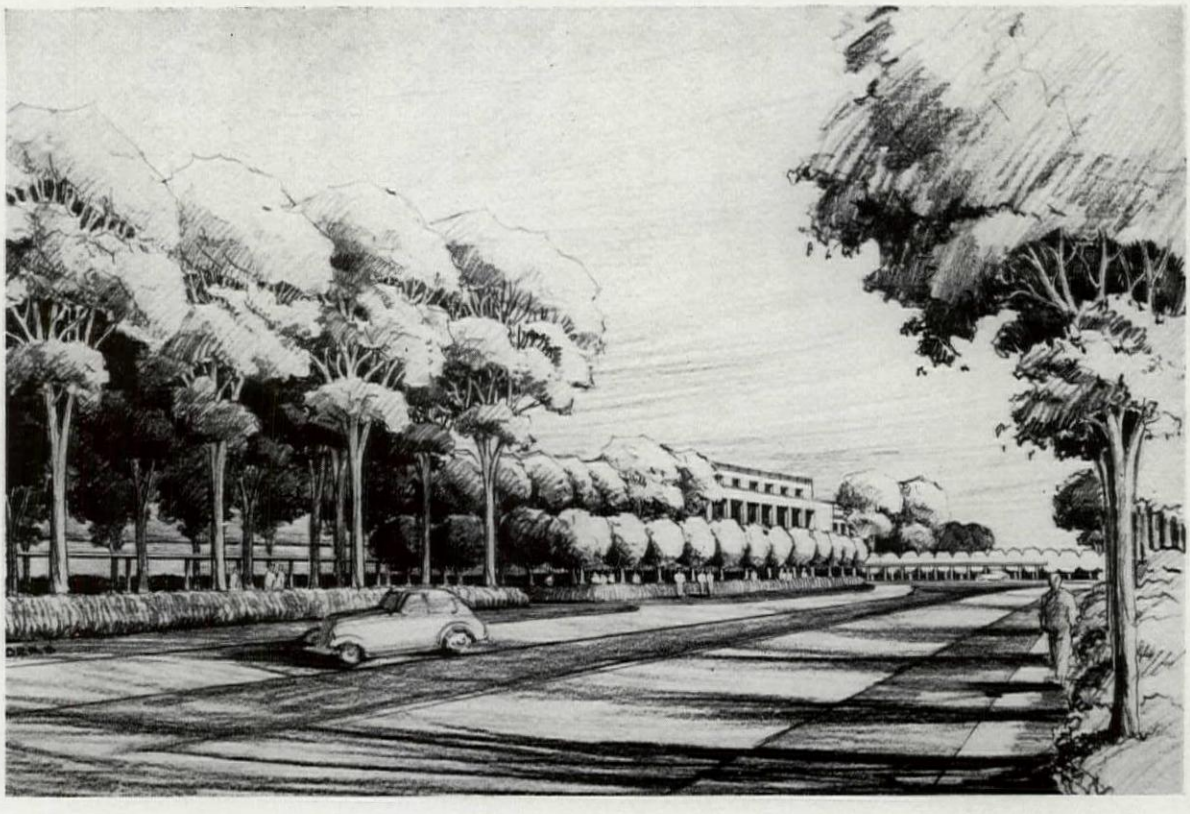
Door Details courtesy Truscon Steel Company

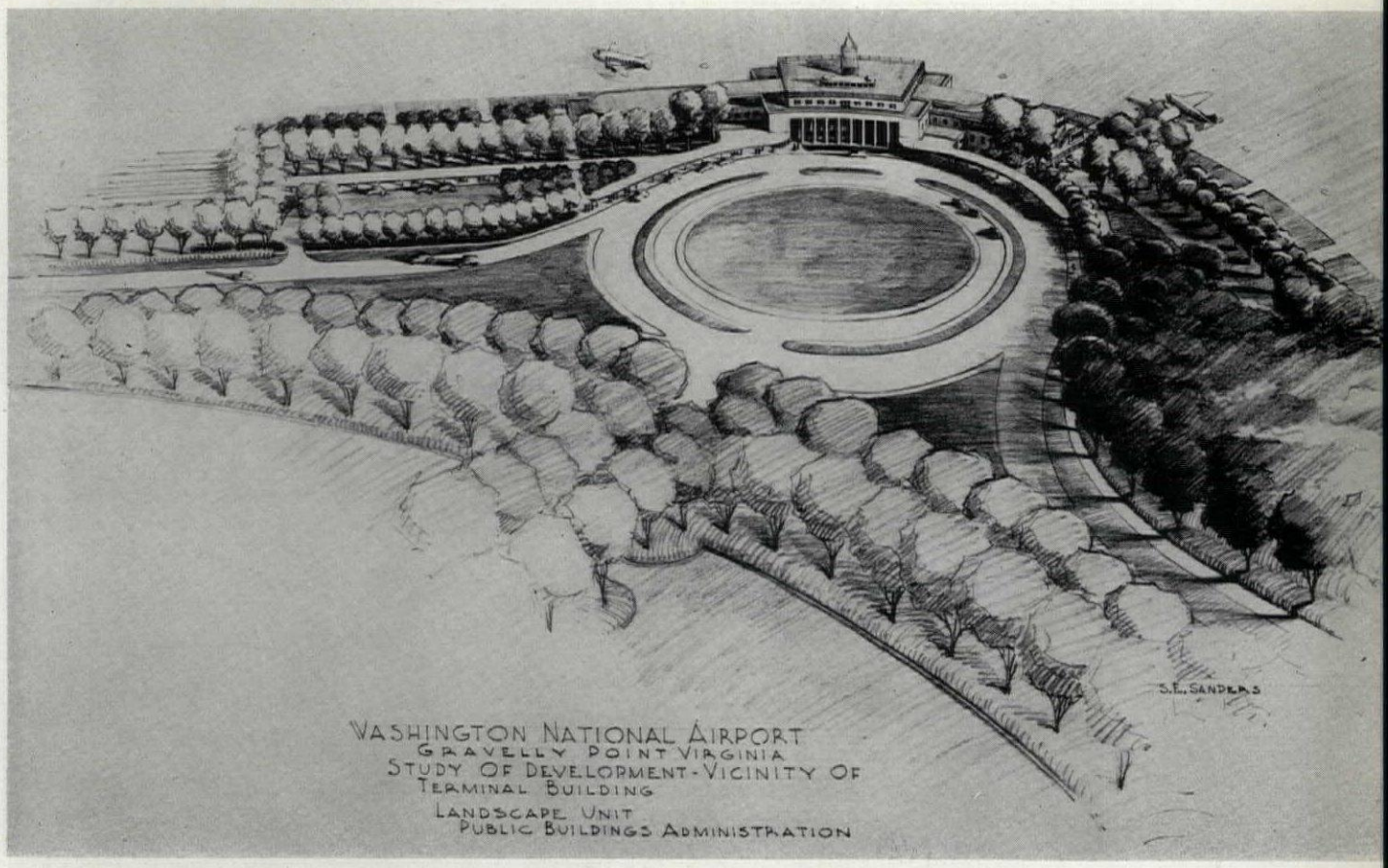


STRAIGHT LINE HANGAR ARRANGEMENT IS FINAL, SUPERSEDING EARLIER PLANS SHOWN ELSEWHERE

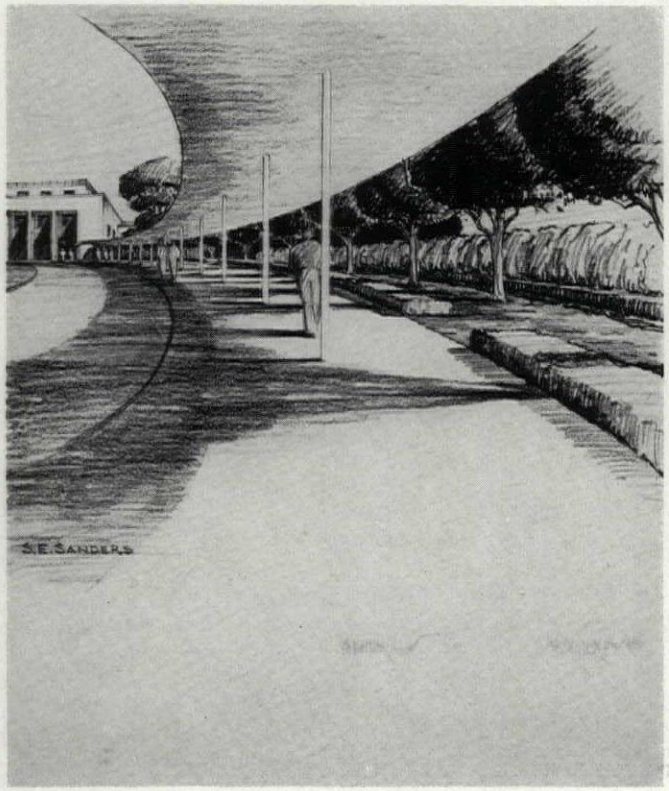


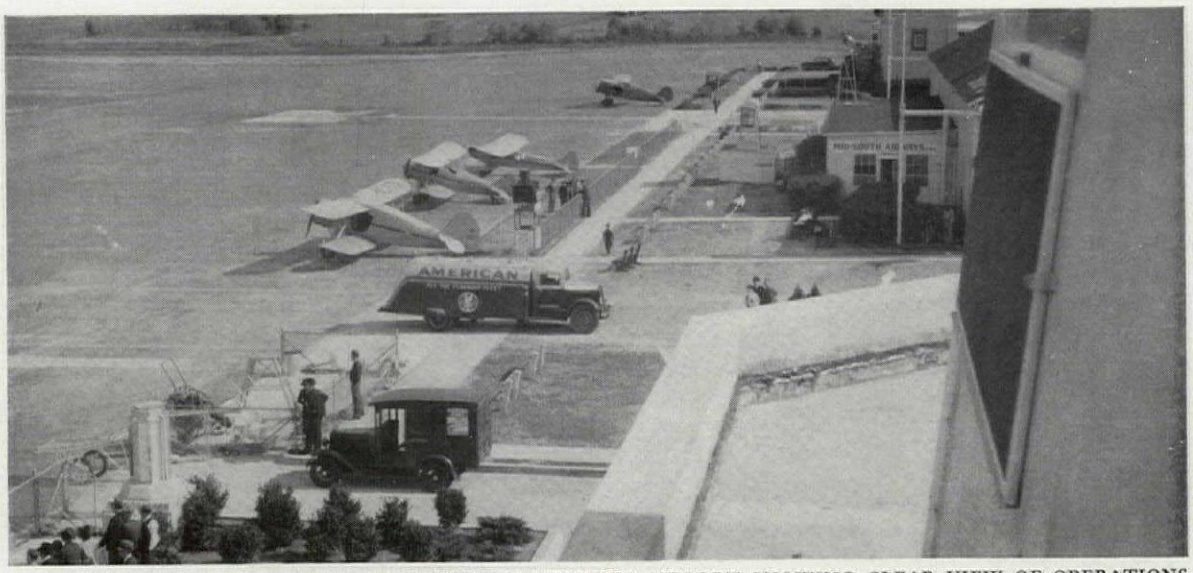
THE LANDSCAPE DESIGN OF THE GREAT TRIANGULAR AREA BETWEEN THE FIELD AND THE MOUNT VERNON MEMORIAL PARKWAY HAS SKILFULLY COORDINATED THE NATURAL ADVANTAGES OF THE SITE WITH THE FUNCTIONAL PURPOSES OF THE PROJECT. PARKING ARRANGEMENTS INCLUDE PROVISION FOR ACCOMMODATING 5000 CARS. NORTH OF THE TERMINAL BUILDING ITSELF AND OVERLOOKING THE FIELD ARE SEVERAL LARGE AREAS FOR TERRACED OR STEP PARKING WHERE THE PUBLIC MAY SIT IN ITS CARS AND VIEW THE OPERATION OF THE FIELD. STORAGE PARKING IS SEGREGATED AND SCREENED BY PLANTING





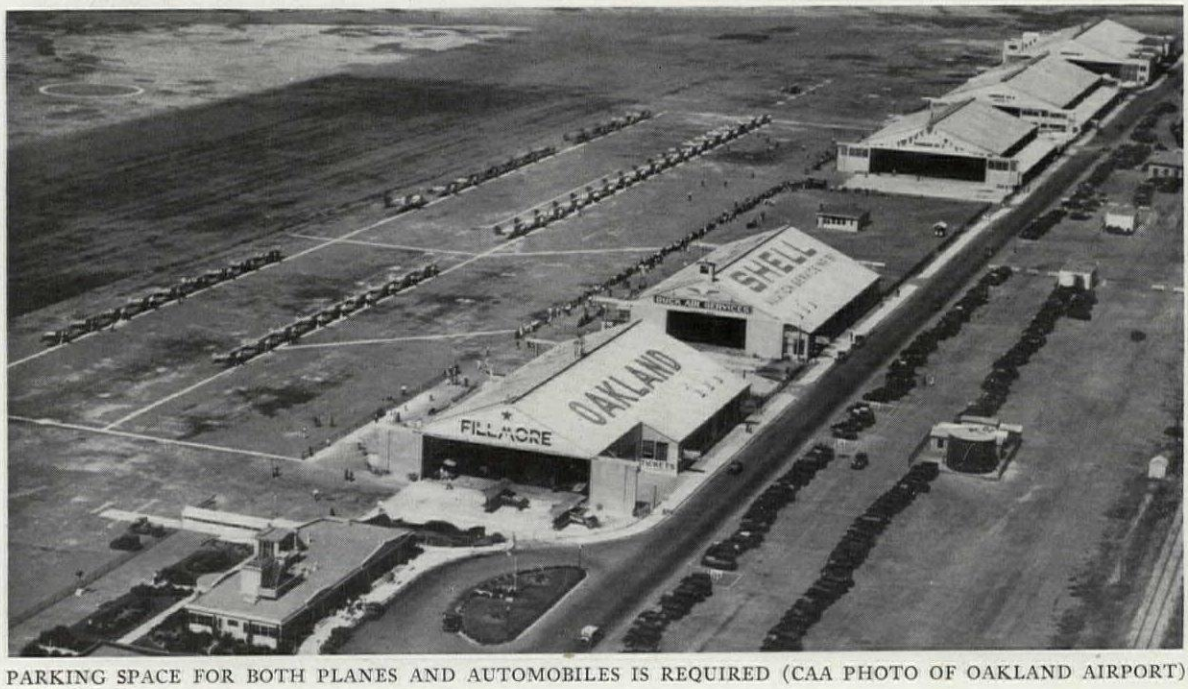
THE WHOLE AREA WILL BECOME A GREAT PUBLIC PARK. THE SKETCHES ON THESE TWO PAGES SHOW SOME OF THE ARRANGEMENTS FOR PLANTING, DESIGNED TO BE FUNCTIONAL AS WELL AS TO BEAUTIFY THE SITE. THEY WERE MADE BY S. E. SANDERS, ASSISTANT TO PUBLIC BUILDINGS ADMINISTRATION LANDSCAPE ARCHITECT H. N. BOUCHER





CAA PHOTOGRAPH FROM CONTROL TOWER OF MEMPHIS AIRPORT SHOWING CLEAR VIEW OF OPERATIONS

SHOPS AND OFFICES ARE CONSOLIDATED FOR EFFICIENCY AT LAGUARDIA FIELD, NEW YORK (WPA PHOTO)



PARKING SPACE FOR BOTH PLANES AND AUTOMOBILES IS REQUIRED (CAA PHOTO OF OAKLAND AIRPORT)

THE DEVELOPMENT OF AIRPORTS

BY MAJOR A. B. McMULLEN

A tremendous potential business exists for the professions of architecture and engineering, in the planning, designing, and construction of facilities for the aviation industry. Factories, downtown office buildings, warehouses, residences for employees, etc., are all included, but in this article I shall attempt only to summarize recent developments in the aviation industry which indicate the necessity for immediate construction of hundreds of new airports, hangars, administration and other buildings and the rebuilding and enlarging of many already in existence.

At the same time, I earnestly hope that these new facilities will be planned and designed with a greater knowledge of aviation, and with more vision than was exercised by those responsible for our present system of airports.

Up to January 1, 1940, approximately $346,595,000 has been spent in airport development, yet since 1934 the number of airports and landing areas in the United States and Alaska together has increased by less than fifty. During the past six-year period about 1,200 airports have been abandoned, principally because they were developed in the wrong place, at the wrong time, or on sites that would not permit expansion when the traffic required it.

More careful planning would have prevented the loss of many of these airports, together with large sums of public funds and private capital. Many buildings also have been removed or submitted to costly alteration necessary in many cases because of original poor planning. The accompanying floor plans of airport administration or terminal buildings were prepared by airport engineers in the office of the Administrator of Civil Aeronautics to illustrate how buildings of this type can be planned so as to permit expansion both horizontally and vertically with a minimum of change and disturbance to the first unit or units constructed.

Steady advancement in the art of flying and the design of the airplane has taken place since the first successful flight of a heavier than air machine 37 years ago. But the accelerating rate of development during the past six years, particularly the past two, has exceeded the most optimistic predictions of those actively engaged in the aviation industry. During this period we have witnessed general public acceptance of the airplane as a regular means of transportation, a major weapon of national defense and a means of sport and recreation, all of which will soon have a decided effect on our habits, our homes, our business and our national life.

The table (see page 616) briefly shows the steady progress that has been made in all phases of aviation *except airports* during the past six years. The estimates for 1940 in this table are based principally on increases made during the first six months of this year, which exceed any other six months in the history of aviation.

The sharp expansion in private and commercial flying is reflected in the increase in pilot certificates issued by the Civil Aeronautics Authority. On July 1, 1940, 41,006 pilots held certificates; as compared with 20,076

on July 1, 1938—an increase of over 100% in two years. On July 1, 1940, there were 35,183 active student pilot certificates; as compared with 15,556 on January 1, 1939—or an increase of approximately 125% during the past eighteen months.

During the twelve months ending June 30, 1941, the Civil Aeronautics Authority will provide primary flight training for approximately 45,000 new pilots, in addition to secondary and special training for approximately 30,000. During this same period increased Army and Navy training facilities should permit the inauguration of training schedules adequate to produce military pilots at a rate exceeding 10,000 a year.

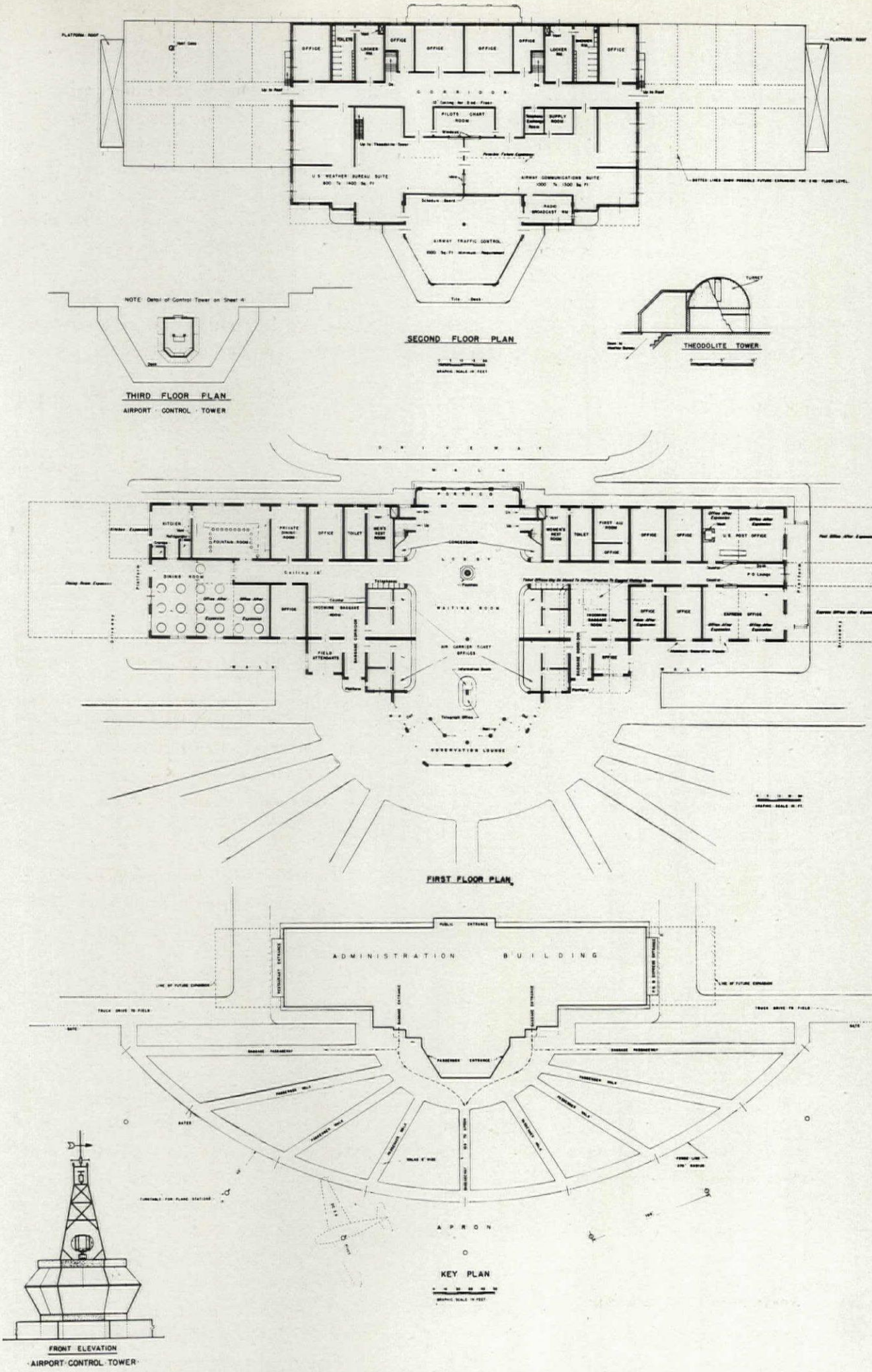
As of July 1, 1940, there were 2,718 more certificated aircraft than there were on the same date in 1939.

But where will all these planes and pilots continue to fly after they have received their certificates? Certainly not from the present

PROGRESS OF CIVIL AERONAUTICS IN THE UNITED STATES

Prepared by Airport Section, Technical Development Division, Administrator of Civil Aeronautics, Department of Commerce

	1934	1935	1936	1937	1938	1939	1940 (Estimated)
SCHEDULED AIR CARRIER OPERATIONS							
Miles of Airways:							
Domestic, foreign & territorial...	50,801	60,451	61,532	63,656	71,199	80,109	82,000
Miles Flown (revenue):							
Domestic routes	40,955,396	55,380,353	63,777,226	66,071,507	69,668,827	82,571,523	98,100,000
Foreign routes	8,109,377	8,487,345	9,834,544	11,331,858	11,389,300	11,356,991	11,500,000
Total	49,064,773	63,867,698	73,611,770	77,403,365	81,058,127	93,928,514	109,600,000
Airplanes:							
(In service & reserve)	518	459	380	386	345	363	370
Fuel consumed (gallons):	25,136,274	33,260,609	37,153,821	41,424,384	45,310,192	55,937,135	67,000,000
Express and freight carried:							
Pounds (domestic)	2,133,191	3,822,397	6,958,777	7,127,369	7,335,967	9,514,299	10,677,000
Pounds (foreign & territorial)	1,349,272	1,742,740	1,455,407	1,856,680	2,116,633	2,380,656	2,500,000
Total	3,482,463	5,565,137	8,414,184	8,984,049	9,452,049	11,894,955	13,177,000
Air Mail (Carried by Contractors):							
Pounds (domestic)	7,411,004	13,268,730	17,706,159				
Pounds (foreign & territorial)	460,885	503,585	617,853	714,180	785,025	977,145	
Total	7,871,889	13,772,315	18,324,012				
Passengers carried:							
Domestic, revenue and non-revenue	461,743	746,946	1,020,931	1,102,707	1,343,427	1,876,051	2,792,900
Foreign and territorial, revenue & non-revenue	110,522	127,170	145,112	187,028	192,684	218,894	250,000
Total	572,265	874,116	1,166,043	1,289,735	1,536,111	2,094,945	3,042,900
PRIVATE FLYING OPERATIONS							
Miles Flown:	75,602,152	84,755,630	93,320,375	102,996,355	129,359,095	177,868,157	235,000,000
Fuel consumed (gallons):	9,979,854	11,438,679	10,767,998	10,929,091	10,488,928	16,854,524	22,800,000
Passengers carried:	1,397,288	1,287,375	1,466,058	1,580,412	1,575,151	1,594,086	
CERTIFICATES							
Airplanes:							
Uncertificated	1,983	1,701	1,805	1,684	1,159	943	400
Certificated	6,339	7,371	7,424	9,152	10,000	12,829	15,870
Total	8,322	9,072	9,229	10,836	11,159	13,772	16,270
Pilots (All grades):	14,058	14,950	16,090	17,842	23,155	31,434	53,000
Student pilot certificates (issued y'rly):							
Airplane	11,994	14,572	17,675	21,770	15,556		65,000
Glider	225	330	209	125	98		384
PRODUCTION OF AIRPLANES...	1,615	1,691	3,010	3,773	2,698	3,715	5,100
AIRPORTS AND CAA INTERMEDIATE LANDING FIELDS							
Airports:							
Commercial & private	618	552	525	492	528	456	613
Municipal	702	739	738	764	791	643	646
Intermediate (CAA)	259	291	296	283	267	266	282
Army, Navy, Nat'l Guard & Misc.	718	786	783	760	788	915	804
Total airports in operation	2,297	2,368	2,342	2,299	2,374	2,280	2,345



CAA DESIGN RECOMMENDED FOR A TYPICAL ADMINISTRATION BUILDING SERVING A MAJOR AIRPORT

AIR TRAFFIC DEMANDS ALREADY TAX THE FACILITIES OF SOME OF THE NEWEST AIRPORT BUILDINGS, AS AT HOUSTON (CAA PHOTO ABOVE) AND MEMPHIS (PORTLAND CEMENT ASS'N PHOTO)

airports, many of which are experiencing difficulty in handling present traffic. The tremendous investment which the Government will have in these new pilots will not be adequately protected unless sufficient airports are provided convenient to their homes, in order that they may continue active flying.

Of the 237 cities within the continental United States designated as air carrier stops (July 25, 1940), 36 were not receiving this service due to inadequate airports. Of these 237 airports, only 35, or 14.7%, are of sufficient size (Class 3 or better). There is proposed under existing applications for "Certificates of Convenience and Necessity" air carrier service to an additional 94 cities. None of these cities has an airport of Class 3 or better, while 8 have no existing airports. A recapitulation of our existing and proposed air carrier airports shows that of these 331 landing areas, 257 are badly in need of expansion and modernization.

Certainly during the next two or three years, and possibly for the next ten years, the development of aviation will increase at a rate far exceeding anything we have seen to date. The President's goal of 50,000 planes a year, which to many sounds fantastic, may soon become a reality. Why not? With increased production, aircraft prices will decrease and low-powered civilian planes may cost no more, possibly less, than the average automobile. Then only two things will stop the continued production and use of aircraft in ever increasing numbers. They are: (1) adequate airports, including convenient and economical housing facilities; and (2) the art and science of controlling and guiding traffic which once in the air is free to move up, down, and in all directions on a horizontal plane.

The accompanying photographs stress the little attention that has been given, until recently, to the design of useful airport and airway traffic control rooms and towers, extremely important parts of any airport administration building.

HANGARS AND OTHER BUILDINGS

The hangar shortage in the United States is acute. At very few airports is storage available for transient aircraft. Hundreds of locally-owned planes are parked out-of-doors. This lack of storage facilities is a serious determent to the sale of civil aircraft, as few persons will purchase an airplane costing from $1,500 to $15,000 or more and leave it exposed to the weather, careless sightseers, etc.

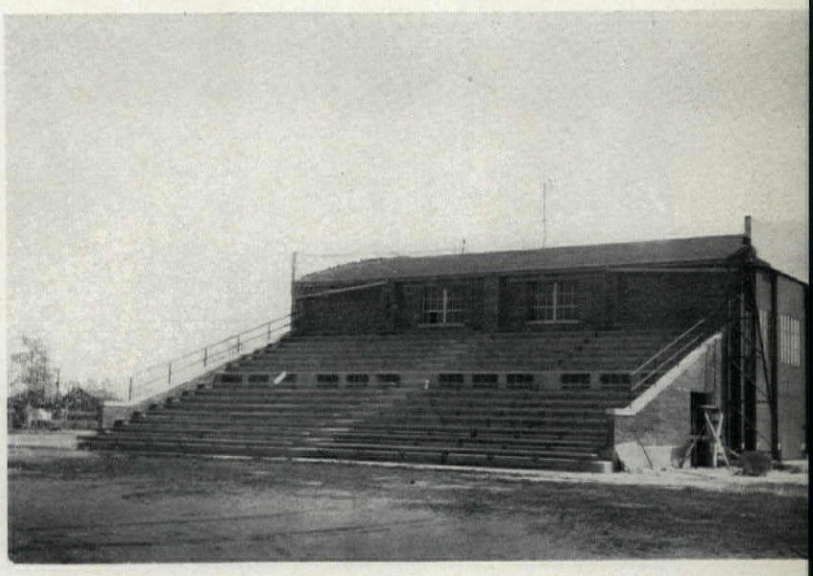
The Civil Aeronautics Authority has been cognizant of the inadequacy of our airport system for some time. In March 1939 this

agency submitted a report to Congress recommending annual Federal appropriations and the inauguration of a long range airport construction program for the development of a system comprising 3,500 airports. Due to the rapid rate that civil and military aviation has advanced since the above report was submitted, a system of approximately 4,000 civil airports is now considered necessary in the continental United States, Alaska and other United States possessions.

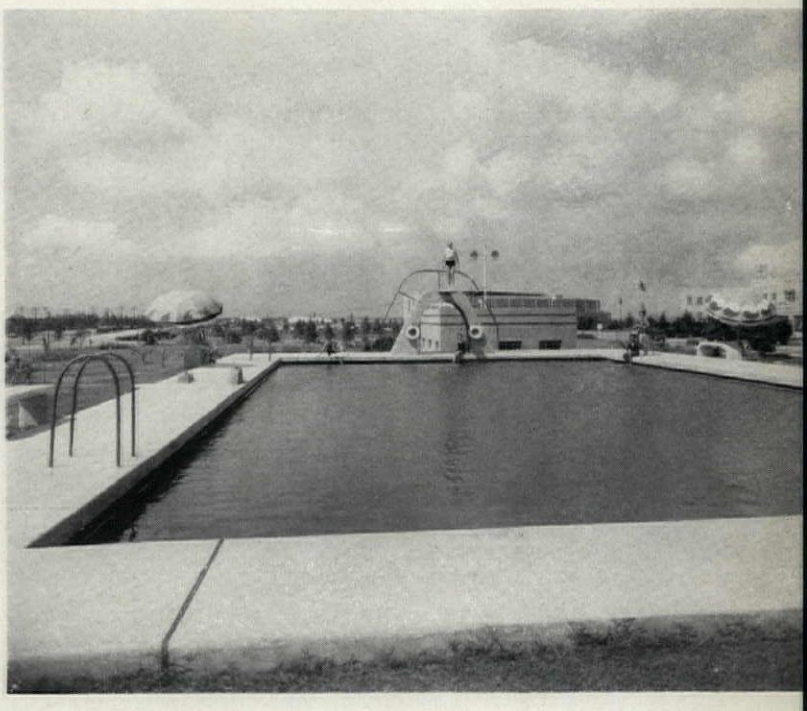
Approximately $680,000,000 is needed to develop the system, of which $70,000,000 would be required to construct about 2,900 hangars and 1,400 administration and other buildings which should be provided within the next two or three years.

Legislation is now pending in both houses of Congress authorizing the appropriation of funds to the C.A.A. to assist states and communities with the development of airports. As the bills are now written, however, none of the above mentioned funds may be used for the construction of buildings, therefore, some form of low cost, long range financing will be necessary to stimulate necessary hangar and administration building construction.

The Army and Navy air forces will soon occupy many existing civil airports with large tactical units and flight training schools. Many new buildings will be required to house their activities, but also important is the fact that many new airports will have to be developed together with buildings to accommodate the civilian fixed base operators, flying schools and private flyers that must move out to make way for the military forces.



A BLEACHER HAS BEEN ADDED TO THE HANGAR AT MONROEVILLE, ALABAMA, FOR CROWDS AT AIR MEETS. SWIMMING POOL AT NEW ORLEANS AIRPORT IS ALSO A RESERVOIR FOR FIRE CONTROL



UNDERGROUND HANGARS

It is ironical that the airplane which freed man from the shackles that formerly confined his travels to the surface of the earth drives him underground for protection.

The demonstrations of demolition and destruction to both property and life by bombing aircraft during the present war in Europe should leave no question as to the desirability of constructing bombproof structures to house personnel, essential industrial activities, supplies, and particularly airport activities, as the airport is one of the first major objectives of a hostile air force.

Too little attention in the United States has been devoted to the design and construction of underground hangars, shops, housing facilities for personnel, supplies, etc. The rolling and mountainous terrain extending over large parts of the United States makes the construction and camouflage of underground hangars possible near existing or

potential landing areas. The time to build bombproof structures is *before* the attack is anticipated. No commander is going to waste bombs on an objective that is known to be bombproof or reasonably so, and the proper construction of a reasonable number of bombproof buildings or caves in strategical areas *now* to house our aircraft and aviation activities may entirely discourage future attacks.

Aircraft or engine repairs and routine checking or refueling can naturally be performed much more quickly and efficiently by personnel protected from inclement weather and hostile forces.

The construction of underground hangars for airplanes with wing spreads up to 100 feet is not a serious problem, but the wing spread of new transport and military planes ranging up to 200 feet and the resultant widths and heights of hangars large enough to accommodate them have caused engineers and others to predict that the cost of building underground storage facilities for them would be prohibitive.

It requires weeks to build these newest and largest bombers and transport planes at a cost ranging from $300,000 to $500,000 each. If destruction of ten such planes were prevented, the cost of an underground hangar to protect them would seem to be justified, particularly when the time required to replace them in an emergency is considered.

The information available in this country on the design of underground and bombproof structures is limited to relatively few engineers and architects, and an educational campaign on this subject, including the lessons being learned daily in Europe, would seem to be appropriate at this time.

PLANNING

Not only the volume of aerial traffic but also the wide range in speeds between the different types of civil and military aircraft, ranging from 75 to 450 m.p.h., make it desirable to separate the different types of traffic either by parallel runways on the same airport or by providing two or more airports, if safe, efficient and regular operations are to be maintained. For example, every automobile driver has experienced the annoyance of being blocked in a line of traffic behind a slow moving truck or car. In the air this situation becomes more than an annoyance as it is impossible for the 200, 300 or 400-mile-an-hour transport or military plane to slow down to the 90 m.p.h. average speed of a 50 h.p. light plane that lands at 30 miles an hour.

The old plan of accommodating all types of traffic on any one airport is rapidly becoming passé in most communities of 25,000 and over, and as many as 10 or 15 airports may soon be required around our largest cities to safely and conveniently accommodate local, transient, air carrier, and military aviation. The architect, engineer or planner who fails to visualize this trend may soon discover the building, or buildings, he designed or constructed have become a monument to his lack of vision—and his limited knowledge of aviation.

The airport or system of airports, including the buildings located thereon, should be planned to accommodate all the airplanes and all the allied activities the mind can conceive taking place on or in them, and then designed to permit orderly development as requirements dictate.

* * * *

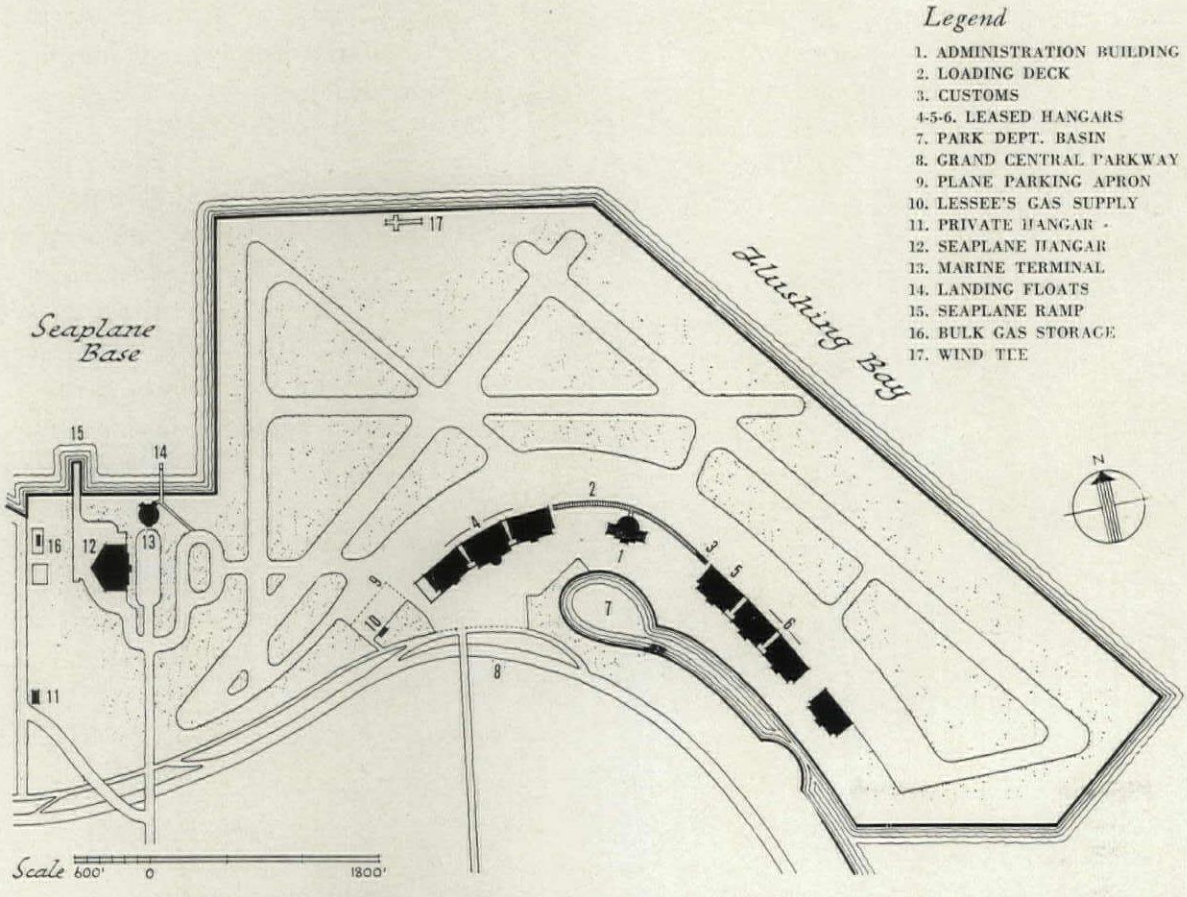
This business of aviation is a dynamic, fast-growing industry. Just what the weights, sizes or speeds of future airplanes will be no one knows. Nor do we know the uses now possibly undreamed of to which they may be put or the numbers that will be used.

Only one thing is certain—airplanes must have places from which to take-off and land, and hangars or buildings in which they can be repaired, serviced or stored. Millions of people will soon be using the airplane as millions are now using the automobile and many airport buildings will be necessary to accommodate them.

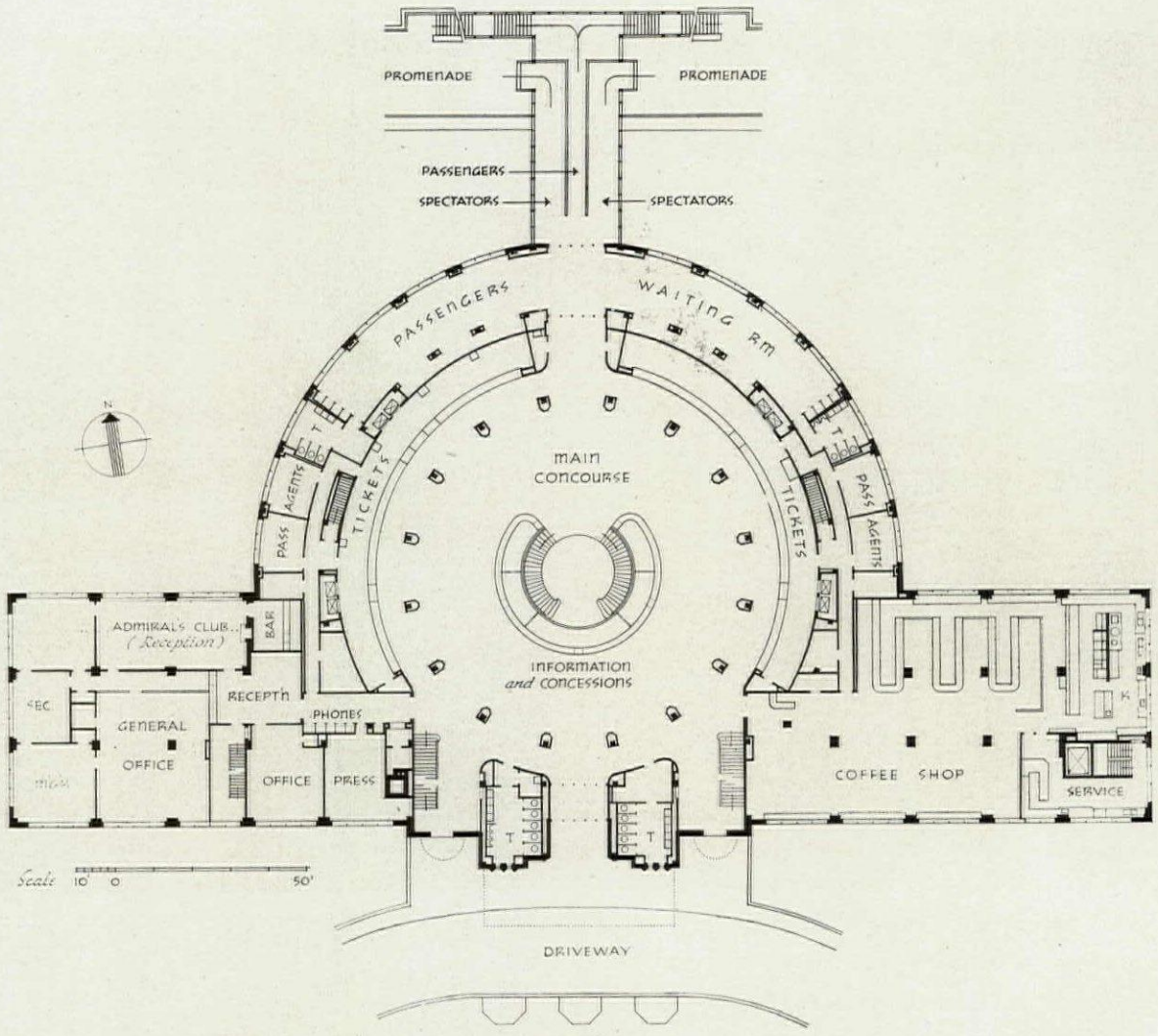
For a long time this sign will be hanging outside the industry's front office:

WANTED:—*Architects and Engineers with imagination, vision, resourcefulness, and working knowledge of aviation.*

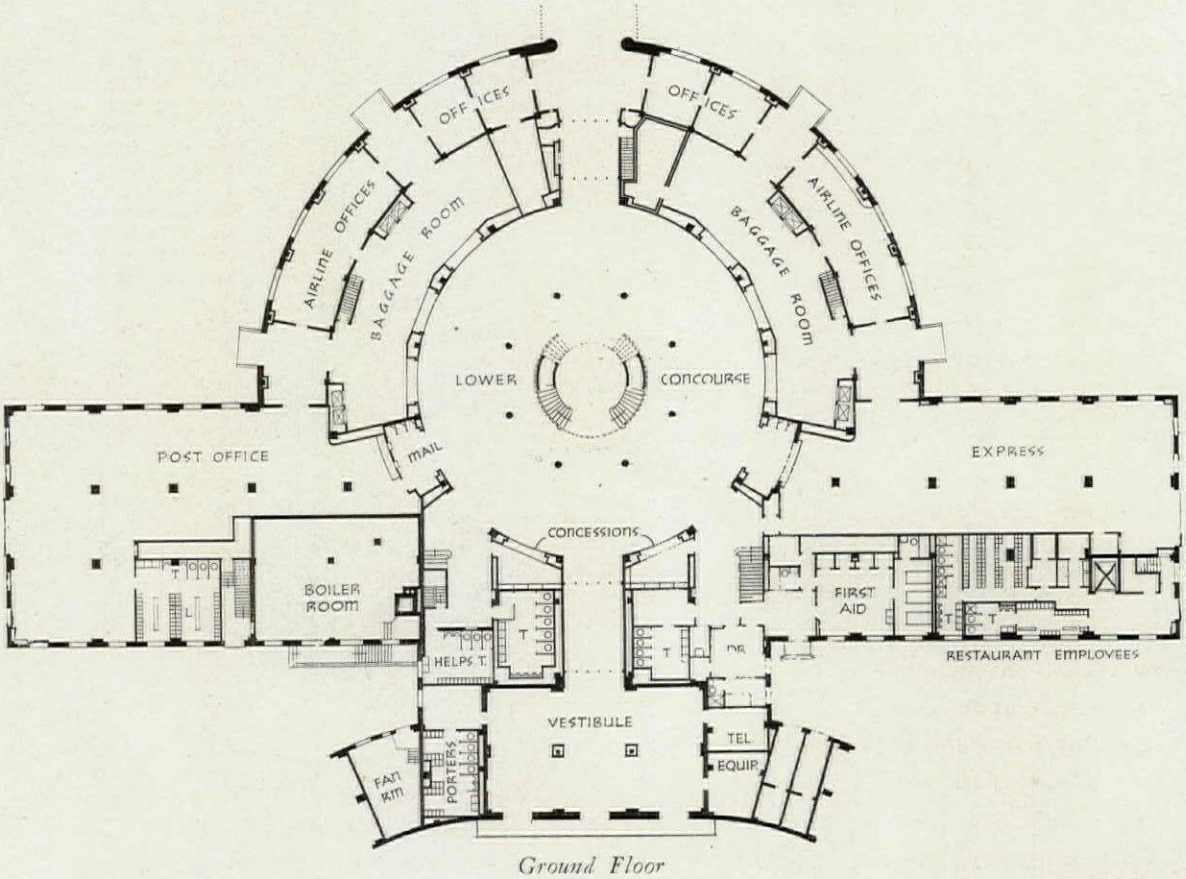
FIELD SIDE OF THE ADMINISTRATION BUILDING AND LOADING PLATFORM (PHOTO BY KENNETH REID)



NEW YORK MUNICIPAL AIRPORT — DELANO & ALDRICH, ARCHITECTS



First Floor

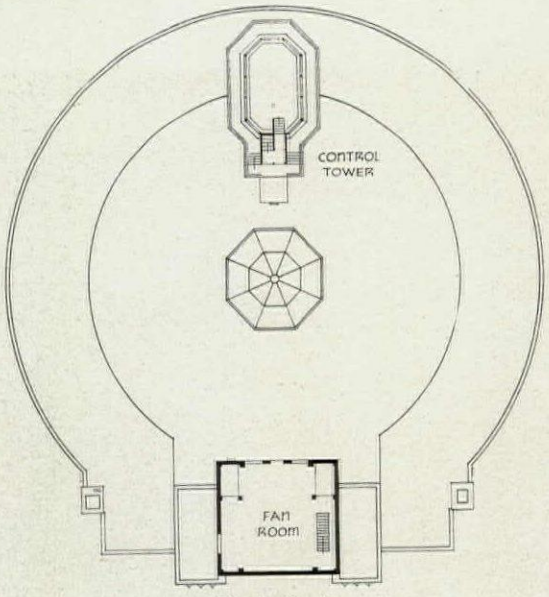


Ground Floor

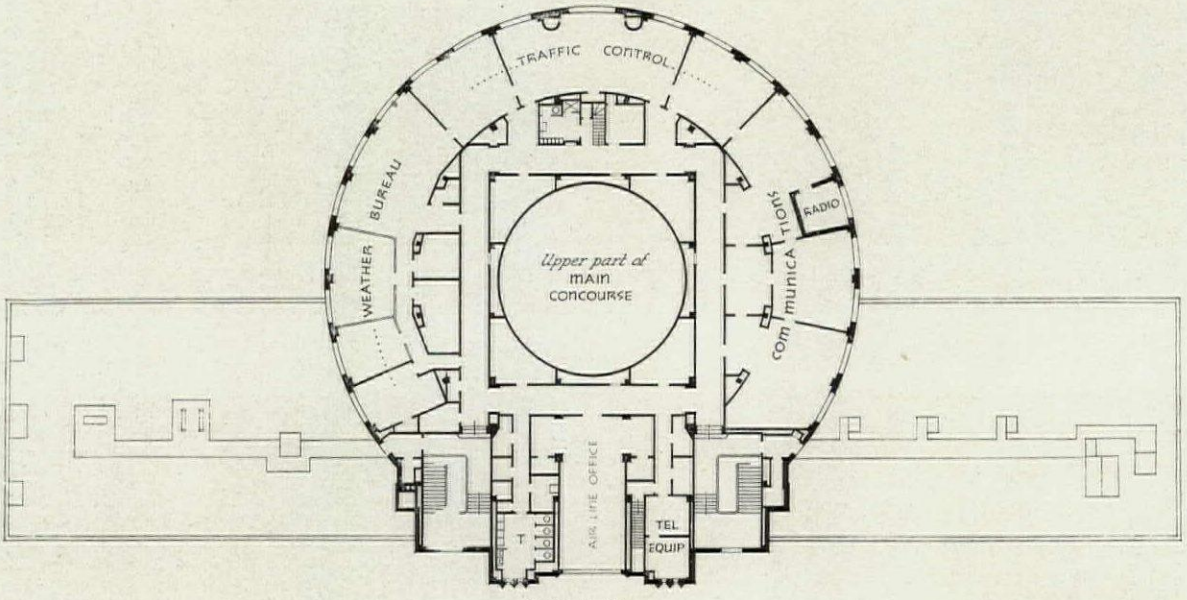
FACADE OF LAND PLANE ADMINISTRATION BUILDING, LAGUARDIA FIELD (PHOTOS BY KENNETH REID)

THE DESIGN OF A GREAT MODERN AIRPORT MAY BE REGARDED AS A PROBLEM IN COORDINATION OF THE MULTIPLE ELEMENTS — RUNWAYS SCIENTIFICALLY LOCATED BY WIND-ROSE; FIELD BUILDINGS ADEQUATE TO SERVE THE TECHNICAL REQUIREMENTS AND PROPERLY PLACED TO MEET AVIATION, COMMERCIAL, AND PUBLIC NEEDS; AN ADMINISTRATION BUILDING AND HANGARS, OF A SIZE AND WITH FACILITIES ACCURATELY FORECAST FOR A PUBLIC CARRIER WHOSE PHENOMENAL DEVELOPMENT HAS ASTONISHED EVEN THOSE AVIATION LEADERS ONCE TERMED "VISIONARY." THE NEW YORK MUNICIPAL AIRPORT "LAGUARDIA FIELD," AT NORTH BEACH, FOR WHICH DELANO & ALDRICH WERE THE ARCHITECTS, ADMIRABLY ILLUSTRATES ALL THESE POINTS. ITS LANDPLANE AND MARINE TERMINAL BUILDINGS, ITS GREAT HANGARS, ITS OFFICE BUILDINGS, AND OTHER FIELD FACILITIES MAKE THIS THE LARGEST PROJECT OF ITS KIND AND HIGHLY EXACTING TO DESIGN

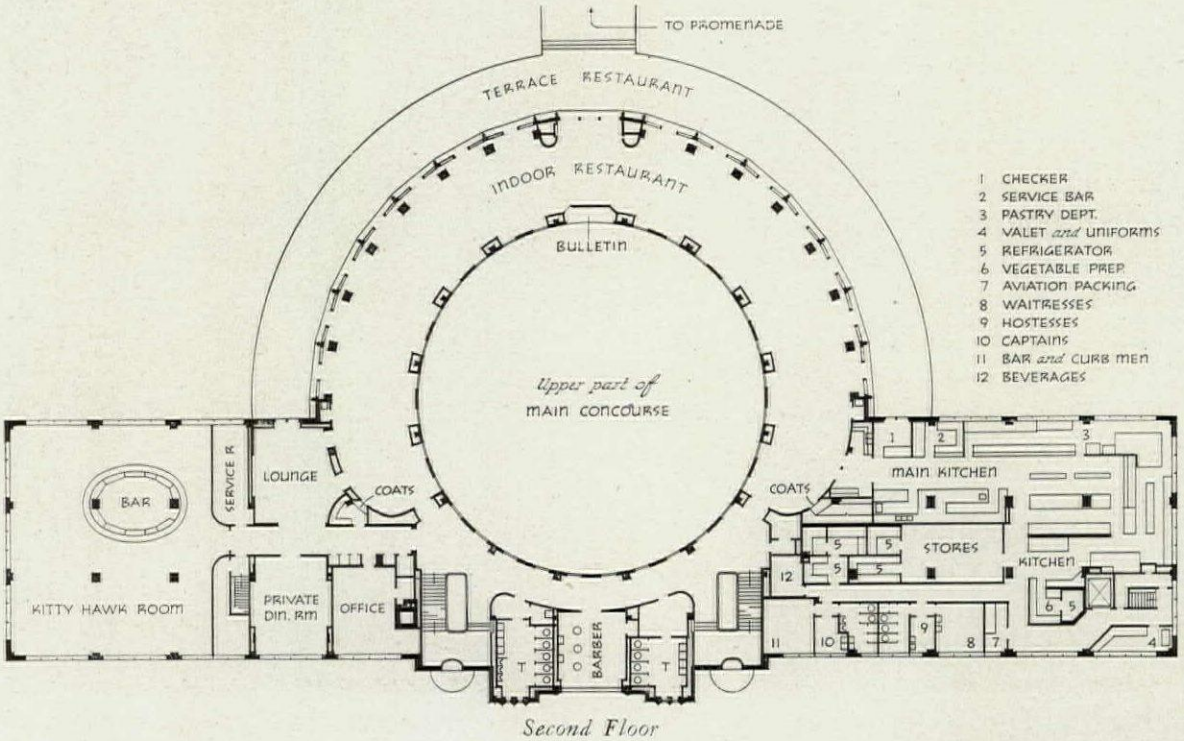
ENTRANCE RAMP. STEEL EAGLE IS BY T. A. AND I. W. BECK



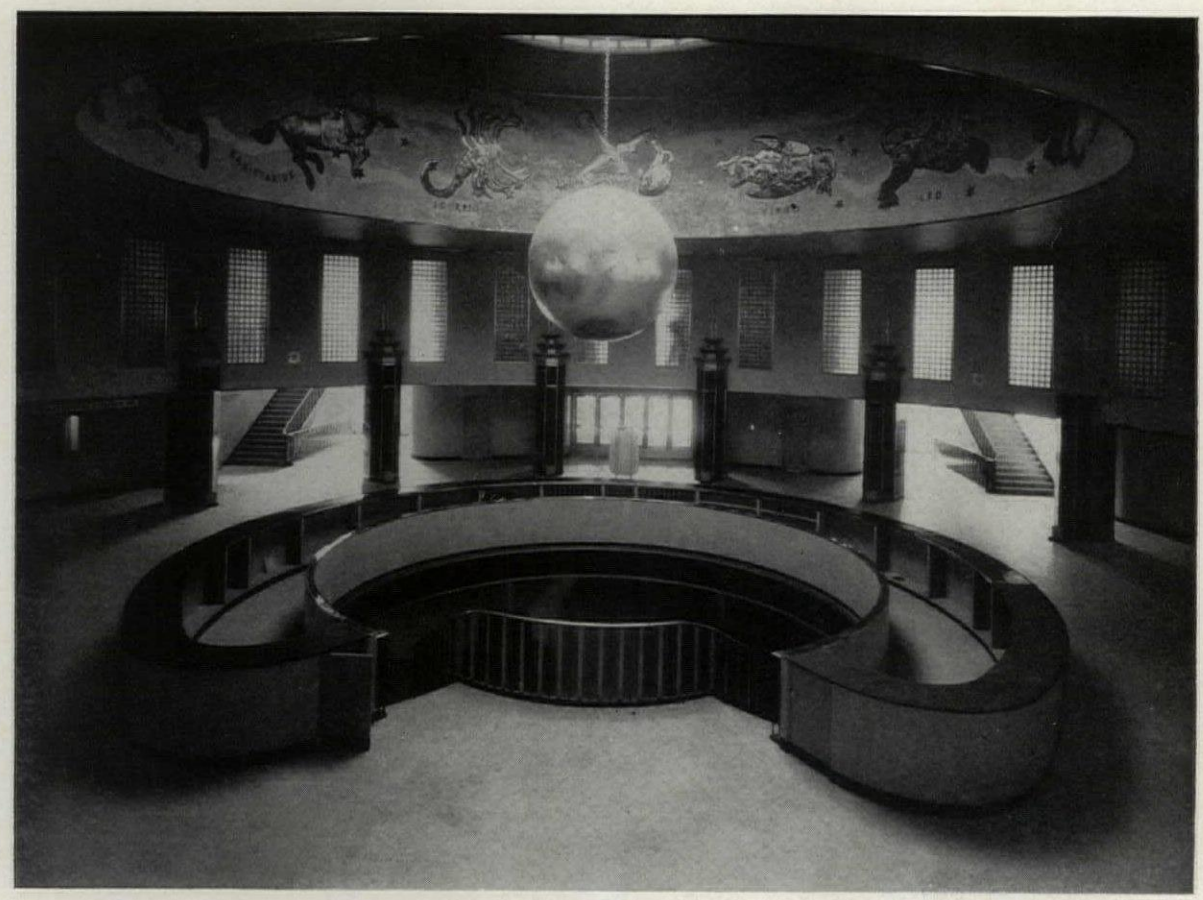
Roof Deck



Third Floor

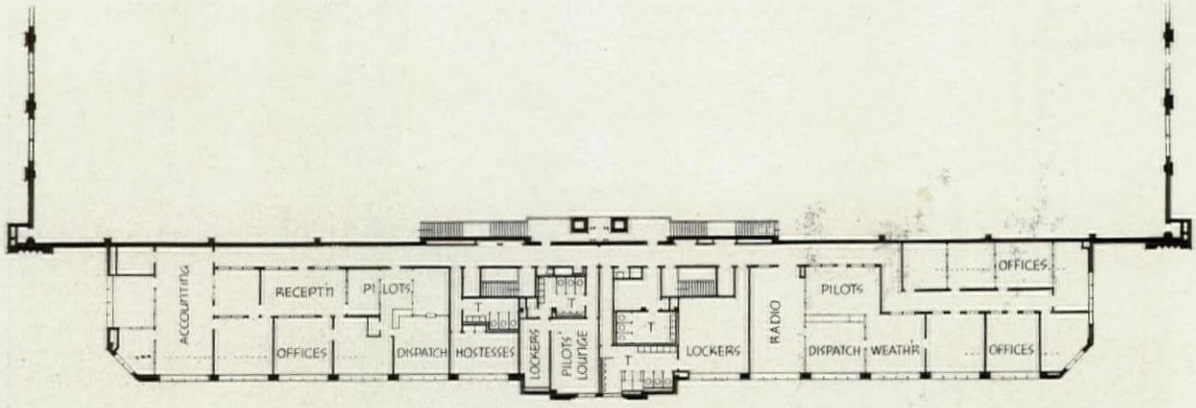


Second Floor

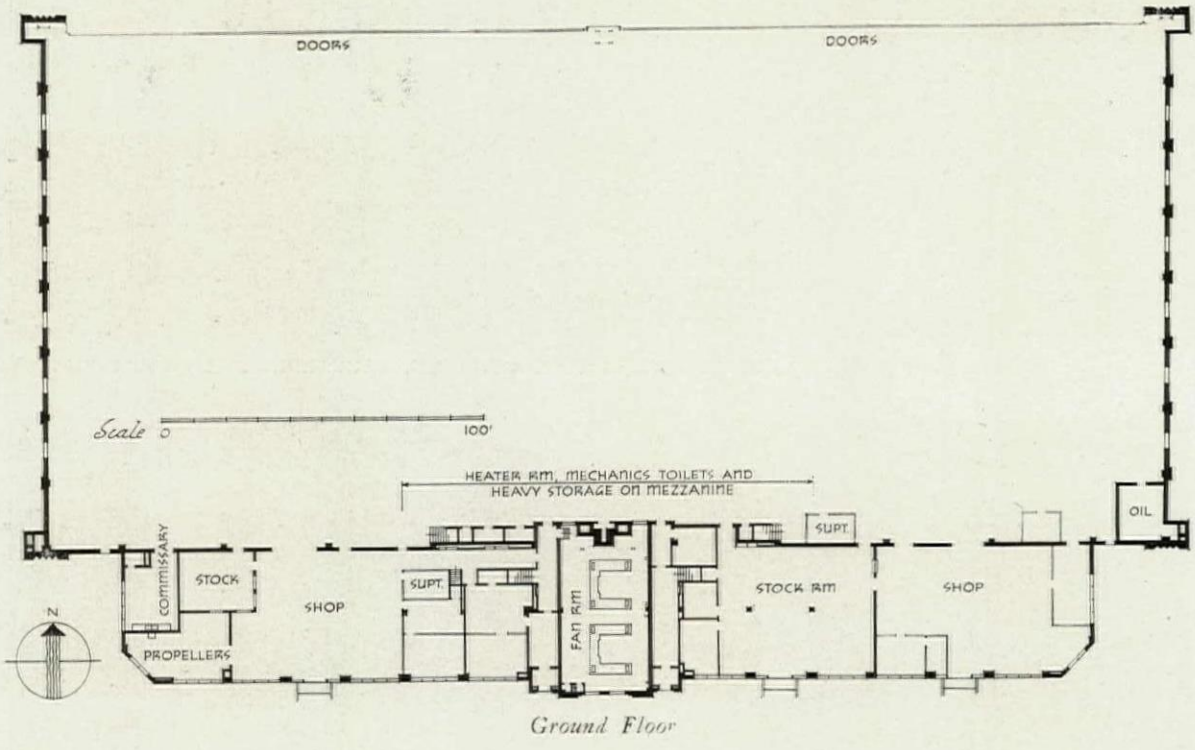


CIRCULAR CONCOURSE OF LAND PLANE ADMINISTRATION BUILDING, LAGUARDIA FIELD (WPA PHOTO)

THE GOLD ZODIAC SIGNS ON GRAY ARE THE WORK OF ARTHUR COVEY. (WPA ART PROJECT PHOTO)

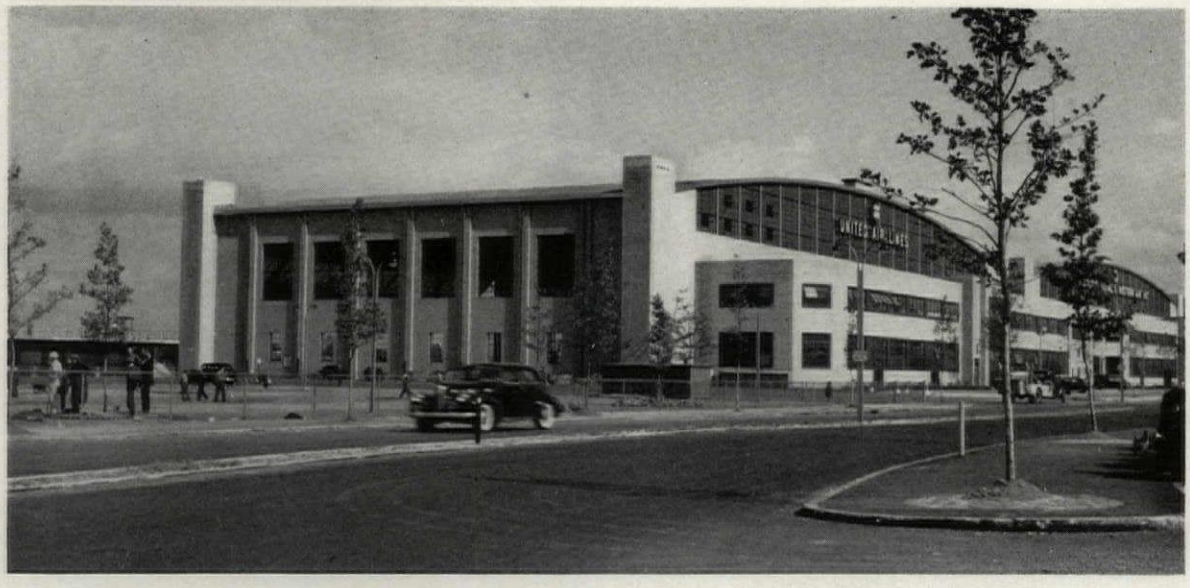


Second Floor

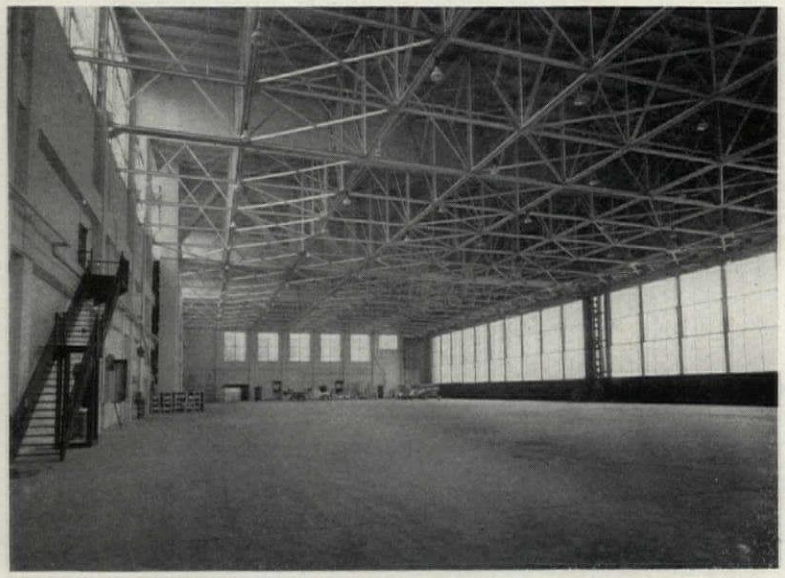


Ground Floor

PLANS (ABOVE) OF THE SEVENTH LANDPLANE HANGAR, NOW UNDER CONSTRUCTION, AT LAGUARDIA FIELD MAY BE REGARDED AS TYPICAL OF THE BUILDINGS PROVIDED FOR THE COMMERCIAL LINES USING THE AIRPORT. IN THIS CASE THE OFFICE AND SHOP BUILDING AT THE FRONT IS DIVIDED TO SERVE TWO TENANTS OF THE HANGAR. ELEMENTS OF THIS TWO-STORY PORTION ARE CAREFULLY COORDINATED WITH THE FACILITIES AND ACTIVITIES IN THE HANGAR ITSELF, WHERE DELANO & ALDRICH PROVIDED ELECTRIC OUTLETS, HOT AND COLD WATER AND COMPRESSED AIR OUTLETS, DRAIN LINES (WITH OIL SEPARATORS), AND COPPER GROUNDING RODS AT 40-FOOT INTERVALS ACROSS THE LEVEL 10-INCH SLAB STONE-CONCRETE FLOOR. EXPANSION JOINTS ARE AT THE SAME INTERVALS. STEAM SERVICE OUTLETS ARE PROVIDED ON SIDE WALLS. SINCE SOME DESIGNERS REGARD A HANGAR AS ESSENTIALLY A SHELTER WITH ADEQUATE ENTRANCE FOR PLANES AND AFFORDING PROTECTION FROM WEATHER AND DISASTER, IT SHOULD BE NOTED THAT THE NORTH BEACH HANGARS ARE EQUIPPED WITH VAST DOORS ON THE FIELD SIDE SPECIALLY DESIGNED BY THE TRUSCON STEEL COMPANY (SEE DETAIL ON PAGE 628) AND THAT THEY ARE WELL HEATED BY UNDER-FLOOR DUCTS AROUND THE WALLS, PARTICULARLY PROVIDING A "CURTAIN" OF HOT AIR ACROSS THE VAST DOOR OPENINGS. FOR FIRE PROTECTION A SYSTEM OF THE RATE-OF-RISE DELUGE TYPE HAS BEEN INSTALLED, WHICH REACTS IMMEDIATELY TO A SUDDEN TEMPERATURE RISE RATHER THAN AWAITING SUPER-HEAT AT A FIXED RELEASE POINT. THIS PREVENTS SPREAD OF EVEN A LITTLE FIRE

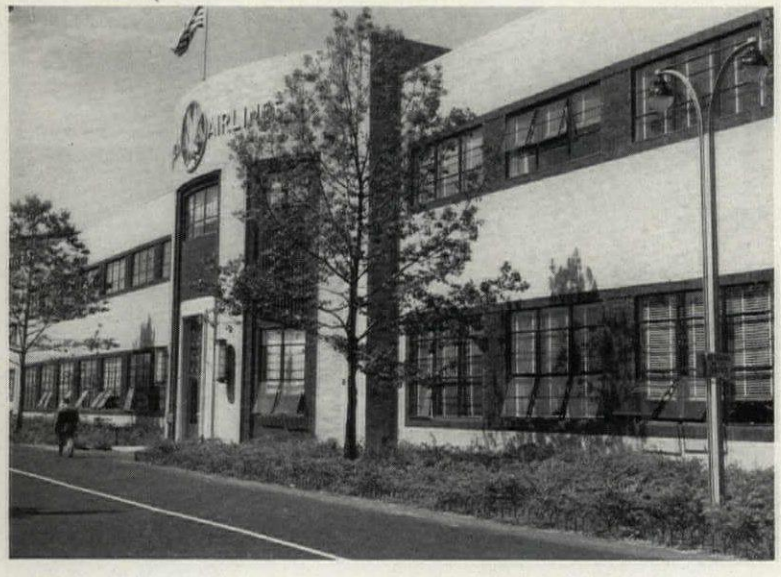


TWO TYPICAL LAND PLANE HANGARS AT LAGUARDIA FIELD

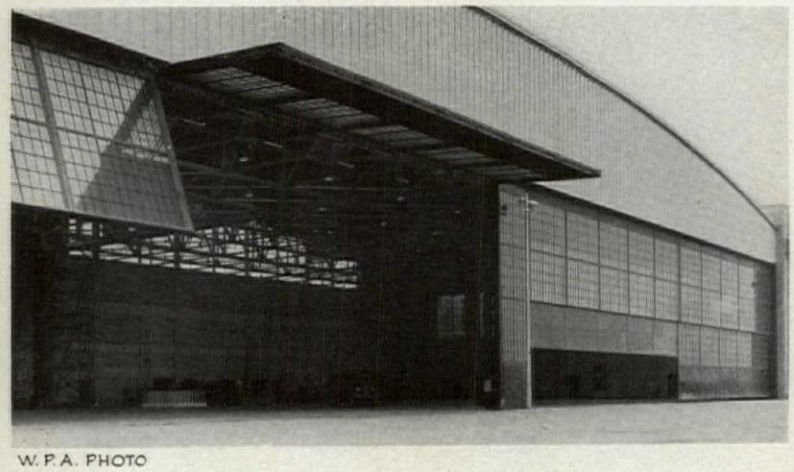


HANGAR INTERIOR IS FLOODED WITH LIGHT (WPA PHOTO)

THE SOUTH AND EAST WINDOWS LIGHTING THE HANGARS ARE OF GLASS THAT HAS BEEN HAMMERED AND TREATED TO MINIMIZE GLARE AND SUN HEAT. CONTROLLED VENTILATION IS ALSO EXTREMELY IMPORTANT BECAUSE OF PLANE PAINTING AND OTHER OPERATIONS WITH HIGHLY INFLAMMABLE MATERIALS. LIGHTS IN THE HANGARS ARE INCANDESCENT AND MERCURY VAPOR, TO APPROXIMATE DAYLIGHT, AND IN SOME SHOPS FLUORESCENT LIGHT IS USED. ELECTRIC FIXTURES ARE EXPLOSION-PROOF

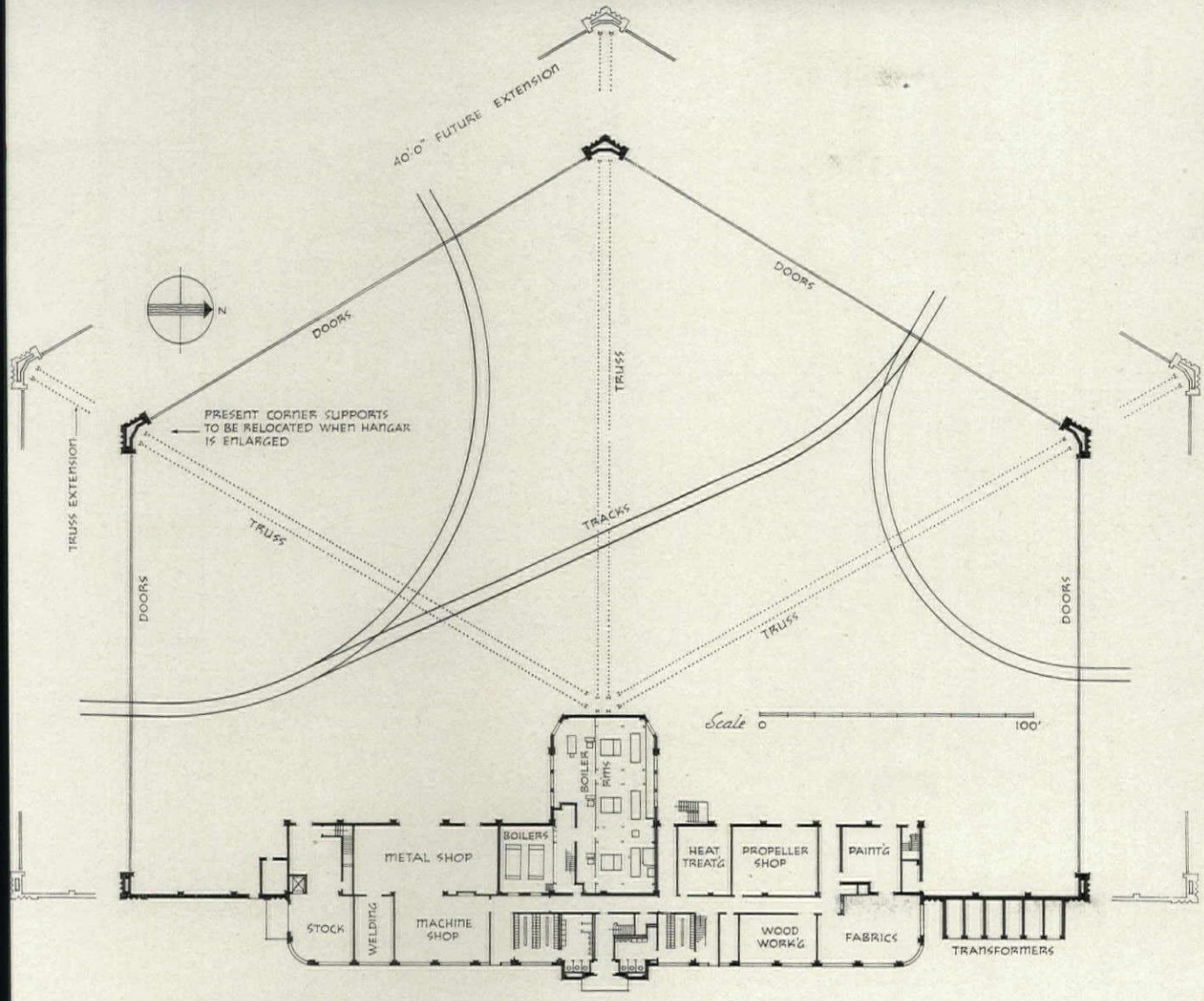


OPERATIONS OFFICES (EXTERIOR PHOTOS BY KENNETH REID)

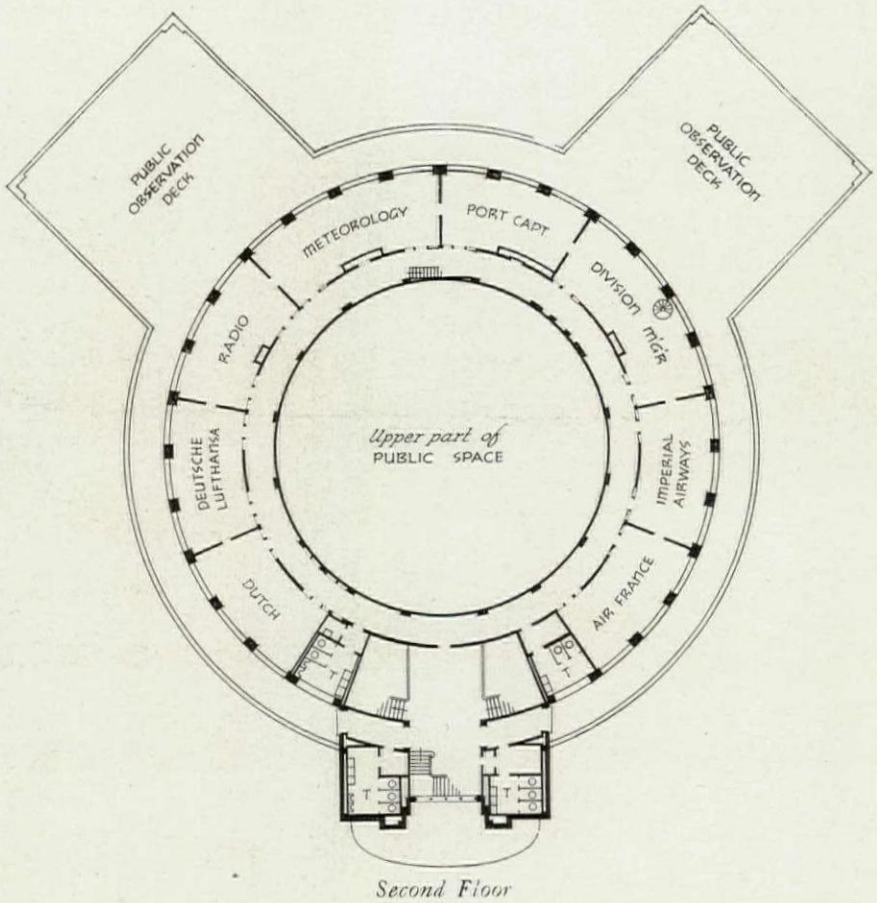


W. P. A. PHOTO

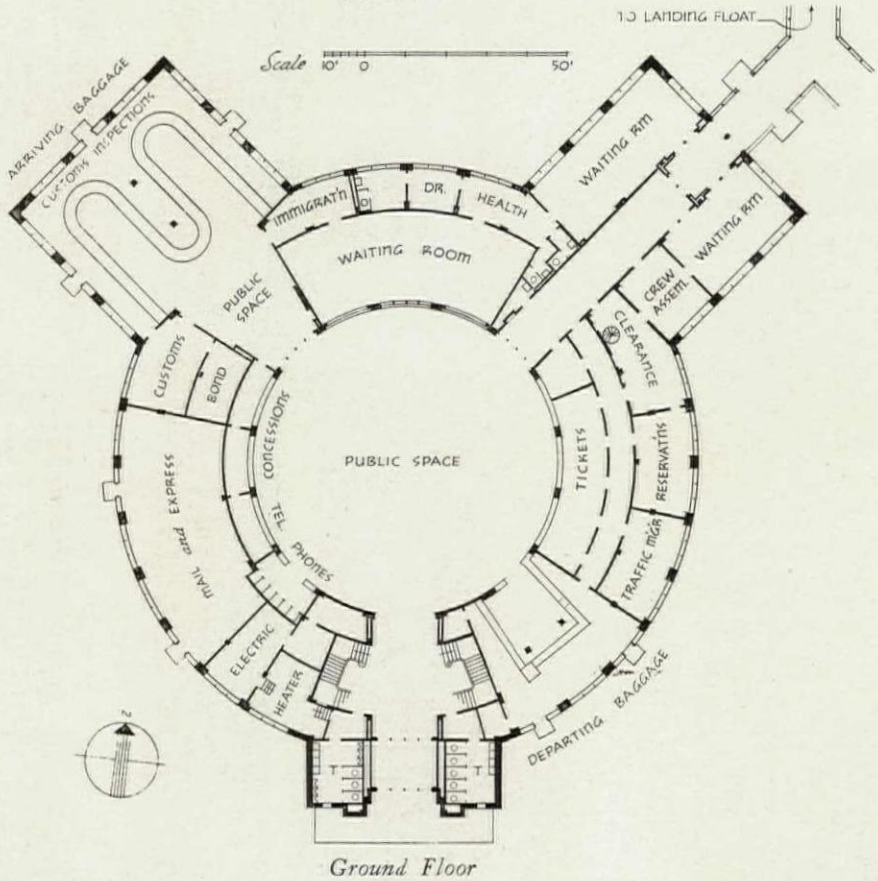
BECAUSE THE MAINTENANCE OF AN EVEN TEMPERATURE AND CONSERVATION OF HEAT IN A HANGAR ARE VITAL FACTORS OF OPERATION, ELECTRICALLY-OPERATED DOORS DESIGNED BY TRUSCON STEEL CO. FOR HANGARS AT LAGUARDIA FIELD ARE SO ARRANGED THAT THE LOWER SECTIONS CAN BE RAISED VERTICALLY, PERMITTING ENTRANCE OR EXIT OF SMALL AND AVERAGE SIZE PLANES BUT AVOIDING HEAT LOSS IN THE UPPER PORTION OF THE HANGAR. EVEN WHEN THE ENTIRE DOOR IS SWUNG OUT FROM THE TOP, AS A SORT OF MARQUEE, THE CURTAIN OF HOT AIR PREVENTS AN EXCESSIVE LOSS OF HEAT INSIDE, UNDER ORDINARY WIND CONDITIONS. THE OPENINGS ARE 40 FEET HIGH IN THE CLEAR, SO HANGARS OF THIS SAME SIZE DESIGNED WITH A CONTINUOUS TRUSS TO ELIMINATE THE COLUMNS AT THE CENTER WOULD ACCOMMODATE THE LARGEST ARMY BOMBERS NOW ON ORDER. DOORS WERE PLACED AT AN ANGLE IN THE MARINE HANGAR (ACROSS-PAGE) TO ACCOMMODATE THE SEAPLANES (WIDER THAN LANDPLANES)



PLAN AND VIEW OF SEAPLANE HANGAR (PAN AMERICAN AIRWAYS) AT LAGUARDIA FIELD (WPA PHOTO)



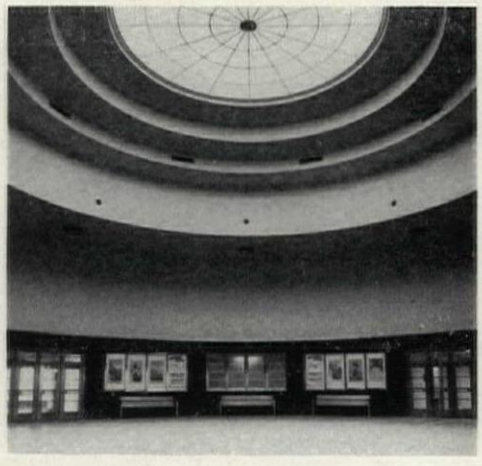
Second Floor



Ground Floor

THE MARINE TERMINAL, AT THE WESTERN END OF THE AIRPORT, HARMONIZES WITH THE ADMINISTRATION BUILDING AND PROVIDES ALL FACILITIES OF AN INTERNATIONAL PORT OF ENTRY. OFFICES ASSIGNED TO FOREIGN CONCERNS (SEE PLAN ABOVE) ARE ALL OCCUPIED NOW BY PAN AMERICAN AIRWAYS, BUT IT IS EXPECTED THAT ANOTHER INTERNATIONAL CARRIER WILL SHARE THE FACILITIES OF THE BUILDING SOON

THE MARINE TERMINAL IS THE MOST-DECORATED BUILDING AT LAGUARDIA FIELD. FLYING FISH ADORN THE EXTERIOR AND THE INTERIOR (RIGHT) WILL HAVE A CONTINUOUS MURAL 12 FEET HIGH AROUND THE ROTUNDA, PAINTED AS A WPA ART PROJECT. THE FIRST SECTION OF THE MURAL, "FLIGHT," BY JAMES D. BROOKS IS SHOWN BELOW. IT SYMBOLIZES MAN'S FIRST ATTEMPT TO ESCAPE THE BOUNDS OF EARTH. WILLIAM A. DELANO OF THE FIRM OF DELANO & ALDRICH, ARCHITECTS OF THE AIRPORT, COMMENTED, AS WORK STARTED, "THE MURAL RAISES THE CEILING IN EFFECT BY THE INTRODUCTION OF A DARKER TONE ABOVE THE BLACK MARBLE BASE." (WPA ART PHOTO)



ICARUS FALLING—FIRST SECTION OF MURAL, "FLIGHT," BY JAMES D. BROOKS IN MARINE TERMINAL

W. P. A. PHOTO

THE DESIGN OF THE CONTROL TOWER ATOP THE ADMINISTRATION BUILDING (DETAILED HERE) RESULTED FROM A CAREFUL STUDY OF ATMOSPHERIC CONDITIONS, FIELD VISIBILITY, ANGLES OF LIGHT, AND COURSES OF APPROACHING AND DEPARTING PLANES. A FULL VIEW OF THE FIELD OPERATIONS IS ESSENTIAL FROM A CONTROL TOWER, WHICH MIGHT BE TERMED THE "NERVE CENTER" OF THE AIRPORT. THIS TOWER IS AIR-CONDITIONED TO PREVENT CONDENSATION AND IS EQUIPPED WITH ALL DEVICES TO INFORM THE OPERATORS OF EVERY ACTIVITY. THE AIRPORT'S FACILITIES ALSO INCLUDE PLANE-TO-SHORE COMMUNICATION TO THE MARINE TERMINAL AND PNEUMATIC TUBE MESSAGE SYSTEMS IN ALL BUILDINGS

NEW YORK MUNICIPAL AIRPORT — DELANO & ALDRICH, ARCHITECTS

RECENT LITERATURE ON AIRPORTS

COMPILED BY ALAN MATHER

This list of the publications which have appeared since 1935 is by no means all-inclusive. It is a selection of books and articles helpful to the architect who has an airport to design. Literature which does not fall within that scheme has been carefully excluded. For a list of works covering a wider range, write to the Civil Aeronautics Authority, Washington, D. C., for its BIBLIOGRAPHY ON AIRPORTS. The Institute of the Aeronautical Sciences, R.C.A. Building West, Rockefeller Center, has, in its library, a very comprehensive BIBLIOGRAPHY OF AERONAUTICS, Part 37, compiled by USWPA, 1937. The address of the publication office and the price per single issue of each magazine listed is as follows:

- *Aero Digest*, 515 Madison Ave., New York, N. Y. Single numbers 35c.
- *Aeroplane*, 175 Piccadilly, London, W.1., 6d.
- *Architect and Engineer*, 68 Post St., San Francisco, Cal. 50c.
- *Architectural Forum*, Time Inc., 330 E. 22nd St., Chicago. $1.00.
- *Architectural Record*, 115 W. 40th St., New York, N. Y. $1.00.
- *Architectural Review*, The Architectural Press, 45 The Avenue, Cheam, Surrey, England. 2s. 6d.
- *Aviation*, 330 W. 42nd St., New York, N. Y. 35c.
- *The Builder*, 4 Catherine St., London, W.C. 2., 9d.
- *Engineering News-Record*, McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York, N. Y. 25c.
- *Flight*, Dorset House, Stamford St., London, S.E. 1., 6d.
- *Journal of the Royal Institute of British Architects*, The Institute, 66 Portland Place, London, W.1., 1s. 6d.
- *Military Engineer*, Mills Building, Pennsylvania Ave. at 17th St., N.W., Washington, D. C. 75c.
- *Pencil Points*, 330 W. 42nd St., New York, N. Y. 50c.
- *Roads and Streets*, Gillette Publishing Co., 330 South Wells St., Chicago.
- *Transactions of the Illuminating Engineering Society*, Illuminating Engineering Society, 51 Madison Ave., New York.

GENERAL WORKS

Books

- CIVIL AERONAUTICS AUTHORITY. *Airport Design Information.* (Civil Aeronautics Authority, Washington. D. C., 1940, 59 pages.) Factors determining site location and size of airports. General information on drainage systems, grading, surfaces, and buildings. Tables. List of Civil Aeronautics Authority publications and drawings.

- CARL PIRATH, Editor. *Aerodromes: Their location, operation, and design.* (Isaac Pitman and Sons, Ltd., London, 1938, 120 pages, $2.50.) This is a translation of a research monograph of the Scientific Institute for Air Transport Technical College, Stuttgart. Part 2 deals with airport planning in relation to flight and clearance procedure. The movement of planes on existing German airports and revised layouts to better suit that movement are shown diagrammatically. This is an invaluable book. It doesn't present ready-made schemes on pages which can be easily torn out for reference, but it illustrates a method of functional analysis which is essential to intelligent design of airports. This book is hard to get. The Institute of the Aeronautical Sciences, R.C.A. Building, Rockefeller Center, New York City, has a copy in its library.

Magazine articles

- *"Airports."* *Architectural Forum*, Vol. 73, August 1940, pages 73 to 88. An investigation into planning problems and principles. Diagrams, text, and photos outline requirements of passenger, sightseer, express and mail circulation. Hangar and terminal building requirements and plan examples are discussed. Plans and description of an airport scheme by Fellheimer and Wagner, Architects, and L. L. Odell, Aviation Consultant.

- *"Basic Requirements for Airport Design."* *Engineering News-Record*, Vol. 125, July 4, 1940, pages 40 to 44. An abstract of the information in the Civil Aeronautics Authority's *Airport Design Information.*

- ELISABETH COIT. *"The Smaller Airport."* *Pencil Points*, Vol. 18, Nov. 1937, pages 739 to 741. Comment of an amateur flyer on the markings, plane housing facilities, and auxiliary buildings needed on minimum size fields.

- HENRY LLOYD-MARTIN KNIGHT. *"Layout of Airport Runways for Future Expansion."* *Aero Digest*, Vol. 31, Sept. 1937, pages 32 and 33. Aircraft design with its steadily increasing demands for larger and speedier planes has forced a trend toward larger airports. The author holds that this trend threatens to exceed sound economic limits. Diagrams show methods of allowing for expansion. Plan for an 8-runway airport.

- JOHN WALTER WOOD. *"An Outline of Airport Requirements, and Solution of the Problem."* *Aviation*, Vol. 36, August 1937, pages 26 and 27, and Oct. 1937, pages 26 and 27. Comprehensive list of circulation, loading, land and building problems and recommendations. Diagrams to illustrate expansion by stages and plane circulation under varying wind conditions, for a "Wood System" (patented) airport.

REVIEW OF AIRPORTS

Magazine articles

• LT.-COL. BREHON SOMERVELL. *"Planning North Beach Airport." Engineering News-Record,* Vol. 124, March 28, 1940, pages 61 to 72. Maps, site plan, floor plans of land plane and marine plane terminal buildings and seaplane hangar building, some construction details and general description of New York City's airport.

• GEORGE McLAUGHLIN. *"Santos Dumont Airport,* Rio de Janeiro, Brazil." *Aero Digest,* Vol. 35, Oct. 1939, pages 62 and 65. Site plan, floor plans of administration building and passenger station of a large airport with seaplane and land plane facilities. Photos of passenger station and restaurant which are of excellent Modern design. The author is editor of *Aero Digest.*

• *"Airports at Manchester, England, and Le Bourget, Paris." Architectural Review,* Vol. 85, Feb. 1939, pages 90 and 91. Site plan, floor plans, photos, general description of two large terminals.

• *"Exeter Municipal Airport." Architectural Review,* Vol. 84, Sept. 1938, pages 95 to 98. Plan, photos of a combined flying club and concourse building in Modern style.

• *"Berlin's New Airport." The Aeroplane,* Vol. 54, Jan. 26, 1938, pages 118 and 119. Plan, general view sketch, general description of the new Tempelhof airport.

• HARRY S. PACK. *"Air Terminals for Transatlantic Services." Aero Digest,* Vol. 31, Nov. 1937, page 46. Site plans, discussion of airport layout and shop administration and passenger handling procedure of Pan-American Airways base for flying boats at Port Washington, L. I. General description and site plan of the company's terminal at Baltimore, Md.

• MAJOR F. E. HULSE. *"Airport Development by Progressive Stages." Aero Digest,* Vol. 30, Feb. 1937, pages 42 and 44. General discussion and diagrams of stages in construction under two-to-five-year planning methods. The writer is Airport Engineer for A. P. Taliaferro, Jr., and Co.

• *"Some Aerodrome Buildings." Journal of the Royal Institute of British Architects,* Series 3, Vol. 43, April 4, 1936, pages 583 to 592. Five projects designed by Graham Dawbarn, Architect, at Birmingham, Jersey, Perth, Heston, and Northern Rhodesia. Site plans, floor plans, models, general description of projects. The one at Perth includes an air force reserve training school.

• JOHN DOWER. *"Architecture of the Airport." Flight,* Vol. 29, Jan. 30, 1936, pages 100 to 103. General description and views of airports at Hamburg, Lyon, and Gatwick, with discussion of the planning approach which they represent.

• *"Heston Airport." Architectural Review,* Vol. 78, Oct. 1935, pages 144 to 146. Plans, photos, general description of a large combined hangar and workshop building.

• *"Miami Airport:* International Air Terminal of the Pan-American Airways System." *Architecture,* Vol. 71, April 1935, pages 195 to 202. Plans and photographs of station building.

• *"Hamilton Field,* near San Francisco, California." *Architect and Engineer,* Vol. 121, April 1935, pages 10 to 19. Air view and other photos, general description of construction and mechanical equipment of a U. S. Army air base having a landing field, barracks, hospital, single houses for officers.

RUNWAYS, SURFACES, DRAINAGE, MARKING

Pamphlets, handbooks

• CLAY PRODUCTS ASSOCIATION. *Airport Drainage.* (Clay Products Association, 111 West Washington St., Chicago, Ill. 1939, 15 pages.) Discussion and diagrams of planning and installation of subdrains and surface intercepting drains. Runoff diagram and chart showing velocity and discharge for salt glazed vitrified clay sewer pipe and drain tile. Plan of drainage system of Akron Municipal Airport.

• W. R. MACATEE. *Asphalt for Airports: trends in the construction of runways and other airport surfaces.* (The Asphalt Institute, 801 Second Avenue, New York City, 1939, 47 pages.) Discussion of runway thickness requirements, asphalt surfacing, and soil stabilization, paving of parking lots, aprons, hangar floors, and many other items based on answers to a questionnaire received from a number of municipal, military, naval, and other authorities in charge of important air fields throughout the country. Plan, section, and statement of costs of runway surface for 34 airports. The author is District Engineer, the Asphalt Institute.

• CIVIL AERONAUTICS AUTHORITY. *Air Marking:* Bulletin No. 12. (Civil Aeronautics Authority, Washington, D. C., 1938, 28 pages.) Detailed information on construction, color, and letters for directional markers and for markers at airports.

• PREVOST HUBBARD and BERNARD E. GRAY. *Asphalt Pocket Reference for Highway Engineers.* (The Asphalt Institute, 801 Second Avenue, New York City, 1937, 237 pages.) Chapter on Airports discusses surfacing of runways, taxiways, aprons, and specifies type of asphalt for use in each case. The authors are, respectively, Chemical Engineer and Chief Highway Engineer of the Asphalt Institute.

• U. S. DEPARTMENT OF COMMERCE. *Report of Committee on Airport Drainage and Surfacing.* (U. S. Government Printing Office, 1932, 38 pages.) The general information on runway surfaces based on considerations of weight of the heaviest transport planes in use at the time of the report (24,000 pounds, in 1931) may be out-of-date. But the information on types, location, and size of drains for surface and subgrade drainage is still useful. The committee was composed of representatives of the Aeronautics Branch, Department of Commerce, the American Engineering Council, and the American Road Builders' Association.

Magazine articles

• A. A. ANDERSON and L. M. ARMS. *"Concrete Pavements for Airports." Aero Digest,* Vol. 35, Oct. 1939, pages 42 to 45. Detailed discussion of thickness, reinforcement, and jointing of concrete pavement with emphasis on differences from street and highway pavements. Authors are officers of the Portland Cement Association. Photos, plan.

• W. R. MACATEE. *"Construction of Runways and Other Airport Surfaces." Aero Digest,* Vol. 34, April 1939, pages 53 to 55. Detailed discussion with plans of types of asphalt runways at Cleveland, St. Paul, Hartford, Rochester, and many other city airports.

• A. M. MILLER. *"Low Cost Airport Runway at Morgantown, W. Va." Engineering-News Record,* Vol. 122, Jan. 5, 1939, pages 31 and 32. Plan, section, description of construction methods for a runway in which local materials (crushed limestone and sandstone) were used. Itemized costs.

• *"Salt Lake City Solves Airport Problem." Engineering News-Record,* Vol. 120, Jan. 6, 1938, pages 29, 30, 31. Diagrams and description of materials, construction methods, and drainage for a mile-long concrete runway and two asphalt runways.

• *"Development of an Inter-City Airport." Aero Digest,* Vol. 30, June 1937, page 36. Description of materials and construction methods for crushed granite surface macadam runways at a Vermont airport.

• H. E. COTTON. *"Methods of Subgrade Drainage." Roads and Streets,* Vol. 80, May 1937, pages 61 to 70. Description and diagrams of surface intercepting drainage system. The author is Drainage Engineer, Armco Culvert Manufacturers' Association.

• A. PENDLETON TALIAFERRO, JR. *"Modernizing the Rhode Island State Airport." Aero Digest,* Vol. 26, Feb. 1935, pages 24, 25, and 26. Plan, cross sections of concrete runways. Description of problems and planning for runway and drainage system.

EQUIPMENT AND FUEL SYSTEMS

Magazine articles

• *"Emergency and Miscellaneous Equipment for Airports." Aviation,* Vol. 35, July 1936, pages 85 and 86. General remarks on fire extinguishers, classes of fires, first aid equipment, and maintenance devices. List of manufacturers.

• *"Fueling Systems for Airports." Aero Digest,* Vol. 27, Nov. 1935, pages 22 and 23. Diagrams and description of the "Bowser" system consisting of a storage tank, pumping unit, and fueling pit box, and of the "Aqua" system in which water is admitted to the bottom of the storage tank and floats gasoline out of the top.

HANGARS

Magazine articles

• JOHN ERNEST KALINKA. *"Monolithic Concrete Construction for Hangars." Military Engineer,* Vol. 32, Jan.-Feb. 1940, pages 54 to 56. General discussion of barrel vault type of hangar. It is pointed out that in monolithic concrete structures, damage from direct bomb hits is localized.

• J. I. BYRNE. *"Hangar Door Design." Aero Digest,* Vol. 35, Oct. 1939, pages 49 and 50. Description of slide and canopy type doors and statement of advantages of the latter. The author is President, Byrne Doors, Inc.

• *"Hangar Provides Clear Space and Bomb Resistance."* *Architectural Record,* Vol. 84, Nov. 1938, pages 54, 55, and 56. The roof of this hangar, near Rome, consists of a system of segmental concrete ribs covered with terra cotta. Plans, section, photos.

• *"Concrete Walls as Counterweights."* *Engineering News-Record,* Vol. 119, Sept. 16, 1937, pages 478 to 480. Sections, elevations, and description of large hangars at San Francisco in which arch dead loads are counterbalanced by hanging walls from the steelwork.

• *"Aeroplane and Seaplane Hangar Design:* Modern German Practice." *The Builder,* Vol. 152, May 14, 1937, pages 1045 to 1047. General principles and space efficiency formulas for hangar design. Detailed description of lattice girder, rigid frame, and stressed skin roof construction commonly used in Germany. This is an abstract of a lecture by Dr. Alfred Memel, Head of Construction, German Air Ministry.

• *"Hangar Equipment."* *Aviation,* Vol. 35, July 1936, pages 78 and 79. Summary of types of standardized building units for hangar use, heaters, doors, lighting systems. List of manufacturers.

LIGHTING

Magazine articles

• WILLIS A. PENNOW. *"Electrifying Newfoundland Airport."* *Aero Digest,* Vol. 35, Oct. 1939, pages 70 and 73. Control room beacons, wind tee, contact lighting system at one of the largest airports in the Americas. The author is an employee of the Westinghouse Electric and Manufacturing Company.

• DALE W. ROE. *"Lighting System for Marine Air Bases."* *Aero Digest,* Vol. 34, Jan. 1939, pages 78 and 151. Typical air base layout. Photos and description of lighted marker buoy, lighting facilities on a fender, etc., as manufactured by Lights, Inc.

• WILLIS A. PENNOW. *"Adequate Airport Lighting."* *Aero Digest,* Vol. 33, Oct. 1938, pages 50, 51. Detailed description of lighting system required for a hypothetical airport near a city of 50,000 population and serving private and commercial operation.

• F. C. BRECKENRIDGE. *"Trends in Aviation Lighting."* *Transactions of the Illuminating Engineering Society,* Vol. 33, March 1938, pages 262 to 276. Development of aviation lighting considered with reference to growing importance of radio aids. American practice in design and placement of high angle beacons, approach, contact, boundary and obstruction lights compared with European practice. The author is associated with the National Bureau of Standards, and this publication is approved jointly by that organization and the Directors of the Bureau of Air Commerce in the Department of Commerce.

• H. C. RITCHIE. *"Recent Developments in Aviation Lighting."* *Transactions of the Illuminating Engineering Society,* Vol. 32, April 1937, pages 437 to 451. Developments in design and manufacture of beacons, boundary and obstruction lights, field floodlights, runway marker lights considered with relation to specifications of the U. S. Bureau of Air Commerce. Discussion. The author is an employee of General Electric Co.

• *"Lighting Equipment."* *Aviation,* Vol. 35, July 1936, pages 72 and 73. General remarks on types of equipment and trends in their use. List of equipment manufacturers.

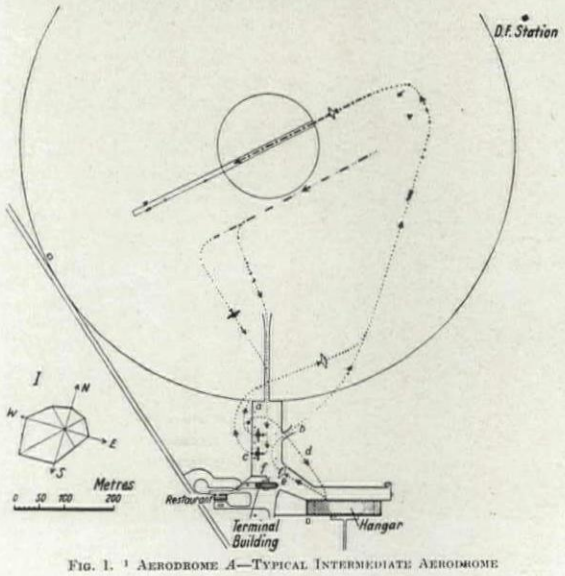


FIG. 1. [1] AERODROME *A*—TYPICAL INTERMEDIATE AERODROME

TWO DIAGRAMS AND AN ATTITUDE

The diagrams below are taken from *"Aerodromes: Their Location, Operation and Design,"* a German publication edited by Dr. Carl Pirath for the Scientific Institute for Air Transport Technical College, Stuttgart. (See "General Works" in the list.) They may represent an attitude which helps to win wars. Incidentally, this attitude seems to be lacking in commercial and governmental technical publication in the United States. Perhaps the lack ought to be made up.

Figure 1 shows existing conditions at one of the several German airports studied, while Figure 2 shows Dr. Pirath's suggestion for alterations. The book also contains time studies of mechanical inspection, fueling, embarkation of passengers, baggage loading, customs inspection, etc.

The resemblance of this mode of architectural and administrative analysis to that employed in the last days of the old Bauhaus is interesting. It suggests that despite all the nonsense about Blood and Soil preached at Nazi Party congresses, the old functional method of enquiry is still applied in technical matters. Indeed, in wartime an extended use of this method seems to have been called for. The most ironical contradiction in the *warlike* Nazi state arises out of the fact that the successful prosecution of a war requires intense exercise of intelligence—but intelligence cuts across the grain of Nazi racial and political doctrines. In modern warfare, requiring technical skill as it does, one must not only tell the soldiers *what* they must do but also the *why* of their actions.

I find that in the books and magazine articles published in America on the subject of airports, there is much concentration on *what* should be planned and *what* material should be used. The small emphasis on *why* anything should be done leaves the reader with the impression that he has no choice but to leave the fate of his projected airport to this expert or that manufacturer. There is a singular reluctance to get down to fundamentals. Even in government publications, and particularly in those of the Civil Aeronautics Authority, there is a cautious clinging to generalities so broad as to be completely meaningless. The planning expert has his patented system, the manufacturer has a material which can be used everywhere without question and the government avoids intruding on the territory of either.

Despite their doctrines of intellectual regimentation and in the interests of winning a war, the Nazis have been forced to allow free play to the unregimented method of functional analysis developed by the hated Bauhaus. It would seem that we here, being free of doctrines of regimentation, should find it easy to acquire this attitude toward planning problems, so essential in building an effective war machine. A. M.

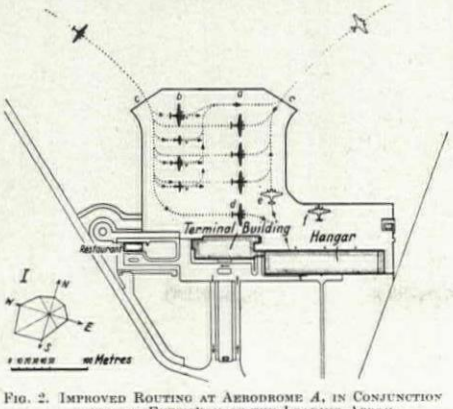
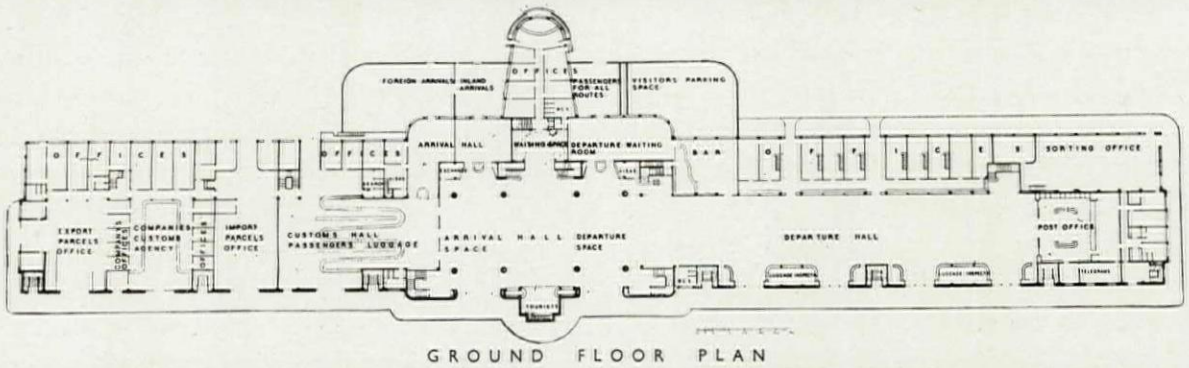


FIG. 2. IMPROVED ROUTING AT AERODROME *A*, IN CONJUNCTION WITH AN EXTENSION OF THE LOADING APRON



GROUND FLOOR PLAN

LE BOURGET AIRPORT, IN PARIS, DESIGNED BY GEORGES LABRO

AIRPORTS AS ARCHITECTURE

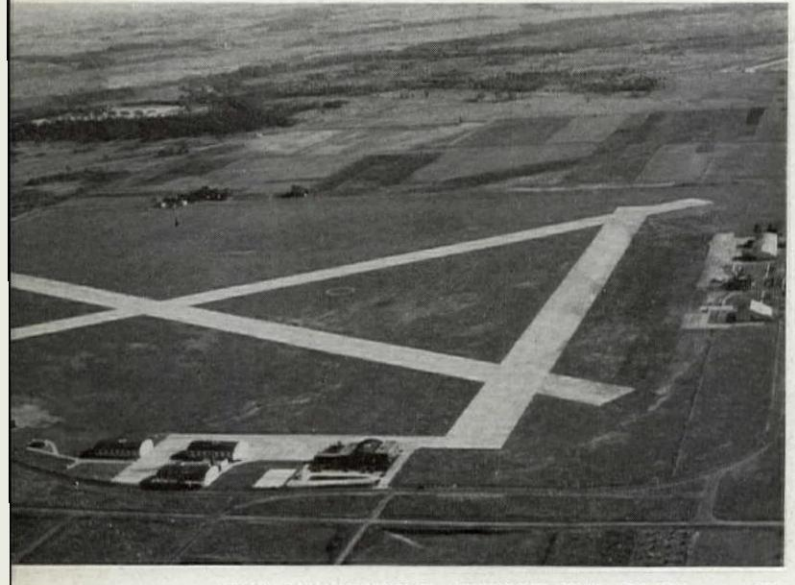
BY TALBOT F. HAMLIN

Form follows function in airplanes all right, but in all too much American airport building design it trails far behind, erratically, like a balky child behind its mother. It is difficult for me to understand exactly why this has been so, for airplanes have appealed to the imagination of the American people ever since Wright first sailed over the Kitty Hawk dunes. The airplane is to today's child what the automobile was to yesterday's, the railroad to the day-before-yesterday's, and the horse in the time before. Yet, confronted with the problem of designing suitable and adequate buildings for airport stations and airplane shelters, American architects seem to have all too often forgotten the lift and the enthusiasm they feel for the plane and to have turned back to the stodgiest, the most complicated, the most unfitting kinds of structures.

The problem is not new. Architectural magazines were devoting much space to airport buildings fifteen years ago, and the problem of the buildings themselves is not unduly complicated. What is a hangar but the largest possible enclosed and roofed area with the largest possible door openings? And the simple questions of circulation in an airplane passenger station should be child's play to the architects of a country that has boasted so long of the perfection of its much more complicated railroad stations. Part of the cause of the trouble lies in the fact that American architects were so slow in attacking the problem. Long after European cities had struggled, with more or less success, to give convenient and beautiful form to their airfield structures, Americans were content with the sloppiest, cheapest, most inconvenient temporary expedients. Even the buildings of the great airports in the United States, where the daily traffic far exceeded that in any of the famous foreign fields, were until recently an architectural disgrace; so that the American traveler in Europe was amazed and delighted by the quiet horizontality and gay restaurant areas of the old Tempelhof airport in Berlin and the magnificent long brick air station at Hamburg. While Americans were satisfied in hangar construction with the cheapest and most conventional, formless, and unthought-out sheds, the designers of Germany and France were busy with all sorts of inventive experiments in long-span concrete construction. Not all of these experiments were, of course, successful —many were awkward, overheavy, and expensive—yet the fact that they were made is significant. It shows that in Europe the challenge of airfield construction to architect and engineer was recognized long before its acceptance here. There is another important quality in much of this European work of ten or fifteen years ago: it seldom attempted to impose conventional form upon the new building types. The architects recognized at once that here was a brand new opportunity for creative thinking; here were demands unlike those which had ever been presented before. This at once put the whole problem on a sound basis, both æsthetic and practical. Meanwhile, the United States was making its own advances, not in airport buildings but in the fundamentals of airfield layout; and,

THE KANSAS CITY AIRPORT WAS BUILT IN 1939

BOWMAN FIELD, SERVING LOUISVILLE, KENTUCKY



THE MINNEAPOLIS AIRPORT WAS BUILT IN 1939
(PHOTOS BY PORTLAND CEMENT ASSOCIATION)

if the buildings of American airfields were and, alas, still are so often scandalously bad, the design of the fields themselves was progressing by leaps and bounds. The old, open, grassed airport has given way in America almost entirely to the safer, cleaner, more easily maintained runway airport; whereas even at Le Bourget, near Paris, where the station was completed but two years ago, the only hard, paved surface is the concrete apron connecting the hangars and the station proper.

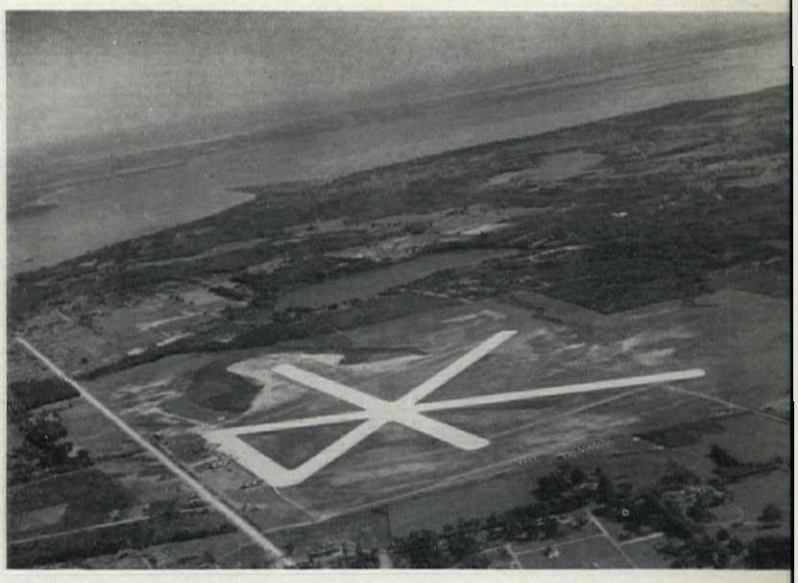
The general needs behind this runway field development are too well known to need extended comment. Planes must land and take off as nearly into the face of any wind as possible. The greater the wind, the shorter the run which is needed; yet, since there will be many days in which there is little or no wind, airports must be designed with a sufficient length of run to take care of windless landing or ascent. The modern heavy plane will tend to tear up any soft surface which is much used, to rut and gully it; and, if the use is intensive, it is almost impossible to keep it in turf. Another fact which is less known is that there has been in the past more damage to planes through accidents when they are already on the ground than when they are in the air—through collision, field roughness, and so forth. Now it is obvious that, if these things are so, the more plane taxiing is canalized, as automobiles are canalized by a road, the less chance there will be for accidents; and, if this traffic way is hard-surfaced, maintenance expense as well as danger to planes will be minimized.

The use of constantly heavier planes has produced a necessity for longer and longer runway distances; major fields now require runways over a mile long. The result of a careful study of all these requirements has led inevitably to the hard-surfaced runway airport, with the runways laid out after the most thoughtful consideration of prevailing winds, the surroundings of the field, and the relationship to buildings and services.

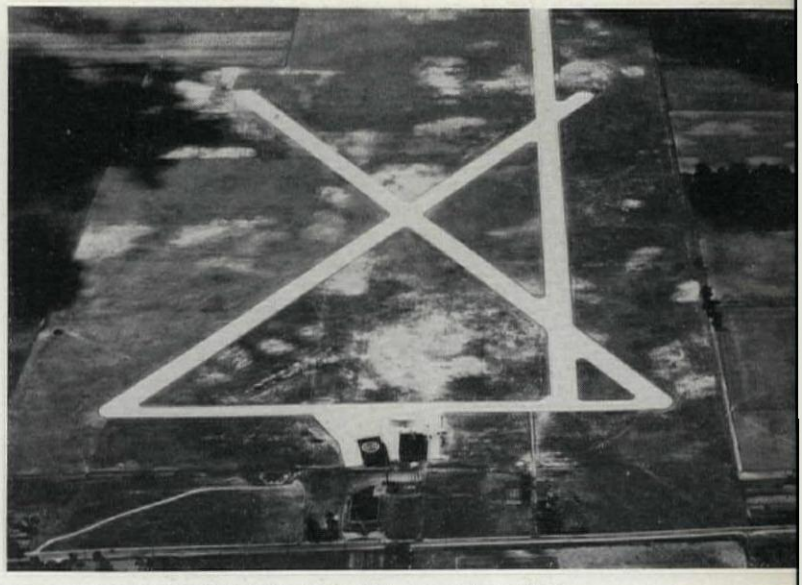
Since the need for landings or ascents with much crosswind should be minimized, and since in addition wind may come in any direction despite prevailing conditions (which

are only expressions of an average), the ideal airport might be roughly circular in plan, with four equal runways crossing it like the spokes of a wheel. This would give, of course, a maximum crosswind condition, under any circumstances, of only 22½°. Besides the runways themselves, a certain number of taxiing strips are desirable, in order to get planes off the runway as quickly as possible to clear it for other planes either coming or going; and these taxiing strips should be so laid out as to take the plane back to the apron and its approaches to hangar and station as simply as possible. Few cities have the requisite topography or the money for this ideal field, and the ingenuity that has been displayed in laying out fields which are approximations of it under all sorts of difficult conditions is excellent evidence of the skill and imagination of many æronautical engineers. Such airfields as the New York Municipal Airport at North Beach or the new Washington National Air Terminal now under construction may be considered, in all essential respects from the runway point of view, as entirely satisfactory. The great fault which occurs in most airports is lack of taxiing strips. Again and again planes have to use at least part of the runway on which they have landed in order to reach the building apron. If traffic on the port is intense, or if there is a sudden need for emergency landings, this condition is both inconvenient and dangerous. Sooner or later, as air traffic becomes more and more continuous, it will have to be remedied and ways found of getting planes off the runway at once.

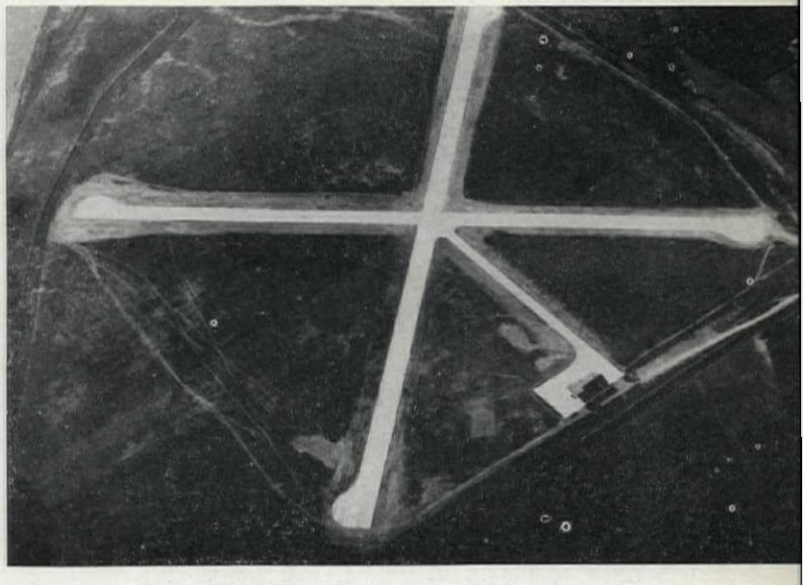
Nevertheless, the design of airfields is much more than a question of runways, with all their necessary border, approach, floodlighting, and other facilities which make them safe for planes; it is also a question of the complicated connections which must be furnished between the airfield with its buildings and the outside world. Here we get into the broadest kind of city planning considerations. How many people will use the port as a station? How many will come merely to watch? How will freight be routed to hangars and machine shops, so that planes can



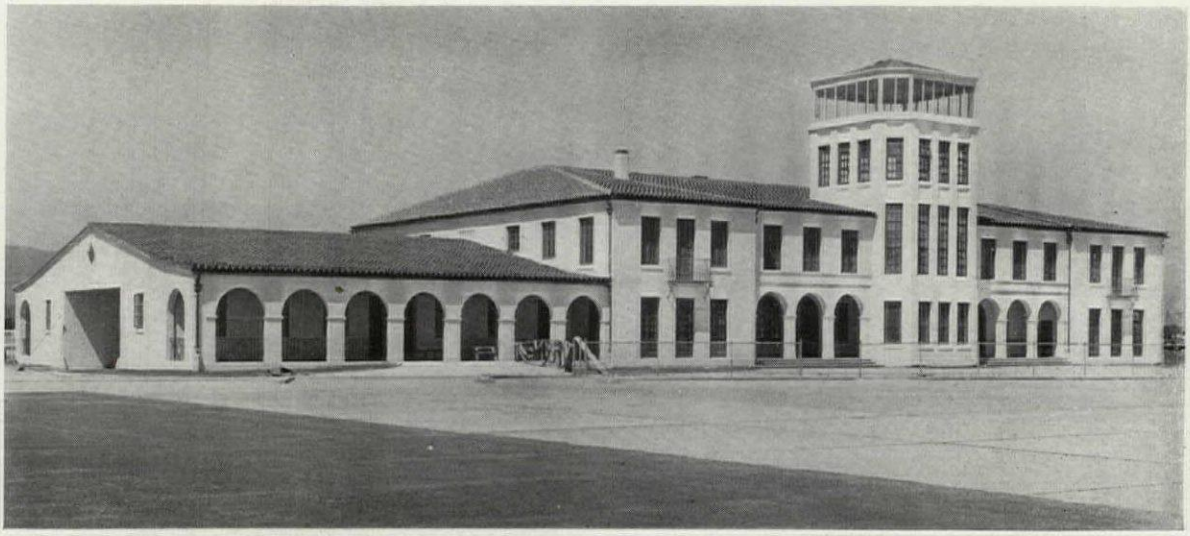
RHODE ISLAND STATE AIRPORT, BUILT IN 1935



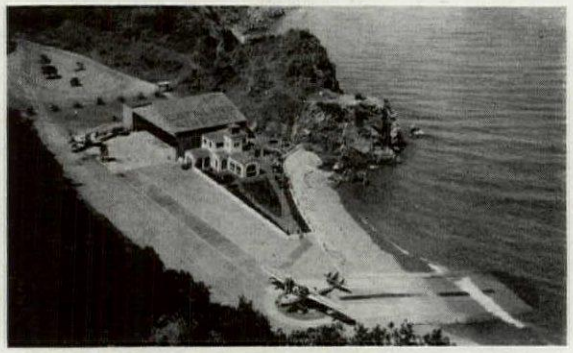
THE DAYTON MUNICIPAL AIRPORT, BUILT IN 1938



THE MUNICIPAL AIRPORT, ST. JOSEPH, MISSOURI
(PHOTOS BY PORTLAND CEMENT ASSOCIATION)



THE SAN FRANCISCO AIR TERMINAL. CAA PHOTO



CATALINA ISLAND, CALIFORNIA, SEAPLANE PORT

be easily and economically serviced? How many cars will have to be parked, and how can rail, bus, or rapid transit facilities be most easily furnished? How can the municipality or the state control the country around the airport, so that hazardous high structures may not be built to interfere with safe approach to the runways? These are all questions, as yet only partially solved, to which much additional study must be given before we may expect the ideal airport.

* * * *

But, if the general problem of airport layout, runway design, and the spacing and placing of buildings seems in this country fairly on the way to adequate solution, the story is a very different one when it comes to the design of the buildings themselves. We got off to a bad start. The problem became acute some ten years ago, just at a time when older standards had thoroughly disintegrated and newer, more logical approaches were still few and far between. To the average air station builder of those days the question seemed primarily one of "dolling up" the necessary. To what foolish extremes it ran only those who have seen the buildings can appreciate. Hangar sheds with tile-roofed Spanish arcades and mission church towers, like the Curtiss-Wright hangar at Los Angeles; terminal buildings in which Spanish arcades and antique roofs vie with modernist towers and entrances, like the Grand Central Air Terminal at Glendale, California, or the United Airport at Burbank, California—these were the rule in almost every case where "architecture" (that is, design beyond the mere cheap shed construction) was found at all.

There were exceptions — the commendable simplicity in the curved roof of the early Miami terminal of Pan-American, by Delano & Aldrich, and the long straightforward horizontals and honest steel cantilevers of the Curtiss-Reynolds Airport at Chicago, by Rebori & Wentworth. The little station building in the old Washington Airport, by Holden, Stott & Hutchinson, placed its curve-fronted observation tower simply and directly over a small rectangular structure pleasant in proportion and without ostentation, and quite adequate for the embryonic air traffic for which it was designed.

But the old attitude seems, unfortunately, still alive—the same kind of misreading and misunderstanding of all the lessons which modern architecture has taught, of truth to materials, of the creation of vivid new forms from new problems freshly conceived. The

THE SHUSHAN AIRPORT, NEW ORLEANS, LOUISIANA

same kind of feeling which over a decade ago piled up the Sky Harbor building of Chicago, like a solid Aztec pyramid, and created the false monumental classic symmetry of Randolph Field at San Antonio, today piles up on one of the most important sites on Manhattan Island an air terminal with its steel-supported 12-inch masonry pretending to be a mountain of solid cut stone carrying an enormous carved finial atop the whole! Why does this persistence of solid masonry architecture still so frequently curse the situation? It is so in the San Francisco Airport building, with its arcades; in the Shushan Airport, New Orleans, lavish and luxurious and frantically expensive, with its pylons and its panels; and even in the main station and administration building of New York's LaGuardia Field—not guiltless of the same superficiality in its ornamental details. The new airport on Treasure Island in San Francisco has, it is true, greater command and mass and plan, and expresses something of its concrete structure, though even here the ideal of solid masonry design of the old-fashioned type has, it seems to me, prevented a realization of the free and open beauty, the combined airiness, directness, and simplicity, which the new methods make possible for us. We must, it seems, be symmetrical at all costs, and, though we build in steel and concrete, aim to fool the people into thinking it is cut stone that we use—and less and less are people fooled, and more and more are they bored. How much better the simplicity

RANDOLPH FIELD, TEXAS (ARMY AIR CORPS PHOTO)

of the Chicago Municipal Airport, with its long windows and unashamed thin posts and spandrel walls! Only at the entrance, where the architects tried to go monumental by raising the door head unduly, does the old fault of false expression come in.

The new airport in Washington bids fair to be the best we have yet done; for, despite the symmetry and the classic spacing of its central portion, there is an interest in its masses which derives from the fact that they result from a careful study of its circulation needs and the functions it is to perform. The handling of its levels, the arrangement of its vast parking spaces, its long undercover landing walks for visitors, the simple way that traffic is routed at two levels so as to separate sightseers from passengers and trucks from passenger cars, the handling of the observation terraces on the field side, and the excellent restaurant designed so that diners may always have an unobstructed view—all of these have been allowed to

create forms natural to them, and then the whole has been integrated into a single composition. It is interesting to note that the same care which has controlled the building design is also evident in the careful handling of taxiing strips in connection with the runways, so that one great common fault of many otherwise good airports — confusion of landing and taxiing areas — is largely avoided.

I suppose that the furthest fields always seem fairest. There is perhaps among many of us—particularly those who wish for the best in design for our own country—a tendency to overvalue the foreign, the strange, and the different; nevertheless, even if we recognize this tendency, this acknowledgment should not blind us to the fact that, in air stations at least, we have still much to learn from what has been done in other countries. We may feel, perhaps, that in Le Bourget, the great airport of Paris, the entrance way has something of the over-monumentality of much of our own work; but we must also realize that in its daring shell-vault concrete construction, so frankly expressed in the way the Perret Brothers have made common in France, in its arrangement of observation tower and circulation and observation gallery and restaurant, it has a kind of true monumentality which results from its structural rhythms and its use. We may feel that expressionism has been forced in these foreign designs to an artificial point, as for instance in the Ramsgate Municipal Airport by D. Pleydell Bouverie, with its plan shaped like the wing of a modern transport plane and its observation tower pushed forward streamlined like a nacelle; yet in its simple concrete architecture and its wide clear open spaces of glass there is a quality of real architecture we might well emulate. And, though we may be aware that the gargantuan new Tempelhof buildings at Berlin (if they still stand) are monuments of the stupidest kind of official Nazi pseudo-classic, still we should also perceive that its extraordinary cantilevered shelter to the plane landing area—a cantilever projecting nearly 130 feet, so that the largest transports may be loaded under cover, with the top of the cantilever used as an observation platform with stepped seats—is evidence of a kind of creative structural daring which might not be out of place in some of our own airport designs. The London (South) Airport at Gatwick is in plan one of the most advanced and carefully studied airport buildings in the world, with its underground passage to the connecting railway station and its many exit doors with extension awnings so that several planes can be loaded at once. Its concentric cylinders, with the observation tower above, and its inclined glass windows create interesting form.

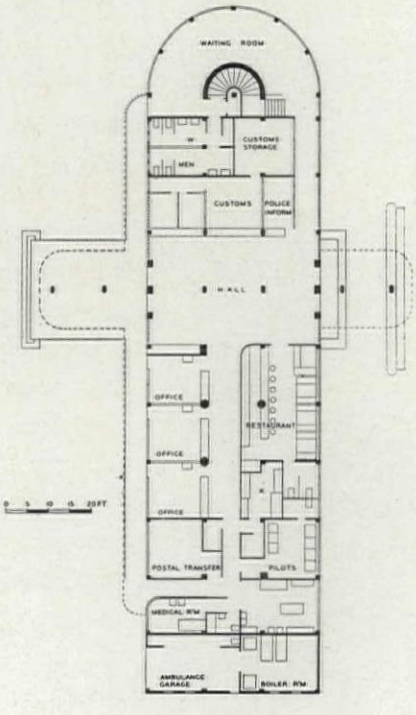
The same lessons can be read in any number of foreign airplane buildings, big and little —from that at Budapest, by Bierbauer and Kralik, to that at Mexico City by Fernando Puga. The Mexican terminal is particularly interesting in its straightforward concrete posts and slabs and its use of glass block and plate glass where each serves best. It is interesting to see how the same spirit shown in the dynamic yet simple exterior forms carries through the details within. Not a large building, it has distinction in spite of evidences here and there of unstudied detail—a distinction which results from the fact that it is so definitely and so simply itself.

There is something of the same quality in the administration building of the Grand Rapids Airport in our own country, and for the same reason—the fact that its character has grown so directly from the concrete of which it is built. Here again, as in so many of the American buildings, the road front is less successful than that toward the field; for the old conventions of monumental stone design creep almost imperceptibly into the façades of buildings, and in this case neither the lettering itself nor the grilles in front of the windows are distinguished or forceful enough to carry the importance which their placing gives them. Yet the field side, with its curved corners, its large glass areas, its simple posts, and the direct way the forms combine together, has undeniable distinction.

* * * *

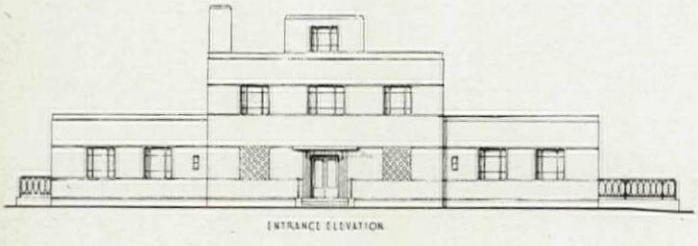
The growth in airplane passenger service has been so colossal in the last few years that

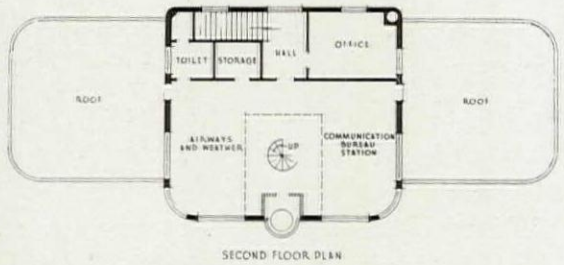
THE NEW AIRPORT BUILDING AT MEXICO CITY DESIGNED BY FERNANDO PUGA IS PARTICULARLY INTERESTING BECAUSE OF ITS STRAIGHTFORWARD USE OF CONCRETE, OF GLASS BLOCK, AND PLATE GLASS WHERE EACH SERVES THE NEED BEST. THE SIMPLE EXTERIOR FORMS CARRY THROUGH THE DETAILS WITHIN, AS SHOWN BY THE PHOTOGRAPHS HEREWITH FURNISHED BY PAN AMERICAN AIRWAYS. THE SIMPLICITY OF THE LAYOUT IS EVIDENT FROM THE FIRST FLOOR PLAN (BELOW) REPRODUCED FROM ESTHER BORN'S INFORMATIVE BOOK, "THE NEW ARCHITECTURE IN MEXICO"



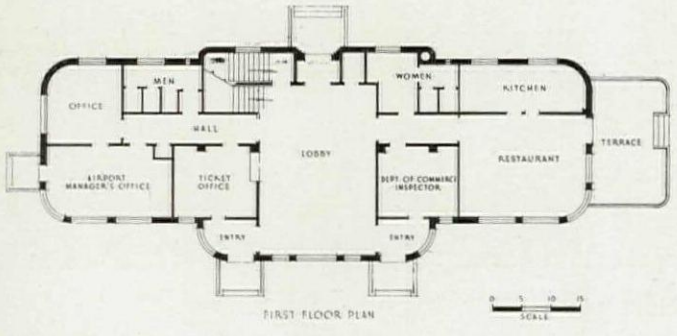
ADMINISTRATION BUILDING OF MEXICO CITY MUNICIPAL AIRPORT, DESIGNED BY FERNANDO PUGA

THE CONCRETE CONSTRUCTION OF THE NEW AIRPORT BUILDING (1940) OF THE KENT COUNTY AIRPORT AT GRAND RAPIDS, MICHIGAN, IS EXPRESSED WITHOUT AFFECTATION AS SHOWN BY THE WPA PHOTO ABOVE, WHICH WAS FURNISHED, WITH THE PLAN BELOW, BY F. SPENCER WEBER, ENGINEER, FROM THE FILES OF THE PORTLAND CEMENT ASSOCIATION. THE FIELD FACADE WITH ITS SIMPLE POSTS, ITS LARGE GLASS AREA, AND ROUNDED CORNERS IS PARTICULARLY SUCCESSFUL, SINCE ALL FORMS HAVE BEEN COMBINED WITH DISTINCTION


ENTRANCE ELEVATION



SECOND FLOOR PLAN

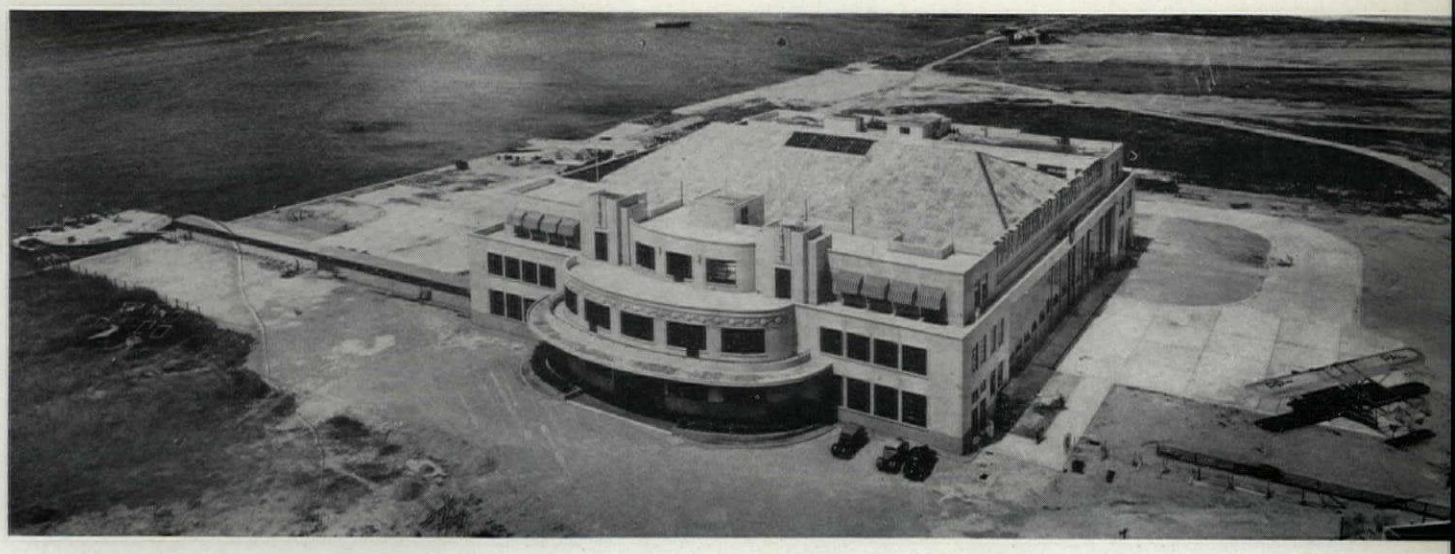


FIRST FLOOR PLAN

only recently has it been possible to write a program for an air station that would not be out-of-date in a dozen months. Now, however, the problem is fairly definite; the rate of future growth may be approximated, and building sizes thus determined. Hangars must be enormous; the superb open sweeps and great lifting and folding doors of the hangars at New York's LaGuardia Field are none too large. Their very scale guarantees them a certain effectiveness, provided they are treated simply in fitting materials.

The needs of the station are of course more complex, and the difficulty again and again has been that of adjusting the necessarily human scale of the buildings for passengers with the tremendous dimensions of the shelters for planes. But again the problem is not insoluble; it is rather one of character, so that each shall be obviously that which its purpose indicates, and the mind makes the necessary adjustments. Hence the difficulty of combining hangar and station in one building, which cursed so many of the earlier designs and even later structures—like the Rio de Janeiro Pan-American terminal, with its overdecorated projecting curved bay seeming so insufficient against the great bulk of the hangar building itself.

The term "air terminal" is, of course, in one sense a misnomer, for essentially the airplane station is a junction between two differing forms of transit. Because of their need for space, airports are frequently at some distance from city centers; passengers arrive at them by truck, or car, or sometimes

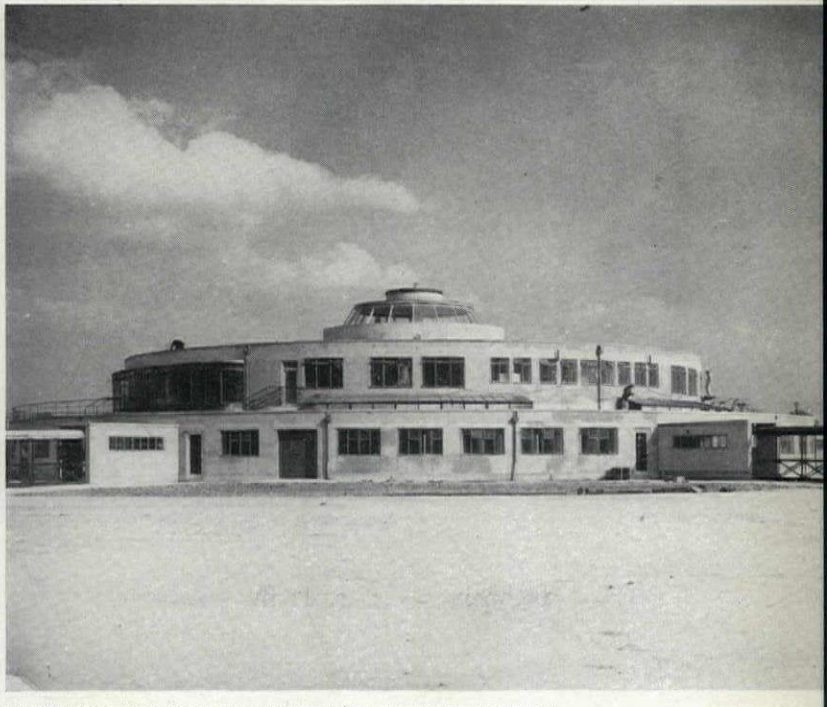


PAN AMERICAN TERMINAL AT RIO DE JANEIRO

even by train. And the adjustment of the needs of the two forms of transportation, so that the flow from one to the other shall be direct and simple, is the first principle in planning. Moreover, since many large air stations are also ports of entry, customs facilities must be furnished in such a way as to interrupt the flow as little as possible and make the examination of baggage easy.

Now, most of these requirements can be paralleled in railroad station design, and many of the principles there developed hold true for airline buildings as well; yet there are two most important differences. The first lies in the fact that the airplane takes only a small fraction of the number of people that a train does. The whole plan must therefore be laid out for the rapid handling of quite small groups of people, which may succeed each other almost continually, but will never create the mass congestion for which a railway station has to be designed. The air station may need as many parts as a railroad station, but each one of them is almost always much smaller in area. And there is little need for those enormous concourses to distribute hurrying traffic which is at the basis of the effect of so many large railroad stations. The result is almost always a building of smaller scale, less monumental dimensions, and greater complexity than the railroad station. Much of the difficulty with American airports has been the attempt to give these new and smaller buildings the monumentality people have come to associate with the railway station. The airplane

AIRPORT TERMINAL AT SALT LAKE CITY, UTAH



GATWICK, LONDON, ENGLAND (THE TIMES PHOTO)

station must be as modern as the transport it serves; and to give the passenger, as he enters the station, something of a foretaste of the beauty of this quality should be one of the great aims in airplane station design.

The second great difference between the airplane station and the railroad station lies in the fact that airports are fascinating and beautiful things in themselves; that almost everyone still gets and apparently will continue to get a feeling of some brilliant excitement and pleasure at the sight of bright metal planes landing and taking off, or alighting on the water; and that people will throng from far and near to see such a sight, to get the particular release from everyday limitations which this glimpse affords them. To take care of these crowds, who have really nothing to do with the actual air traffic, is as much a function of the complete air station as is the handling of the passengers themselves. Restaurants have become important sources of income to the airport, and have established themselves as popular resorts. Terraces from which the sightseeing public can watch the exciting doings on the airfield, and to which it can come without interrupting the flow of regular passengers, furnish opportunities for architectural design of the greatest ingenuity, and their long lines and openness create repose and effect. The air station is fortunate, too, in having as one essential requirement a glassed observation room for traffic control, so designed that it commands not only the entire airport but also the sky—if possible, in every direction. This in many ways is the most important part of the whole plan, for on its efficient functioning will depend the safety of the planes alighting or taking off. It can be treated in any number of beautiful ways. Its open glazed sides make a light and interesting climax to the whole design; if the windows are inclined to increase the view upward, it becomes a sort of glazed cupola, a new and exciting motif based on the needs of the new traffic. It must be placed high enough to give the necessary view; but, since airfield buildings should themselves be low, so as to make approach to the field safe and preserve adequate gliding angles, any resemblance to the old tower must be sedulously avoided.

Perhaps it is in this very demand for low structures that a basis may be found for the real beauty of the modern airport. All of the best existing air stations have emphasized horizontal lines; it is this which gives their character. The new air station at Santos Dumont Field in Rio de Janeiro is a vast improvement over the seaplane hangar and Pan-American terminal at the same field, for here the lesson of horizontality seems to have been learned; and one of the things which sets apart the design for the Washington air terminal from most of its predecessors is the horizontal quality given by its projecting shelter slabs and the carefully planned stepped terraces on the field side, so designed that the people on them do not interfere with the view of those in the restaurant or waiting room.

We are bound to see a vast increase in the number of air stations built in this country during the next few years. Airplanes have become an accepted method of passenger travel, no longer adventurous expedients which require only the cheapest and flashiest of buildings. Air travel has come of age; air station design must come of age too, and, forgetting the silly mistakes of the past, the attempts to hang historical stage scenery around hangar and station alike, it must go on to design by the most rigorous examination of building needs, the most free and creative integration of its services, the most brilliant and unconventional use of new materials. It took the railroads of this country half a century to learn the requirements of a railway station, although good designs had been produced in Europe within ten years after the railroads were accepted means of transportation. Something like the same thing has been going on in the airplane design field. Now that we have gotten over our childhood and made our experiments, valuable or silly, it is time to get down to the design of air stations which *are* air stations and nothing else—buildings which shall be as beautiful and efficient as the shining planes themselves.

PENCIL POINTS DATA SHEETS

Prepared by DON GRAF, B.S., M.Arch.

DISREGARD OF THE OBVIOUS

In the September 1934 issue of *The American Home* there appeared an article giving the home owner fairly complete instructions on how to be his own architect. We quote:

Strolling through the rooms and indicating "this for father, this for mother, this for Phyllis" is bad practice in determining how well the existing plans suit the needs of your family. You're sure to forget closets, another needed bathroom, or some other space that is certain to upset haphazard calculations. A simple way to avoid careless estimates of space requirements is to sketch the existing plans on graph paper, using as a scale one square equal to a 5½ or an 11 shoe, depending upon your sex and your pediatral similarity to Greta Garbo or Primo Carnera. As you pace off the floors you make your plan drawings, not forgetting to indicate windows and doors. . . . It will be worth your while to consult with the local plumbers to learn whether any of them had made repairs recently enough to know anything about the system.

You can draw your own plans but when it comes to plumbing, you should CONSULT YOUR PLUMBER! Here are a few additional nonsense items for our third chukker in the game of Phooey on Architects.

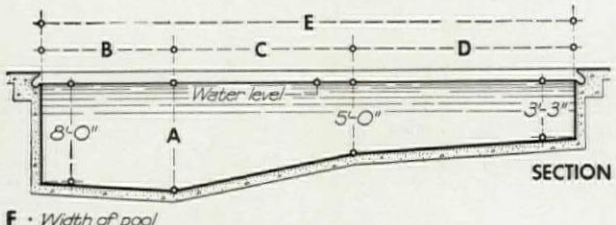
". . . The easiest way to begin is to find an excellent stock plan that is 'just right' for your family's needs and the budget . . . If you would like to know how to obtain house plans, check the coupon on this page." —*New York Herald-Tribune*, June 9, 1940

". . . Johnny, fresh from the Beaux Arts, applied for a position with them and got it. Three years to 1934, and Johnny's twenty-sixth birthday. Johnny

SWIMMING POOL SIZES AND CAPACITIES

Index No. **D2i** PLANNING

PENCIL POINTS DATA SHEETS PREPARED BY DON GRAF



F · *Width of pool*
Q · *Approximate number of people at one time*
8Q · *Maximum daily load*

No inflexible standard exists for the dimensions of swimming pools. On *Data Sheet* D2h were given figures which are at slight variance with those shown on this *Data Sheet*. Swimming pools constructed from either sets of figures would be satisfactory for official sports events or for ordinary recreational activities.

SET 18 OCT 1940

The number of people admitted to the pool at one time is given in the table and is subject to variation, depending upon ages of the swimmers. For simultaneous use by small active boys and dignified older persons, the limit could be very much lower than that given—since a sense of overcrowding would result. If all the swimmers are of the same age, a larger number of users at one time would be tolerable.

The maximum daily load and the capacity of the pool in gallons are given to facilitate calculations involving water purifications, drainage and supply.

"STANDARD" SWIMMING POOL DIMENSIONS

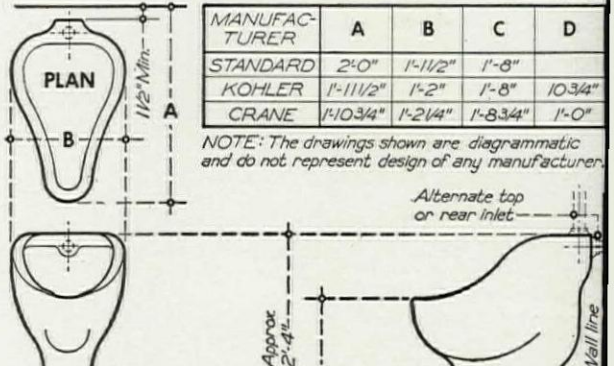
A	*B*	*C*	*D*	*E*	*F*	*Gallons*	*Q*
9′	15′	20′	25′	60′	20′	55,000	32
9′	15′	20′	40′	75′	25′	80,000	42
9½′	18′	25′	47′	90′	30′	120,000	75
10′	18′	25′	62′	105′	35′	155,000	100
10′	20′	30′	70′	120′	40′	207,000	130
10′	20′	30′	85′	135′	45′	248,000	170
10′	20′	30′	100′	150′	50′	310,000	250
10′	20′	30′	130′	180′	60′	420,000	360
10′	20′	30′	160′	210′	70′	558,000	490

Courtesy The Permutit Co.

PEDESTAL AND TROUGH URINALS

Index No. **D6i** PLANNING

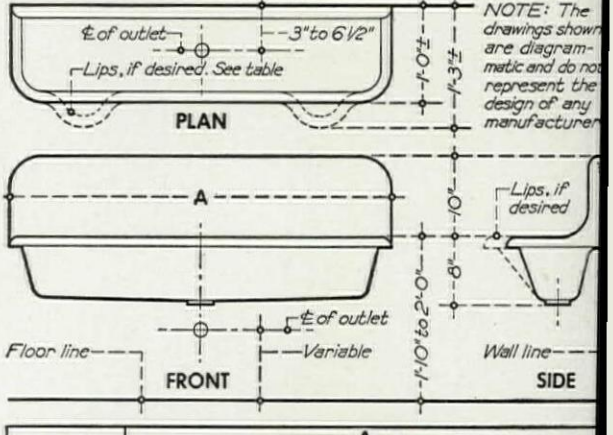
PENCIL POINTS DATA SHEETS PREPARED BY DON GRAF



MANUFACTURER	A	B	C	D
STANDARD	2'-0"	1'-11½"	1'-8"	
KOHLER	1'-11½"	1'-2"	1'-8"	10¾"
CRANE	1'-10¾"	1'-2¼"	1'-8¾"	1'-0"

NOTE: The drawings shown are diagrammatic and do not represent design of any manufacturer.

SET 18 OCT 1940



MANUFACTURER	A											
	2'-0"		2'-6"	3'-0"		3'-6"	4'-0"		5'-0"		6'-0"	
	Plain	1 lip	Plain	Plain	2 lips	Plain	Plain	2 lips	Plain	3 lips	Plain	4 lips
STANDARD	●	●		●	●		●	●	●		●	
KOHLER		●			●			●		●		●
CRANE	●	●	●	●	●	●	●		●	●		

ENAMELED IRON TROUGH URINAL

was earning in the neighborhood of ten thousand dollars a year and saving five; his car, his clothes, his golf clubs were impeccable . . ."

—*Collier's*, August 18, 1934

"In addition to the organizations listed above, many of the state colleges also have house plans available, particularly for farm houses. A number of the leading newspapers publish floor plans, descriptions and illustrations of houses. Some of the architectural, building and home magazines (which may be consulted in large libraries) also publish similar information."

—*U. S. Department of Commerce*
Letter Circular LC-428

"Build it yourself—with shears and paste pot. You will find this novel plan for designing your house actually more fun than a jigsaw puzzle and infinitely more instructive, especially if you are cherishing a dream picture of the little Colonial house you would like to build. Complete color patterns . . ."

—*The American Home*

"Architects are too prone to relegate all service openings or doors to the kitchen, and expect to arrive at a workable layout. Do not in any case plan to have *your* entry door, cellar door or garage door enter the kitchen . . ."

—*Good Housekeeping* Bulletin

"Barbara fitted into the neat set of mental blueprints by which Stuart's neat, careful life was being lived. They were very complete, those mental blueprints. They had told Stuart, long before he had taken his degree in architecture, that he was to work in Prentiss and Wright's big New York office. They had told him that at thirty he would be earning eight thousand a year, and would marry; and they told him, too, precisely the sort of girl he would marry, and exactly where to find her. And when, three days before Stuart's thirtieth birthday, his salary was raised to eight thousand dollars, he sat down and wrote a long letter to his Aunt Grace . . ."

—*McCall's*, August 1934

AIRPORT DESIGN CHECK LIST

Index No. **D 7 p** PLANNING

PENCIL POINTS DATA SHEETS PREPARED BY DON GRAF

LANDING AREA
- Size and Design
- Grades
- Drainage
- Surfaces
- Runways

APPROACHES
- Zoned Area
- Freedom from Obstructions

MARKING
- Boundary Markers
- Obstruction Marking
- Identification Marker
- Runway Marking

LIGHTING
- Beacons
- Boundary and Range Lights
- Obstruction Lights
- Floodlighting
- Contact Lights
- Instrument-landing Lighting
- Course Light
- Building Interior Lighting
- Instrument Lighting
- Emergency Power Supply
- Remote Control
- Miscellaneous Requirements

AIRCRAFT SERVICING FACILITIES
- Fuel
- Repairs
- Storage

TRAFFIC CONTROL FACILITIES
- Control Tower
- Airport Traffic Control Room Equipment

BUILDINGS
- Terminal
- Passenger & Administration
  - Waiting Room
  - Rest Rooms
  - Dining Rooms
  - Ticket Office
  - Post Office
  - U. S. Weather Bureau
  - Airways Communication Office
  - Administration Offices
  - Employee Facilities
- Hangars
- Additional Buildings

OTHER FACILITIES
- Aprons, Taxiways and Loading Areas
- Road, Parking Lot, and Fence
- Facilities for Visiting Public
- Fire Protection Equipment
- First-aid Facilities
- Wreckage Equipment

LOCAL NBFU INSPECTION AND RATING BUREAUS

Index No. **F 17 a** CONSTRUCTION

PENCIL POINTS DATA SHEETS PREPARED BY DON GRAF

Alabama: Alabama Inspection and Rating Bureau.....Montgomery
Arizona: Arizona Equitable Rating Office.....Phoenix
Arkansas: Arkansas Fire Prevention Bureau.....Little Rock
California: Board of Fire Underwriters of the Pacific....San Francisco
Colorado: Mountain States Inspection Bureau.....Denver
Connecticut: New England Fire Insurance Rating Assn..Boston, Mass.
Delaware: Middle Department Rating Assn.....Philadelphia, Pa.
District of Columbia: Underwriters Assn. of D. C.....Washington
Florida: Florida Inspection and Rating Bureau.....Jacksonville
Georgia: Georgia Inspection and Rating Bureau.....Atlanta
Idaho: Idaho Surveying and Rating Bureau.....Boise
Illinois: Chicago Board of Underwriters (for Cook County)....Chicago
Illinois Inspection Bureau (for rest of State).....Chicago
Indiana: Indiana Inspection Bureau.....Indianapolis
Iowa: Iowa Insurance Service Bureau.....Des Moines
Kansas: Kansas Inspection Bureau.....Topeka
Kentucky: Kentucky Actuarial Bureau.....Louisville
Louisiana: Louisiana Rating and Fire Prevention Bureau..New Orleans
Maine: New England Fire Insurance Rating Assn.....Boston, Mass.
Maryland: Association of Free Underwriters (for Baltimore, Canton, Highlandtown and within 5 miles of Corporation limits) Baltimore
Middle Department Rating Assn. (for rest of State) Philadelphia, Pa.
Massachusetts: New England Fire Insurance Rating Assn.....Boston
Michigan: Michigan Inspection Bureau.....Detroit
Minnesota: Fire Underwriters Inspection Bureau.....Minneapolis
Mississippi: Mississippi State Rating Bureau.....Jackson
Missouri: Missouri Inspection Bureau.....St. Louis
Montana: Board of Fire Underwriters of the Pacific
Butte, Mont. and San Francisco, Calif.
Nebraska: Nebraska Inspection Bureau.....Omaha
Nevada: Board of Fire Underwriters of the Pacific, San Francisco, Calif.
New Hampshire: New Hampshire Board of Underwriters.....Concord
New Jersey: Schedule Rating Office of New Jersey.....Newark
New Mexico: Mountain States Inspection Bureau.....Denver, Colo.
New York: New York Fire Insurance Rating Organization
New York, Syracuse and Buffalo
North Carolina: North Carolina Inspection and Rating Bureau..Raleigh
North Dakota: Fire Underwriters Inspection Bureau
Fargo, N. D., and Minneapolis, Minn.
Ohio: Ohio Inspection Bureau.....Columbus
Oklahoma: Oklahoma Inspection Bureau.....Oklahoma City
Oregon: Oregon Insurance Rating Bureau.....Portland
Pennsylvania: Middle Department Rating Assn.
Philadelphia and Pittsburgh
Rhode Island: New England Fire Insurance Rating Assn., Boston, Mass.
South Carolina: South Carolina Inspection and Rating Bureau, Columbia
South Dakota: Fire Underwriters Inspection Bureau
Sioux Falls, S. D., and Minneapolis, Minn.
Tennessee: Tennessee Inspection Bureau.....Nashville
Texas: Texas State Fire Insurance Comm. (State maintained rating body).....Austin
Texas Inspection Bureau (inspection organization of insurance companies).....Dallas
Utah: Board of Fire Underwriters of the Pacific
Salt Lake City, and San Francisco, Calif.
Vermont: New England Fire Insurance Rating Assn.....Boston, Mass.
Virginia: Virginia Insurance Rating Bureau.....Richmond
Washington: Washington Surveying and Rating Bureau.....Seattle
West Virginia: West Virginia Inspection Bureau
Charleston, W. V., and Columbus, Ohio
Wisconsin: Fire Insurance Rating Bureau.....Milwaukee
Wyoming: Mountain States Inspection Bureau.....Denver, Colo.

THE MONOGRAPH SERIES

Records of Early American Architecture

RUSSELL F. WHITEHEAD, A. I. A., *Editor*
FRANK CHOUTEAU BROWN, F. A. I. A., *Associate Editor*

Volume XXVI • Number 5

VIEW THROUGH ARCHWAY
SECOND STORY STAIRCASE HALL
THE GARDNER-WHITE-PINGREE HOUSE
Samuel McIntire, Architect
SALEM, MASSACHUSETTS

DOORWAY WITH OVAL TOPLIGHT IN ENTRANCE HALL
EDWARD CARRINGTON HOUSE—C.1811—PROVIDENCE, RHODE ISLAND

[162]

SOME INTERIOR ARCHED OPENINGS

found in NORTHEASTERN COLONIAL *work*

Photographs by Arthur C. Haskell

THE use of the arch form as interior decorative detail executed in wood, while not exactly frequent in New England, nevertheless seems to have been employed quite often—particularly in those houses having the most architectural importance. To be of any magnitude, it is perforce limited to houses of an unusually high stud, especially when used to span wider distances, or when employed in anything approaching a semi-circular form. Its most frequent early uses were, perhaps, in terminating the upper part of the corner cupboard (to which more particular attention will be directed in the next following Monograph), but it was also sometimes used for interior round-topped doorways—as in the Warner House at Portsmouth—1722 (Vol. XVIII, No. 5). Sometimes these archways were filled with glazed doors or sash, as in the double doorway from the Lee-Nichols House in Cambridge; or the upper part of the wall cupboard from the Elisha Smith House, in Stillwater, Rhode Island. For more pretentious toplight examples, the elaborately glazed arched opening in the George Read, II, House, from New Castle, Delaware, or the Doorway in the Music Room of the John Brown House at Providence (Vol. XXII, No. 1), with the semi-circular tympanum filled with an elaborately carved pattern in wood relief, might serve as illustrations.

The circular or elliptical cross-Hall archway—especially in the Southeastern coastal regions—has always been a favorite employment, either to suggest a separation of a rear from a front continuous hallway; to set apart a recess containing a stairway from the main open hall—though with less frequency of use—for an opening between a hall and a main first floor room, or even to partly join or connect a front and a rear parlor.

In demarking a staircase recess, it has even been used in a doubled form, as in Gunston Hall, Fairfax County, Virginia (Vol. XVI, No. 3) and in the entrance hallway of "Tulip Hill," Anne Arundel County, Maryland (Vol. XVII, No. 6). In yet another southern mansion, Wye House, in Talbot County, Maryland (Vol. XVI, No. 5), flattened and elliptical arched top openings were used in several instances—along the Hallway, as well as between adjoining rooms.

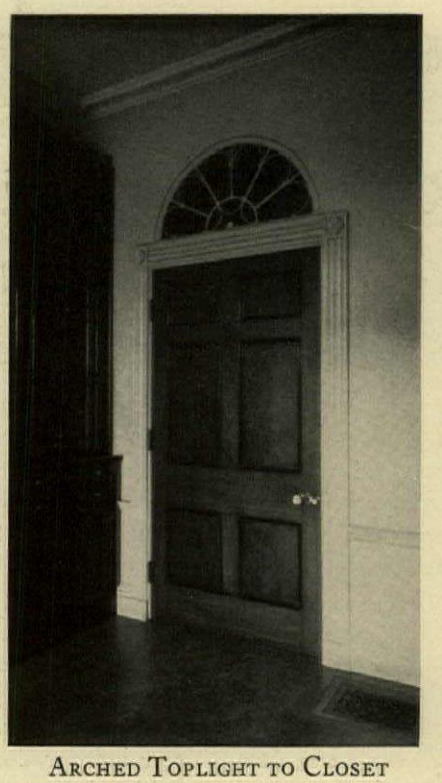
In the George Read, II, house at New Castle, Delaware (Vol. XI, No. 6) not only was the hallway interrupted along its length by two large and elaborately decorated semi-circular archways; but a number of richly patterned glass toplights were used to fill arched openings extending over the wide doorways between interior rooms, as well as above the entrance. These interior doors with arched toplights might be considered even as an endeavor to both "have one's cake and eat it too"; to secure the richness of the arch feature, while at the same time maintaining separation of the rooms. An even more naive use is seen in the Jonathan Woodbridge house (page 171), built in a still more northern clime — in Hampshire County, Massachusetts—in 1806. Here the necessity for conserving heat during a large part of the year probably motivated the arrangement — which was obviously planned and built all at the same time; to separate a front from a rear hall, where the staircase was located off the rear hall space, and therefore the need for a practicable connection existed the year around.

In fact, it must by now have become apparent that the location of the archway in the hall is perhaps its most universal usage. A number of examples from northeastern locations were recently illustrated in the issue given to Staircases and Entrance Hallways (Vol. XXV, No. 2). In this location—midway the Hall's length — the archway is usually elliptical, and actually serves to focus interest upon the stairway, located behind it, that it thus visually enframes and emphasizes.

Among the considerable number of cross Hallway arches shown in that issue, were those in the Sarah Orne Jewett, Col. Isaac Royall, Jerathmael Bowers, and Capt. Gregory Purcell houses, along with the quite unique example from the Coleman-Hollister house. While the John Vassall House, in Cambridge, supplies still another example (Vol. XXIII, No. 5) that, most unusually, springs from brackets on the

side walls of the Hall that, in their turn, are set against the faces of small paneled pilasters extending from the floor.

Even more frequently, the arched top opening is found utilized in New England in a location under the upper run of the main stairway —or under its intermediate wide landing — thus providing both a special feature in the lower hallway and a partial support for the stairway construction thrown across above it. Instances of its use in this location have also been illustrated rather frequently within recent years, and another example, from the Saltonstall house; demolished some twenty years ago, at Haverhill, Mass., is here shown as it appeared, both from the front hall as well as looking through the archway from the further entrance.



ARCHED TOPLIGHT TO CLOSET
39-40 BEACON STREET—1818—
BOSTON, MASSACHUSETTS

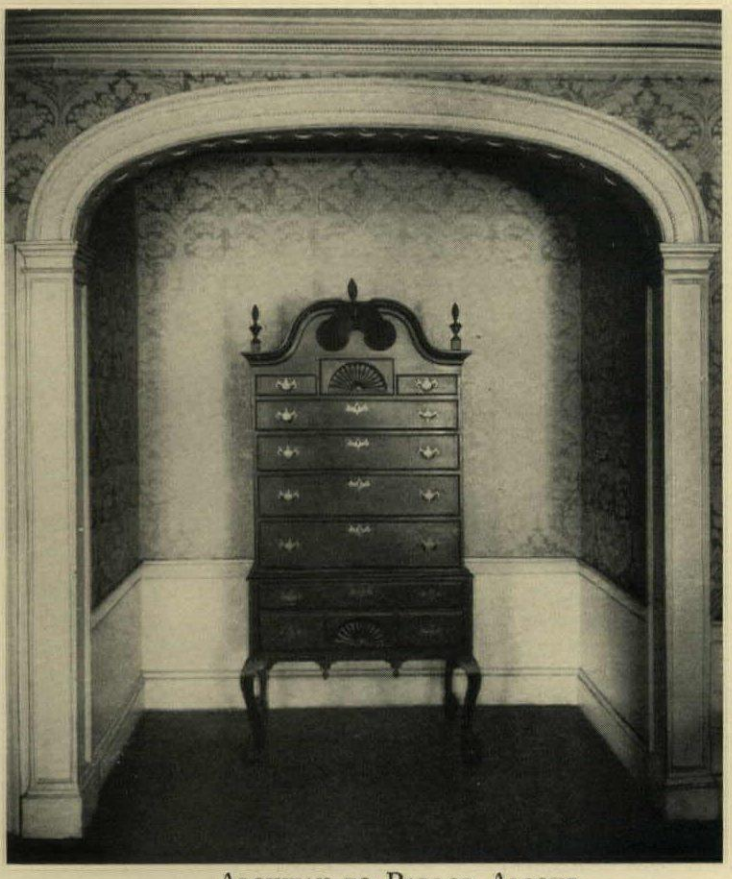
Besides this limited yet distinctive group, usually found in dwellings dating from the middle of the Eighteenth Century; with the beginning of the Century following, there appear a few smaller types that possess unusual charm and delicacy of detail and treatment. Instead of springing across a wide central Hallway, at a location in front of the end hall staircase—these smaller archways are placed at the opening of side or intersecting corridors, that allowed them to be both narrower and smaller in scale than the more sturdy and wider-flung ones that had preceded them. While the former type actually often performed a structural purpose, in concealing a heavy cross beam or tie, these later types are used almost exclusively for their decorative value; and the four examples—pages 167-170—of different dimensions, proportions and detail, all attributed to Samuel McIntire, are those that have been used as models for most of the variants derived from them.

ARCHED RECESS FORMERLY IN REAR PARLOR
AMORY-TICKNOR HOUSE—1804—BOSTON, MASS.

The use of arches upon each side of a central fireplace, to cover recessed alcoves, is also found in a few New England dwellings. Sometimes it is as simple and bold a treatment as in the 1780 portion of the Col. William R. Lee House at Marblehead (Vol. XXIV, No. 3) where it is most unusually a full half-circle in outline; or, more usually, as an elliptical arch, in the example from an old Charlestown, Massachusetts, house (page 176) that was in process of demolition even as these measurements were being taken, in 1934. In this instance, the same general treatment was employed in two separate parlors—in the one the archways framed recessed windows, and in the other, doorways. A still more ornate and elaborate treatment was employed in the West Parlor of the Vassall-Craigie - Longfellow house, 1759, at Cambridge, Mass. (Vol. XXIII, No. 5), as well as in the Sargeant - Murray - Gilman - Hough house, 1768, at Gloucester, Mass. (Vol. XX, No. 5), while the builders of the Royall House, at Medford, utilized similar—though sim-

pler — motives on more than one of its floors.

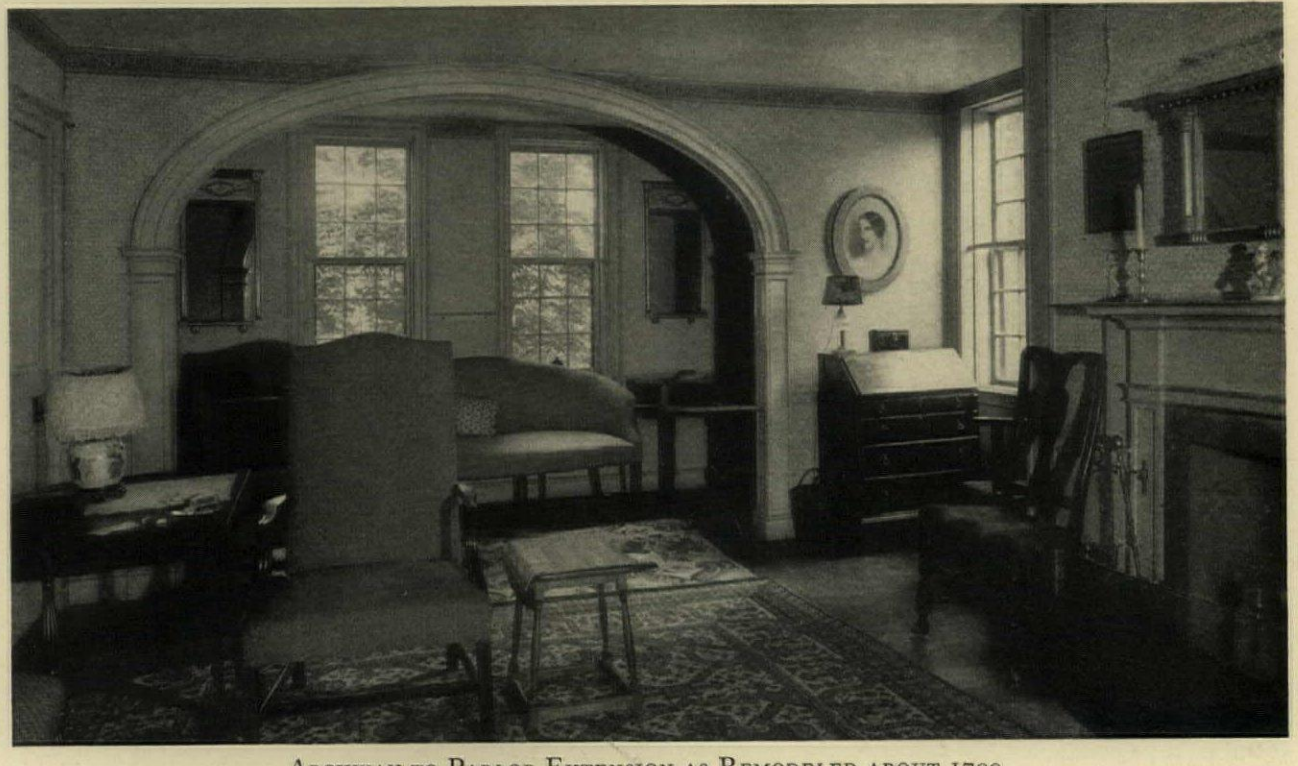
In the Gloucester house just mentioned, as was also the case in another old house—now in use as the Gloucester Town Library — a single circular headed window was placed directly in the center of the Hallway over the main stair landing. This employment was similar to that in the Sarah Orne Jewett House, at South Berwick, Maine (Vols. XXV, No. 6, and XXVI, No. 1), while, in a still more elaborate and decorative form, the *Monograph* has already illustrated what ar eprobably the best two examples in New England —in the Jeremiah Lee Mansion, at Marblehead (Vol. XIX, No. 5), and in "The Lindens," formerly at Danvers (Vol. XXV, No. 6).



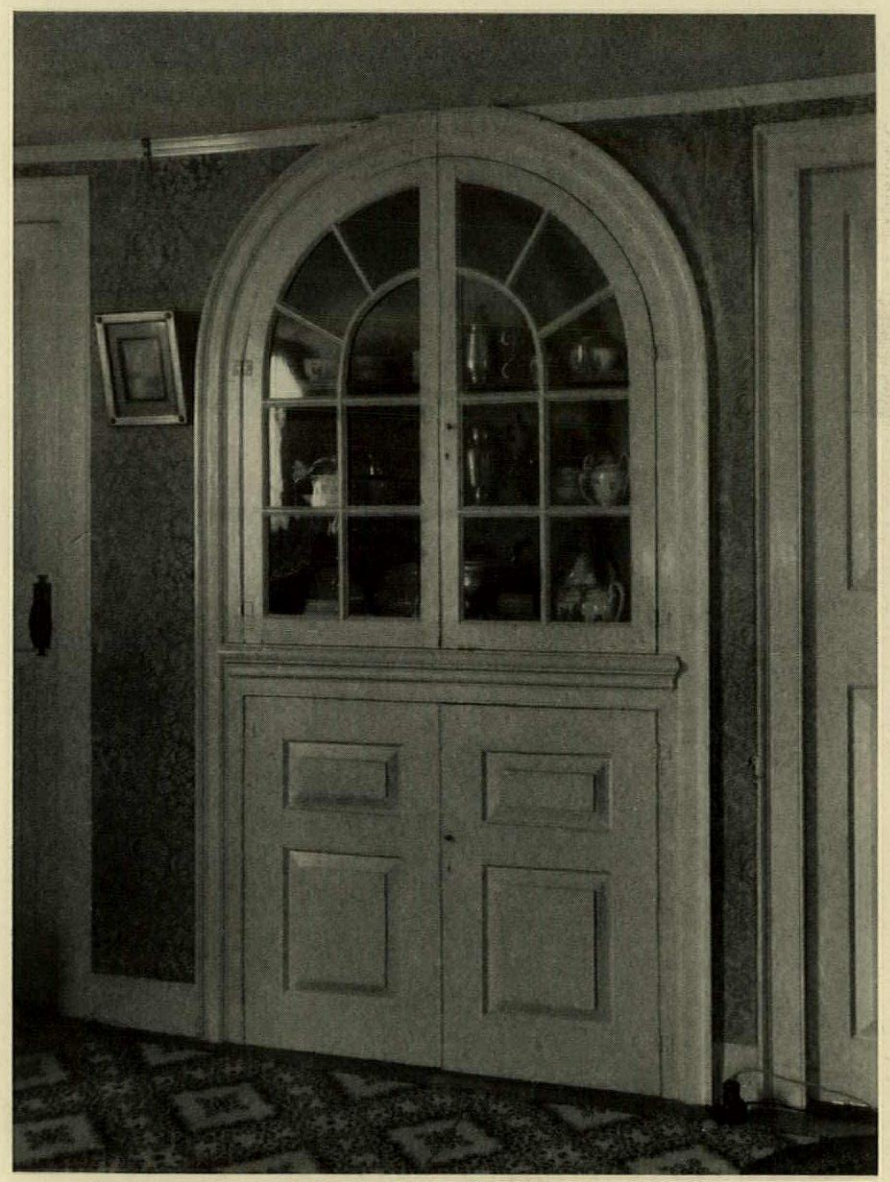
ARCHWAY TO PARLOR ALCOVE
92 WASHINGTON SQUARE, SALEM, MASS.

And still other uses for circular sash openings have been devised. To light an inner closet, a semi-circular toplight, a circular window (or even an octagonal one!) can be employed. While, in plan, the slightly recessed niche with arched top, commonly used for a statuary figure, occurs in many hallways of the early Nineteenth Century.

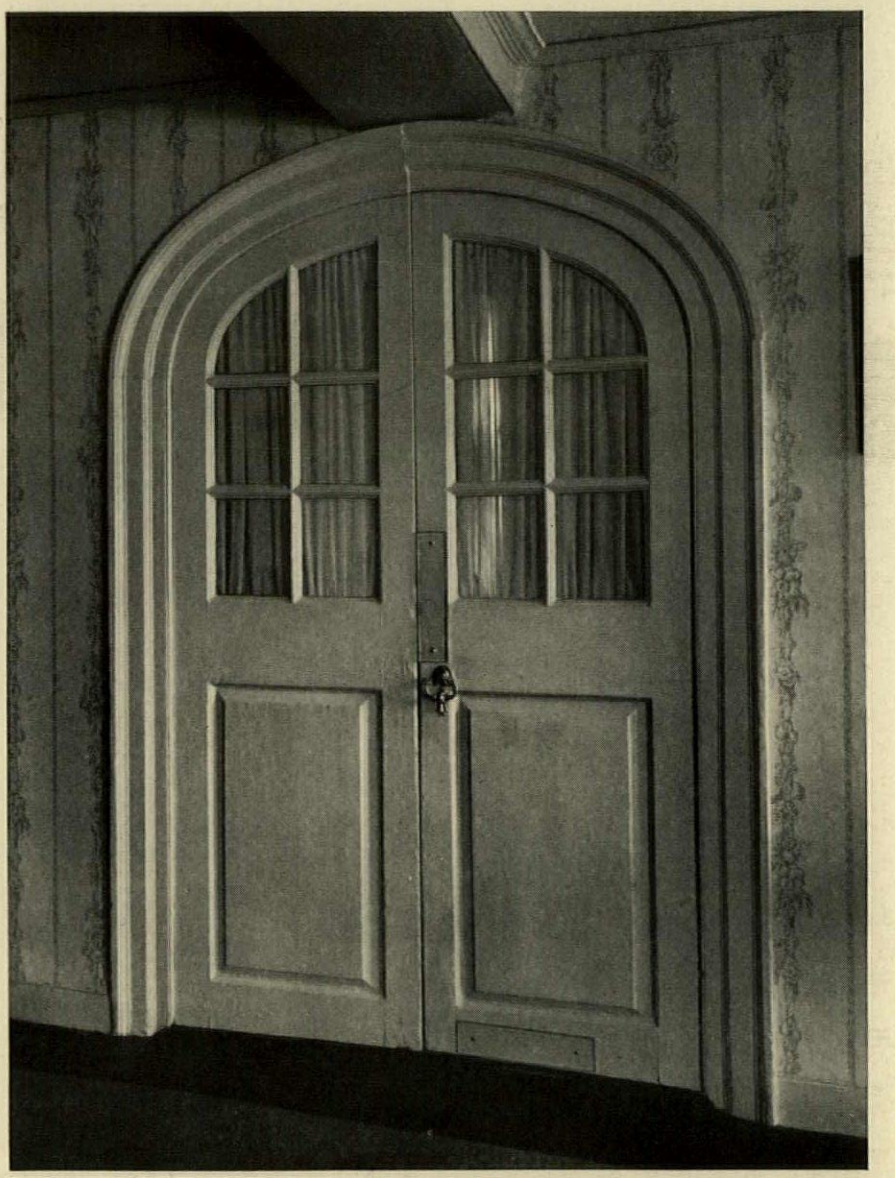
FRANK CHOUTEAU BROWN, F. A. I. A.



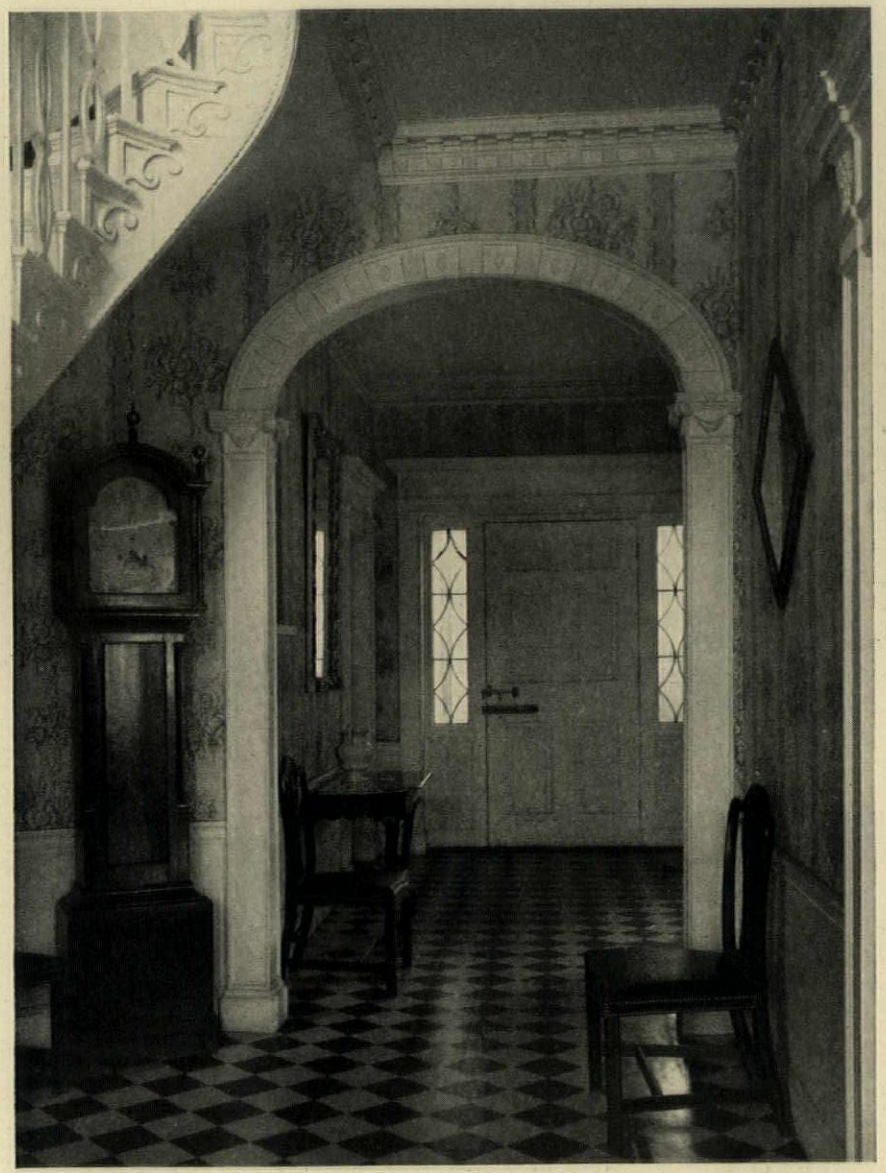
ARCHWAY TO PARLOR EXTENSION AS REMODELED ABOUT 1799
HUNTINGTON HOUSE—1752—HADLEY, MASSACHUSETTS



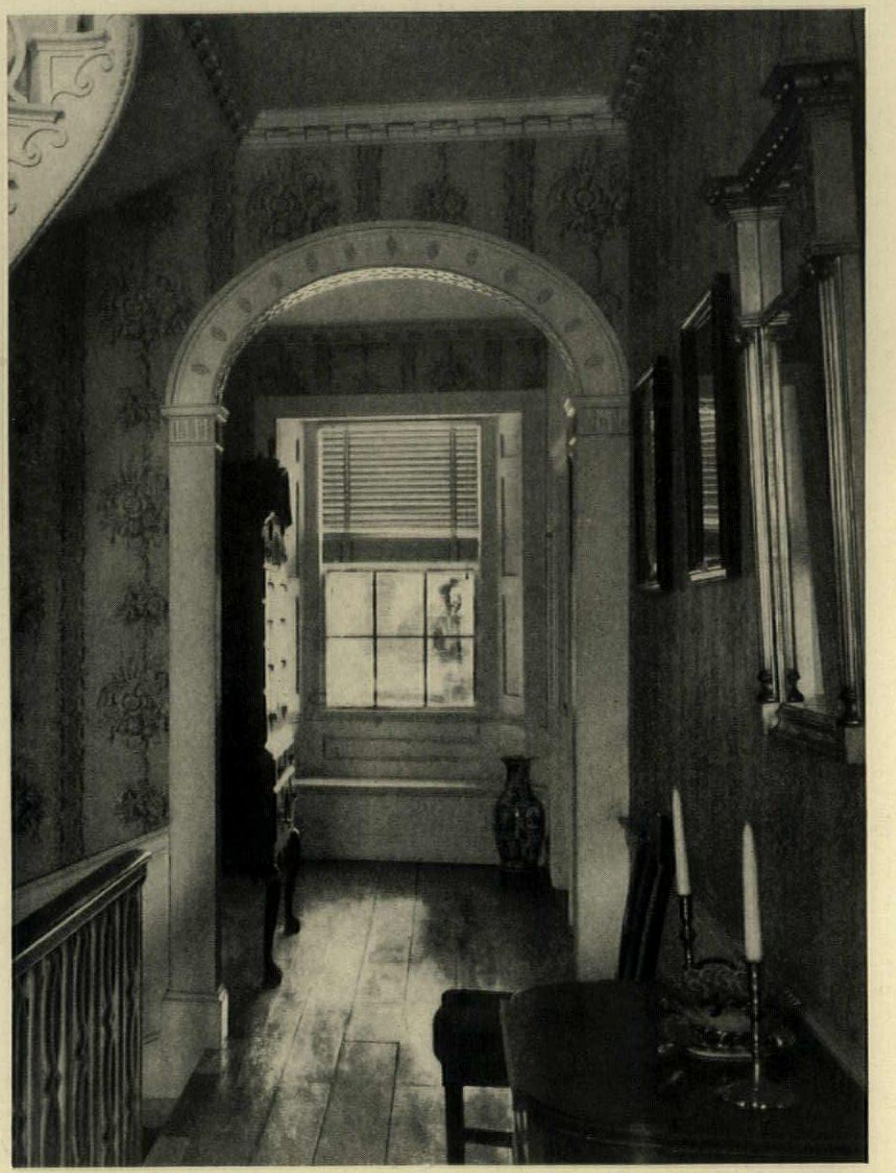
ARCHED WALL CUPBOARD
ELISHA SMITH HOUSE—STILLWATER, RHODE ISLAND



ARCHED DOUBLE DOORWAY
LEE-NICHOLS HOUSE—1660—CAMBRIDGE, MASSACHUSETTS



ARCHWAY, STAIRCASE HALL TO FIRST FLOOR REAR ENTRY

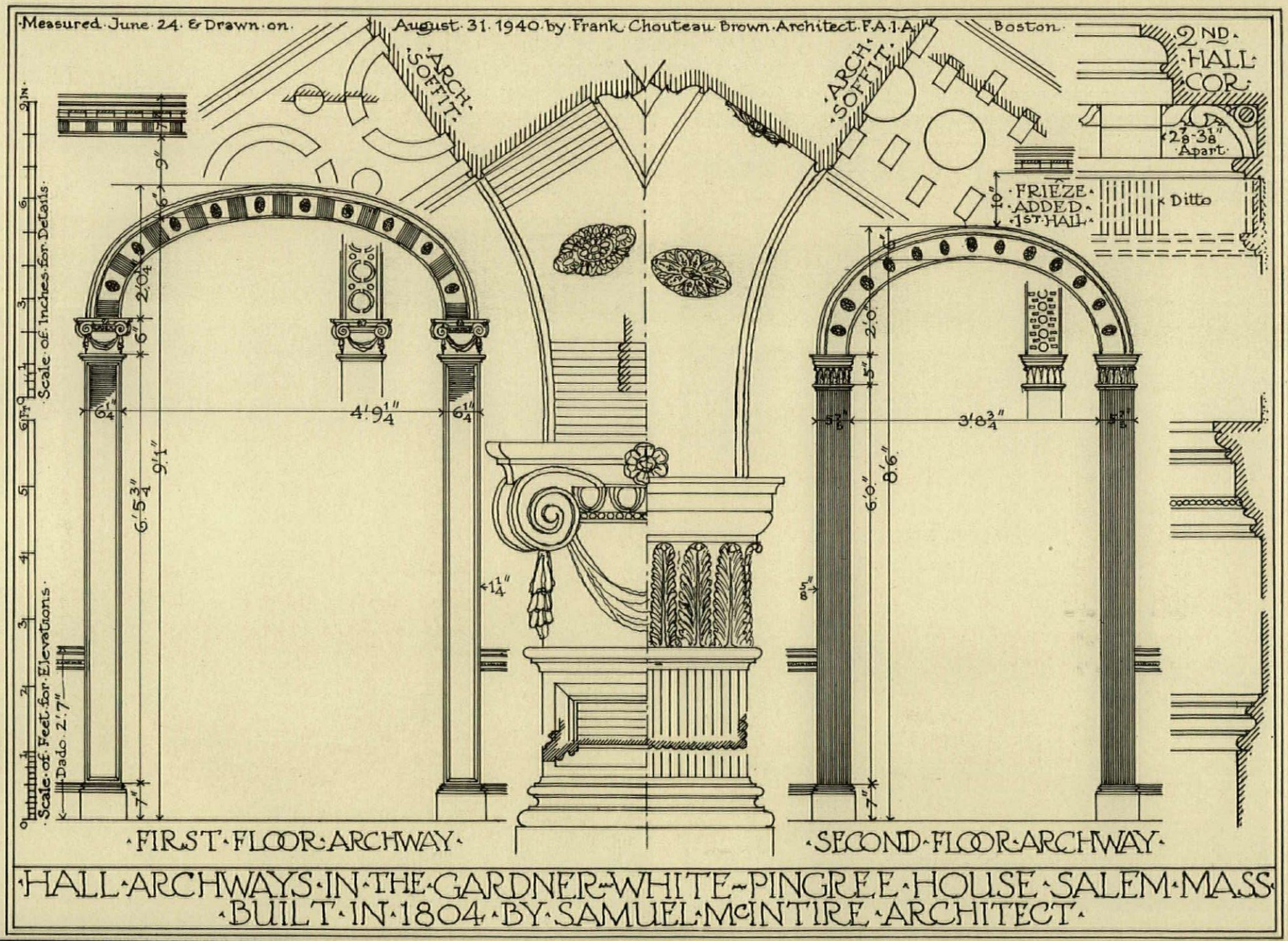


ARCHWAY, STAIRCASE HALL TO SECOND FLOOR REAR CORRIDOR

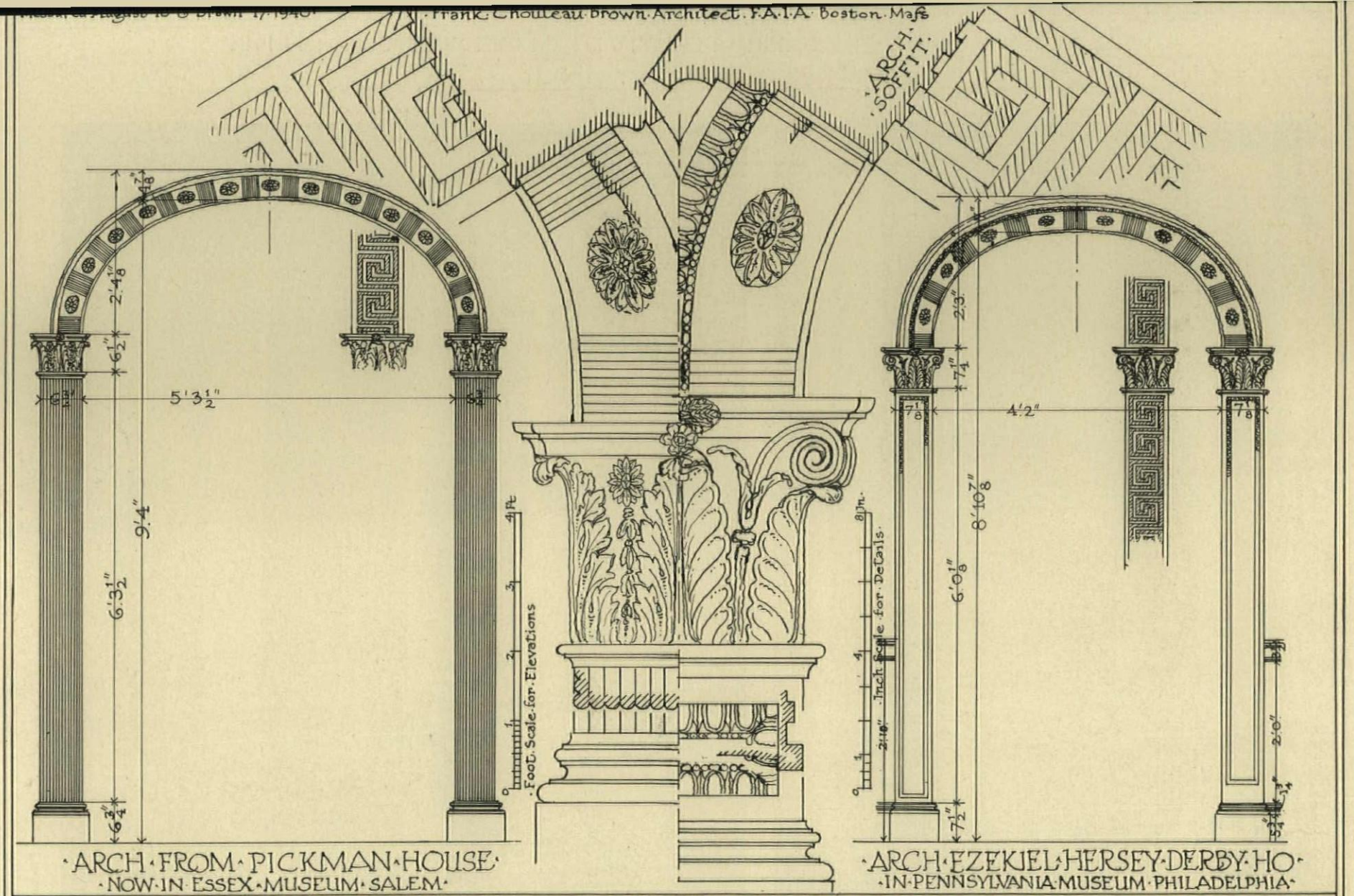
GARDNER-WHITE-PINGREE HOUSE—1804—SALEM, MASSACHUSETTS

Samuel McIntire, Architect

[891]



HALL ARCHWAYS IN THE GARDNER-WHITE-PINGREE HOUSE SALEM MASS
BUILT IN 1804 BY SAMUEL McINTIRE ARCHITECT



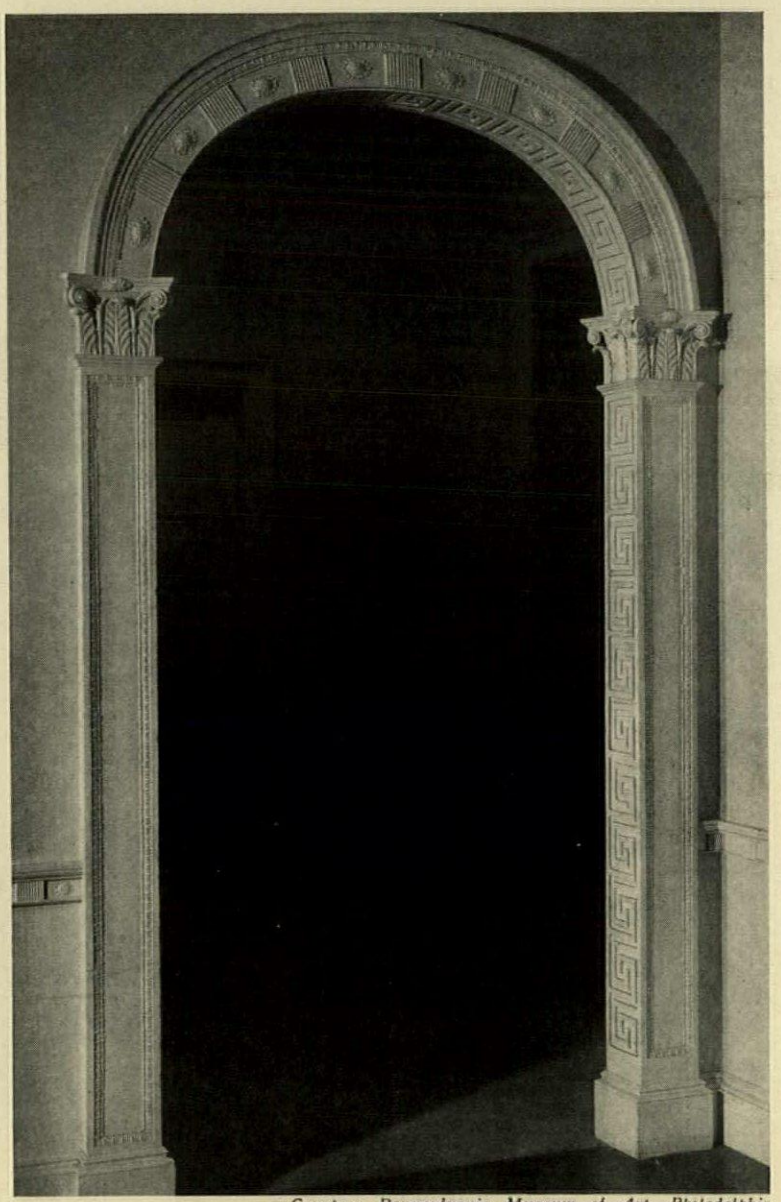
ARCH FROM PICKMAN HOUSE
NOW IN ESSEX MUSEUM SALEM

ARCH EZEKIEL HERSEY DERBY HO
IN PENNSYLVANIA MUSEUM PHILADELPHIA

TWO HALL ARCHWAYS FORMERLY IN DWELLINGS IN SALEM MASS
ATTRIBUTED TO SAMUEL McINTIRE

Courtesy Essex Institute

HALL ARCHWAYS IN ORIGINAL LOCATION, BEFORE REMOVAL

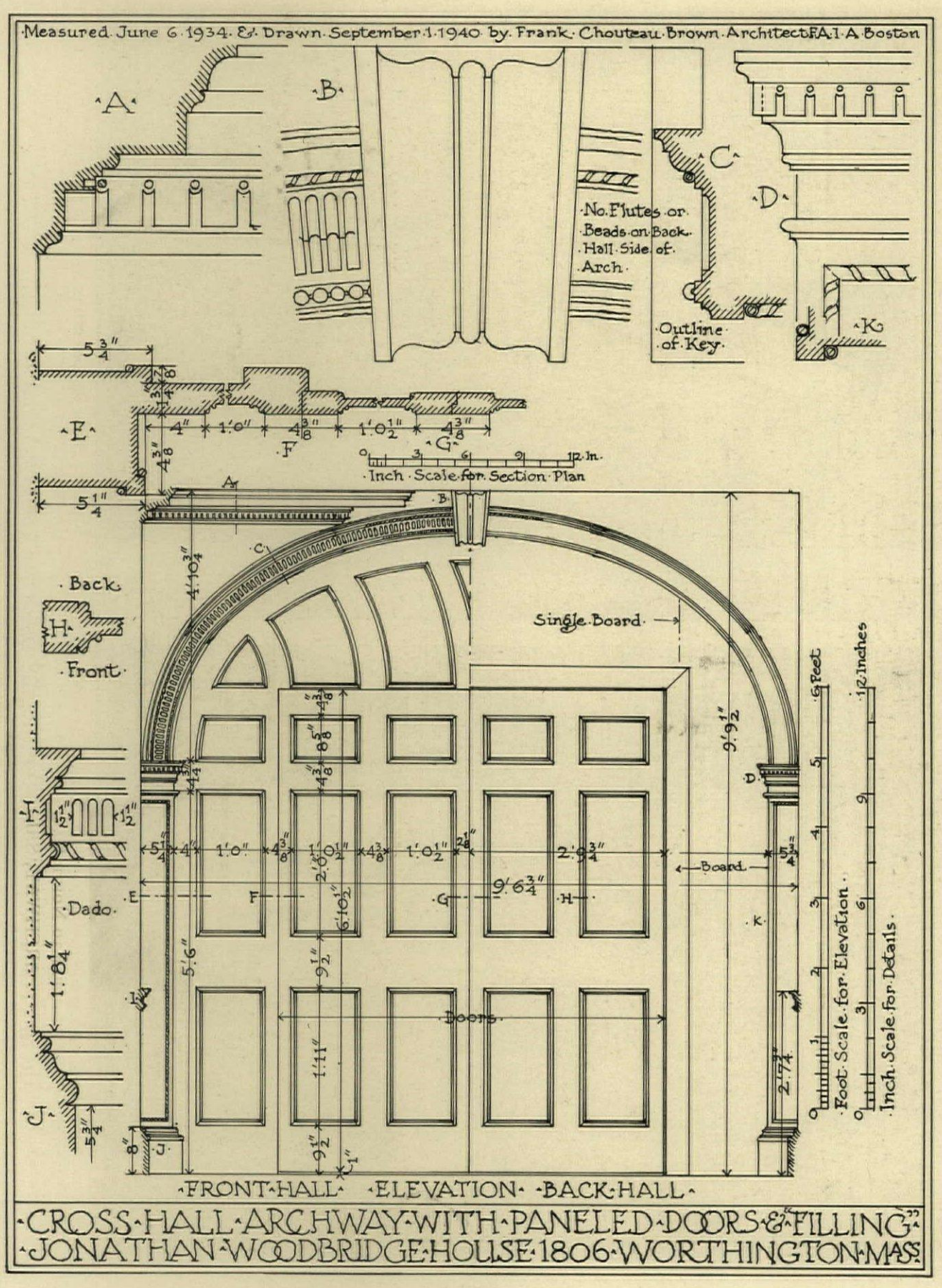


Courtesy Pennsylvania Museum of Art, Philadelphia

FURTHER ARCH RELOCATED IN McINTIRE ROOM, PHILADELPHIA MUSEUM

ARCHES FORMERLY IN EZEKIEL HERSEY DERBY HOUSE—1799—SALEM, MASSACHUSETTS

Samuel McIntire, Architect


Measured June 6 1934. & Drawn September 1 1940 by Frank Chouteau Brown Architect FA I A Boston
A
B
C
D
No. Flutes or Beads on Back Hall Side of Arch
Outline of Key
K
E
F
G
12 In.
Inch Scale for Section Plan
Back
H
Front
Single Board
Board
Dado
Doors
J
6 Feet
12 Inches
Foot Scale for Elevation
Inch Scale for Details
FRONT HALL ELEVATION BACK HALL
CROSS HALL ARCHWAY WITH PANELED DOORS & FILLING
JONATHAN WOODBRIDGE HOUSE 1806 WORTHINGTON MASS

[171]

Staircase Hall and Archway to North Garden Entrance

Courtesy Halliday Photograph Co.

Staircase Hall, seen through Archway from North Entry

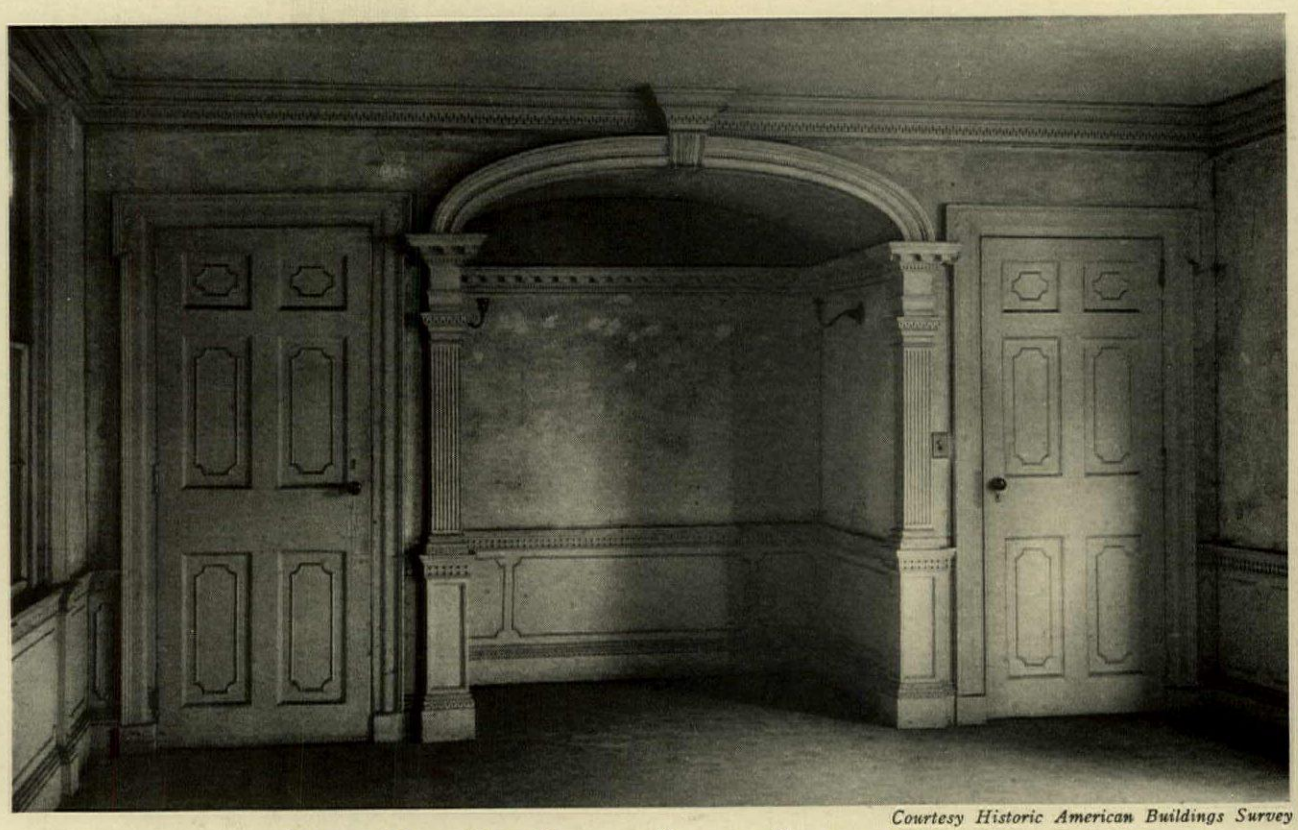
HALL UNDER STAIR ARCHWAY, SALTONSTALL HOUSE—1788—FORMERLY AT HAVERHILL, MASSACHUSETTS

Courtesy Essex Institute

DOORWAY WITH ELLIPTICAL ARCHED TOPLIGHT
HOUSE AT 92 WASHINGTON SQUARE, SALEM, MASS.

DOUBLE DOORWAY WITH SEMI-CIRCULAR TOPLIGHT
GEORGE READ, II, HOUSE—1799—NEW CASTLE, DELAWARE

DINING ROOM END TOWARD FIREPLACE WITH ARCHED SIDE ALCOVES



Courtesy Historic American Buildings Survey

DINING ROOM END, SHOWING CENTRAL SIDEBOARD ALCOVE

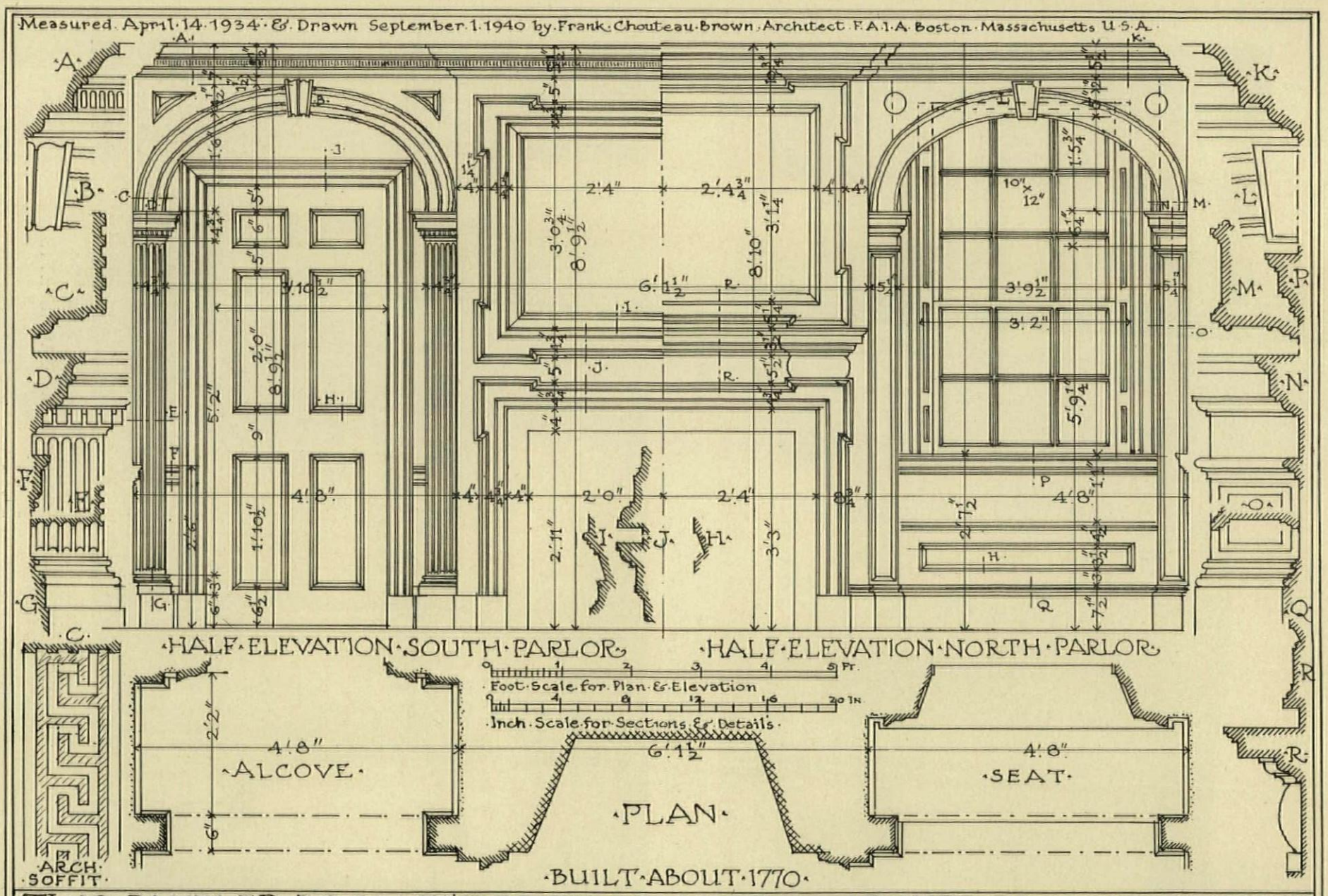
JERATHMAEL BOWERS HOUSE—1770—SOMERSET, MASSACHUSETTS

[174]

Dining Room End, with Paneled Arched Recesses
ROCK HALL—1767—LAWRENCE, LONG ISLAND, NEW YORK

Drawing Room End, with Arched Recesses to Front Parlor
"ELMWOOD"—1760—CAMBRIDGE, MASSACHUSETTS

[171]



TWO PANELED ROOM ENDS WITH ELLIPTICAL ARCHED RECESSED ALCOVES FORMERLY IN AN OLD DWELLING ON MAIN STREET CHARLESTOWN MASS

DRY BASEMENTS

BY RONALD ALLWORK

Damp basements bode no good—they hasten the corrosion of metals, they favor mildew, molds and decay, they feel cold and clammy, and they are decidedly unhealthy. They injure the reputation of both the architect who designs them and the builder who constructs them. A dry basement, on the other hand, makes for healthful living; it lengthens the life of the structure, equipment and furnishings, and it makes an otherwise unusable space suitable for work and recreation, laundry and storage.

Some basements are dry as a result of waterproofing; others come by it naturally—but many a damp basement would be dry if reasonable precautions and careful workmanship had been observed. It is much wiser to investigate all possible trouble sources and provide any necessary protection against moisture while construction is in progress, since waterproofing is not only costly if done after completion of the building, but it is sometimes impossible. Simple expedients, such as making adequate provision for the removal of roof water, or for the drainage of rain water adjacent to the building, may be the only requirement. It is obvious that the elimination of the cause at its source will obviate any need of providing for its consequences. That such a procedure is not always followed is admirably illustrated by the experience of the civil engineer who discovered water in his own basement. Full of the theories and practices involved, he delayed action as he pondered the best method of waterproofing. His wife, however, viewed it as a much simpler problem. Unknown to him she took matters into her own hand and had sod placed around the foundation to form a sharp embankment sloping away from the house, to divert the surface water (which she assumed to be causing the trouble) away from the basement wall. Subsequent rainfall proved her assumption correct and the basement remained dry.

CAUSES OF DAMP BASEMENTS

Dampness and the presence of water in the basement can always be eliminated by taking extreme measures, but because such measures are not always necessary it is advisable to investigate the possible sources of moisture first, in order to find the most effective (not the most expensive) method of protection. A study of the causes of damp basements finds the following most common.

Surface Water

Surface water usually originates in rains. It comes in contact with basement walls when the grade slopes down in the direction of the house, when the gutters overflow, or when the rains strike the walls of the building in an appreciable volume. This water seeps in the basement through porous areas in the walls or by entering in through cracks or junctions. Surface water exerts no pressure but finds its way into the basement as a result of gravity action.

Ground Water

Ground water, sometimes referred to as the Water Table, is more or less permanent. It seeks a certain level in the ground and exerts a hydrostatic pressure on the foundation when its level is above the basement floor.

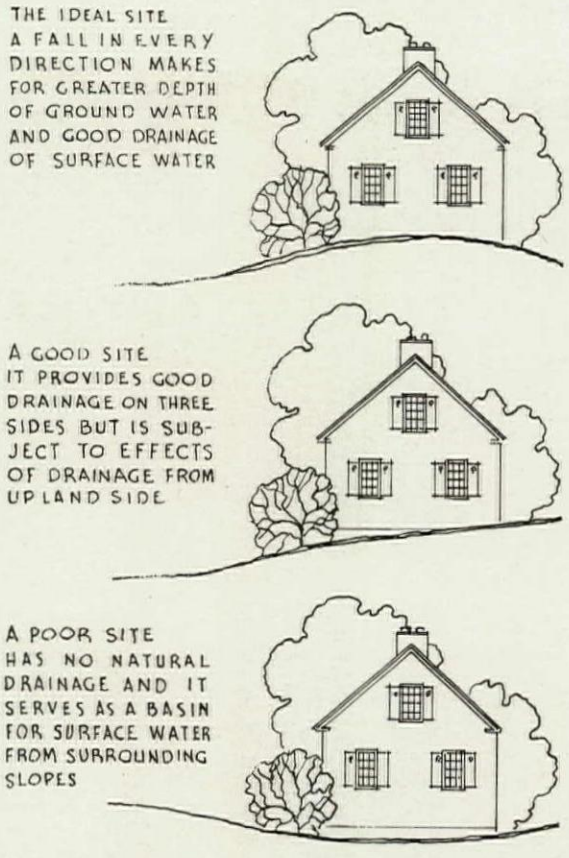


FIGURE 1—SELECTION OF SITE

In some instances, when the site is low and near the sea shore, this level may coincide with the rise and fall of the tide. Ground Water enters the basement in the same manner as surface water, except that it may be under pressure, and hence enter with greater speed and force than surface water. Dampness may also be due to capillary action, which often occurs when the ground water, although below the level of the basement floor, is near enough to be raised to the floor by such action.

Condensation

Dampness may also come as a result of condensation which takes place when warm moist air comes in contact with surfaces cooler than its dew point temperature. Such surfaces may be exposed cold water piping, drain pipes or even the basement walls. Unless removed, the condensate will accumulate.

Other Causes

Heavy shrubbery and vines adjacent to the building may bring about excessive dampness in a basement. Other causes such as faulty plumbing, backing up of sewers and leaking refrigerator drains must not be overlooked as possible trouble sources.

GENERAL CONSIDERATIONS

Two factors which have an important bearing on the successful design of a dry basement are the location of the house (topographically) and the nature of the soil.

The ideal site is one on the brow of a hill (see Figure 1.) which provides a fall or slope in every direction. Such a site offers a better movement of air, a greater depth to the ground water and good drainage of surface water. It is rarely advisable to select a site that is not moderately elevated with a fall in at least one direction. Level of the ground water in any case should be at least ten feet below grade but fifteen feet is preferable. Depth of the ground water may be determined by digging a test pit during the rainy season which will indicate the probable maximum conditions to be encountered.

The most desirable soil is that which is granular, hence open and porous. This type of soil, which includes sands, gravels and loams, readily admits air and water, and promotes the fast dispersement of water. In addition, granular soils compress but slightly, minimizing the settling of foundation walls and the development of cracks. Clay and similar soils may contain large percentages of water due to their fineness. In such instances, if an additional load is placed on a natural and undisturbed bed of clay it results in an expulsion of water until the clay has shrunk or settled to a point where it is again stable. Since this is a slow process which may continue for years, settlement of foundation walls, and their resultant cracking, cannot be assumed to have ceased after a stated period. Conversely, if a load is removed from a bed of clay, as occurs in excavating for a basement, the clay below the excavated area may swell, taking on more water and becoming less stable.

It will be found that the type of soil also has a direct bearing on the height to which water will rise by capillary action. In granular and porous soils this distance may not be more than two or three feet, but in silts

and clays the capillary rise may be as great as eight feet. It is therefore obvious that if moisture is to be kept out of the basement, the relation of the floor level to the ground water level depends on the type of soil encountered.

THE REMOVAL OF SURFACE WATER

Surface water may have its origin on the roof during a rain. Because of inadequate methods of draining it can ultimately affect the basement. Or it may be an accumulation of rain water on the surrounding ground surface which follows a slope toward the building. Provision for the removal of surface water should be made whether the basement is watertight or not.

Gutters and leaders are necessary for the proper removal of roof water, and they should be designed for maximum conditions, as set forth in the PENCIL POINTS *Data Sheets*. This is essential if water from overflowing gutters is to be prevented from finding its way down building walls and entering the basement.

If the leader is to be discharged at the grade adjacent to the building it is recommended that it empty onto a broad splash-block to assure the discharge of the water well away from the foundation wall. If the slope of the site permits, a better plan is to convey the water underground by means of draintile to a point where it may be discharged at grade on the side of a hill. If this is not feasible, it may be discharged into a dry well located at least fifteen feet away from the building. The draintile connection in either case must receive the leader well above grade, and the connection should be cemented. The ground adjacent to basement walls should always be graded to slope away from building. Where the slope of the site is pronounced some method of diverting the water on the up-grade side of the building is required. This might be accomplished by means of a gutter or broad embankment some distance up the slope and away from the house. A good plan is to provide the embankment with catch basins, drained by means of draintile. See Figure 2.

Drainage of foundation walls, as shown in Figure 3, is normally sufficient to take care of surface water. The draintile should be laid with open joints, the upper half being covered with tar paper tied on to prevent gravel from entering. Tile must be laid firm and true with a slight pitch in direction of flow. It should then be covered with broken stone or coarse gravel to within approximately two and a half feet of grade. On top of this a six-inch layer of fine gravel should be placed to receive top soil. Various authorities recommend the placing of straw, inverted sod, etc. on top of gravel before back filling in order to prevent the washing down of the loam. Such materials quickly decompose, however, and are therefore of little permanent value. The use of fine gravel serves the purpose and is more stable. Foundation drains may discharge to storm sewer, or dry well, or to grade if feasible.

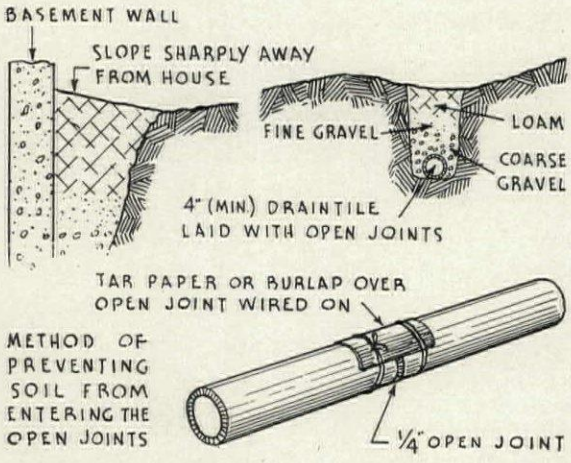


FIGURE 2—DRAINED TO CATCH BASIN

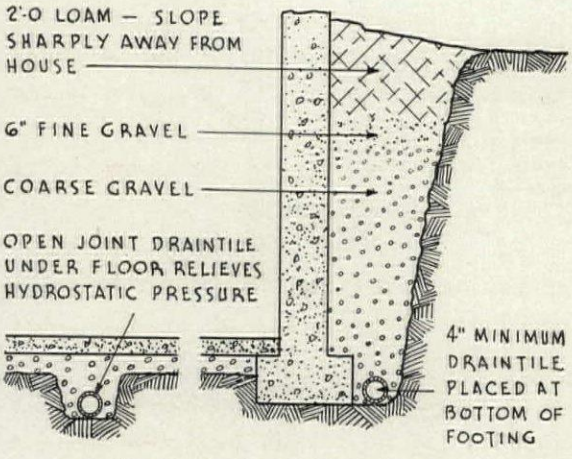


FIGURE 3—DRAINING SURFACE WATER

PROVIDING FOR GROUND WATER

When the basement floor is near the level of the ground water, moisture may enter through the floor by capillary action unless it is waterproofed or drained. If the ground water level should rise above the level of the basement floor, it will exert a hydrostatic pressure on the floor and walls that must be taken into account. For each foot above the level of the basement, the weight of approximately five inches of concrete floor is required to balance hydrostatic pressure. Walls must also be designed to withstand the lateral pressure, which amounts to about half of that exerted on the floor. Figure 3 shows how open joint draintiles are placed in the gravel under the basement floor to relieve hydrostatic pressure. In the case of a permanent high ground water level, the use of open drain tiles may be of no value since the existence of springs, underground rivers or nearness to tide water may provide a ground water source which can never be relieved—unless the entire ocean be pumped out from under the floor of the building. Where the hydrostatic pressure from ground water is intermittent, the use of draintile will only relieve the difficulty when the water can be led to some means of disposal such as a city sewer. An example of a case where intermittent ground water might be troublesome would be a cup-shaped formation which collected water as a result of rainfall. Such a cup-shaped formation might be filled with earth so that its presence would not be known from an examination of the topography. An excavation for a building occurring in terrain of this type would give trouble after every rain and it would be necessary to relieve this pressure in order to have a dry basement. Methods of water proofing basements when ground water is present are discussed in later paragraphs.

PREVENTING CONDENSATION

Condensation of atmospheric moisture in a basement may become a serious problem, particularly if there is but little ventilation and the basement is deep. Deep basements are usually cooler, and cold surfaces bring

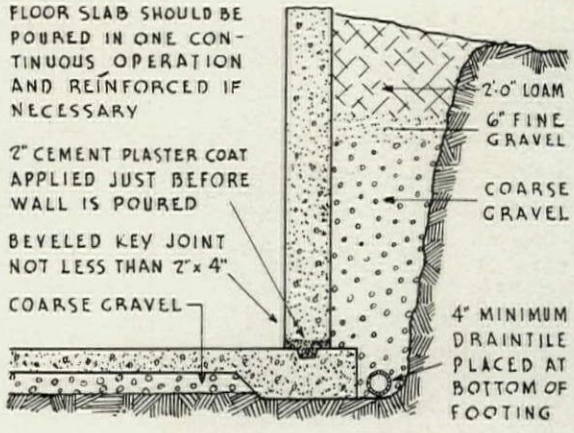


FIGURE 4—A TYPE OF CONSTRUCTION TYPICAL OF SWIMMING POOLS WHICH IS ALSO APPLICABLE TO BASEMENT DESIGN IF BUILT WITH THE SAME CARE

about condensation when contacted by warm moist air.

Good ventilation is probably the only practical remedy for condensation. All basements should have at least one square foot of window area for each 300 to 400 cubic feet. Cross ventilation, sunlight and the unrestricted movement of air will bring about the elimination of condensation in most cases. One expedient is the insulation (with vapor seal) of the basement walls on furring to provide air spaces between foundation walls and finished interior surfaces.

CONCRETE CONSTRUCTION

Monolithic concrete, when made of good materials carefully mixed, properly placed and fully cured, is inherently watertight. That this is often far from being the fact in actual construction is due, in large part, to one or more of the reasons discussed below:

1. Inadequacy of the footings or the unstable character of the soil bringing about an undue or uneven settlement of foundation walls which results in cracks or the opening of joints.

2. Defective or imperfect materials which fail to effect a proper homogeneous and monolithic structure. This may be the fault of the cement, but it is more often due to unclean sand or poorly graded aggregates.

3. Poor workmanship, as evidenced by the improper porportioning of the materials and the lack of their thorough mixing. Or by ex-

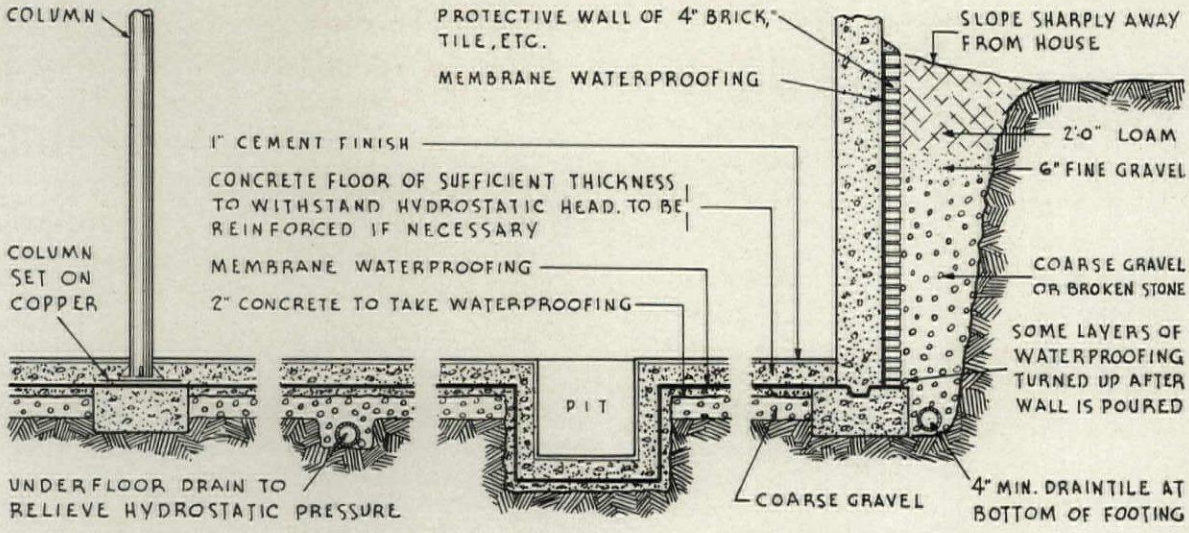


FIGURE 5—MEMBRANE WATERPROOFING PLACED ON THE WATERSIDE PROVIDES CONTINUOUS PROTECTION

cessive handling, careless placing, and insufficient spading or tamping.

4. The use of excessive water, resulting in laitance, which is the accumulation of the finer materials of the cement and aggregate on top of the concrete mass. Laitance results in a layer of concrete of very little strength that disintegrates rapidly when exposed to the weather or penetrated by water. Excessive water in a mixture will also bring about shrinkage and cause cracks.

5. Neglecting to provide for expansion and contraction which causes cracking and the opening of joints.

Figure 4 shows a type of construction typical of swimming pools which is applicable to basement design. This essentially monolithic structure will be found watertight if all the precautions of good construction are followed. The concrete is mixed in proportion of one part cement, two parts sand and four parts broken stone or gravel. Only sufficient water is used to allow the material to be thoroughly mixed and properly handled.

The footings and basement floor are integral and should be poured in one continuous operation. Prior to pouring the floor slab, the forms for the outside of the basement walls are placed in position to assure the speedy progress of the work once the floor has set. A key joint not less than four inches wide and two inches deep is provided.

Before pouring the concrete in the walls, a plaster coat of cement mixed in proportion of one part cement and two parts sand is applied to this key joint for a thickness of 2" as illustrated in Figure 4. This is most important if a watertight basement is to be achieved. The concrete mix for the walls is then deposited in the forms in horizontal layers not exceeding eight inches in depth with each layer being kept at a constant level throughout the length of the walls. The concrete should be placed as nearly in its final position as possible to avoid rehandling. Constant spading, at the rate of one man spading to each two wheelbarrows delivering is recommended. In curing, the exposed surfaces of the concrete are kept wet for seven days.

When the type of basement construction described above cannot be undertaken because of the unreliability of the workmanship, time element or other factors—or because the use of other materials such as stone, brick, cinder or concrete block is preferred—waterproofing may be required.

Integral Waterproofing incorporates compounds, liquids, powders or pastes in the concrete at the time of mixing. These materials accomplish water tightness by filling the voids in the concrete, by repelling water or by increasing the chemical activity of the cement to make it impervious to moisture.

Membrane waterproofing, applied to the waterside of walls and floors, provides a continuous membrane which seals the entire basement. (See Figure 5.) The membrane

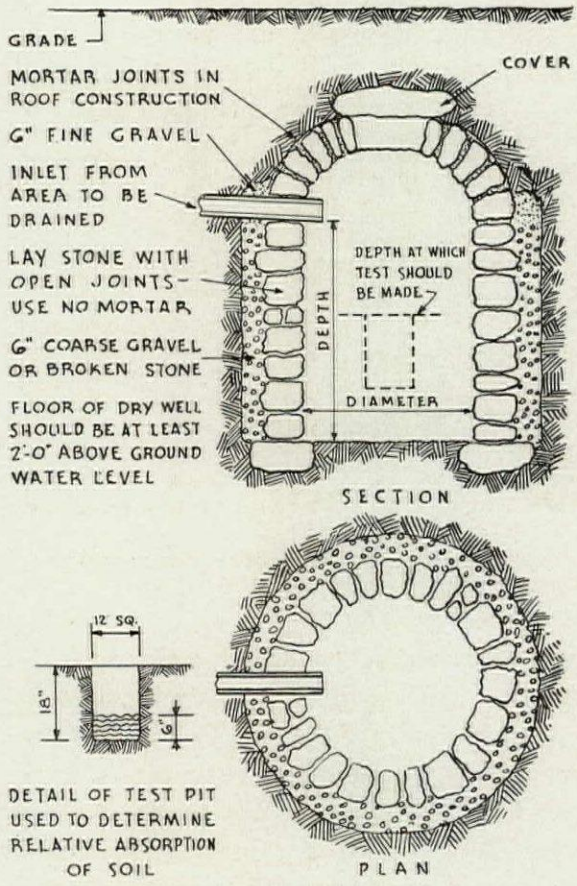


FIGURE 6—DRY WELL CONSTRUCTION

consists of layers of impregnated felt or similar material covered with pitch or asphalt applied hot.

Surface Coating is the application of a dampproof cement plaster to the interior (or exterior) surfaces of the basement. (Figure 6.) The walls and floor to be treated must be rough and it is important that they be carefully prepared to receive the plaster by thorough cleaning and moistening. Wetting should be done with clean water several hours before the application of the plaster.

DRY WELLS

The dry well is so often regarded as a stepchild of the sewage disposal system that it rarely receives the attention it deserves. While the various governmental departments of health exercise rigid control over waste disposal, they are concerned with the removal of storm and sub-soil water only when it affects the sewage system. It is natural that the study of sewage disposal should be of first importance, but it is unfortunate also that very few data are available on dry well construction.

Dry well design should follow closely the best practices observed in the construction of leaching cesspools as shown in Figure 6. Though a dry well built of stone is illustrated, other materials commonly used include brick and concrete blocks. In all cases the material should be laid with open joints. When brick is used, every sixth course must be laid in mortar. If concrete blocks are used the 8 inch size is recommended. Also available is a 4 inch radial type concrete block with holes which is designed especially for cesspools.

A dry well is usually smaller than the average cesspool, and because there is no necessity for its periodical cleaning, the opening in the roof may be omitted. The beehive construction shown in the drawing requires the use of mortar in the roof only, which may be entirely closed over, or have a small opening as illustrated.

The proper sizing of a dry well is an important consideration if a dry basement is to be assured. Approached from the engineering angle the problem of providing for the drainage of a particular area is not reduced to formula but requires a consideration of two variables. These are (1) the maximum expected rainfall intensity and frequency for the locality and (2) the porosity of the soil on the site. The first may be determined by a study of bulletins on the subject published by the U. S. Department of Agriculture, and the second is usually established by means of soil tests similar to those employed in sewage disposal work. This involves the digging of a test pit of standard dimensions and measuring the rate at which a quantity of water, poured into the pit, disappears.

From this it is evident that the process of sizing a dry well is far from simple. Furthermore, though this method may provide a dry well of almost unquestioned adequacy, for the greater part of the time its capacity will be in excess of normal requirements. For this reason many engineers and contractors size dry wells by rules of thumb which experience has proved sufficient. These rules

do not provide for maximum conditions, but if they did it would not be justified due to the expense involved. If the possibility of the dry well overflowing once in several years can be tolerated, for example, its size may be appreciably reduced from that which would be required to meet maximum expected conditions. These several methods of estimating dry well capacities vary with the locale, and because they are based on local findings, they would offer little aid if discussed here. The following formula, with many reservations, might serve.

$$\frac{\text{Roof Area Sq. Ft.} \times \text{Rainfall Intensity Inches} \times \text{"S"}}{12} = \text{Dry well Capacity In Cubic Feet}$$

The Rainfall Intensity may be obtained from Figure 7. This map indicates the maximum five-minute rainfall, in inches, to be expected once in twenty-five years. In sizing a dry well on this basis, quantities resulting from a longer rainfall period are not provided for, except that, depending on the porosity of the soil, a certain quantity of water will leach from the dry well and hence allow a greater quantity to be handled. It is therefore essential that the porosity of the soil be considered. This is provided for in the formula by the factor "S" which may be considered as follows.

"S"	Character of Soil
1	Coarse sand or gravel
1.3	Sandy loam
use of dry well questioned	Soils containing clay

Soils which contain clay in appreciable amounts provide for so little absorption that the advisability of using a dry well is questionable. If used in this type of soil, a frequent overflowing of the dry well is to be expected unless its size is made so great as to be hardly justified.

When the dry well capacity in cubic feet has been determined refer to table of Dry Well Sizes, Figure 8, and select the next greatest size shown. Sizes not shown on the table may also be used if of sufficient capacity, but it will be found that those given are generally sufficient to meet the average requirements. It must be remembered that the

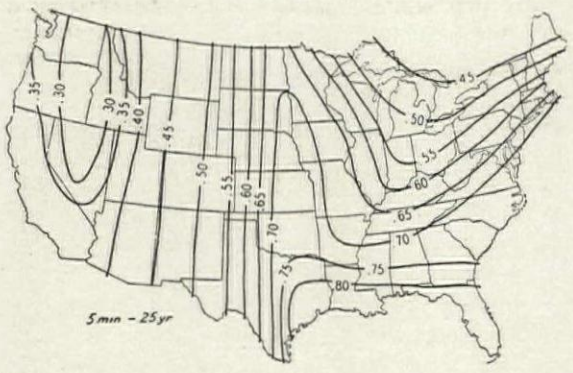


FIGURE 7—RAINFALL INTENSITY

DRY WELL CAPACITY	DRY WELL DIMENSIONS	
	DIAMETER	HEIGHT
CUBIC FEET	FEET—INCHES	FEET—INCHES
9.4	2 - 0	3 - 0
14.7	2 - 6	3 - 0
21.0	3 - 0	3 - 0
28.2	3 - 0	4 - 0
33.6	3 - 6	3 - 6
38.4	3 - 6	4 - 0
43.2	3 - 6	4 - 6
50.0	4 - 0	4 - 0
56.5	4 - 0	4 - 6
63.0	4 - 0	5 - 0
71.5	4 - 6	4 - 6
79.5	4 - 6	5 - 0
87.5	4 - 6	5 - 6
98.0	5 - 0	5 - 0
108.0	5 - 0	5 - 6
130.0	5 - 6	5 - 6
170.0	6 - 0	6 - 0

FIGURE 8—TABLE OF DRY WELL SIZES

level of the ground water (if present) should be at least two feet below the bottom of the dry well, hence the depth of many dry wells will be established by this condition. A depth greater than six feet is rarely necessary and may prove to be unduly expensive. It is recommended that for practical reasons the size of the dry well be kept fairly small with two or more being used in preference to one large one.

METHODS OF DRAINING

The removal of surface water that accumulates in footing drains or the water carried by roof leaders is provided for in one of several ways. If the site of the house is in an urban community, a storm sewer is usually available and used for this purpose. If the house is in the country, the discharge should be made to grade, if feasible, or to a

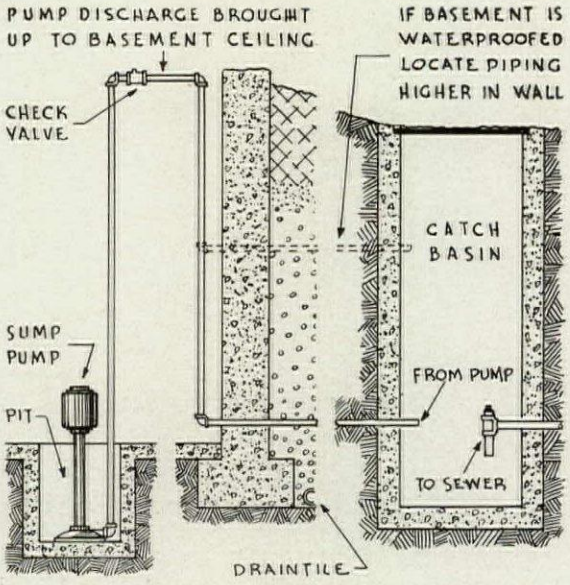


FIGURE 9—DRAINING BY SUMP PUMP

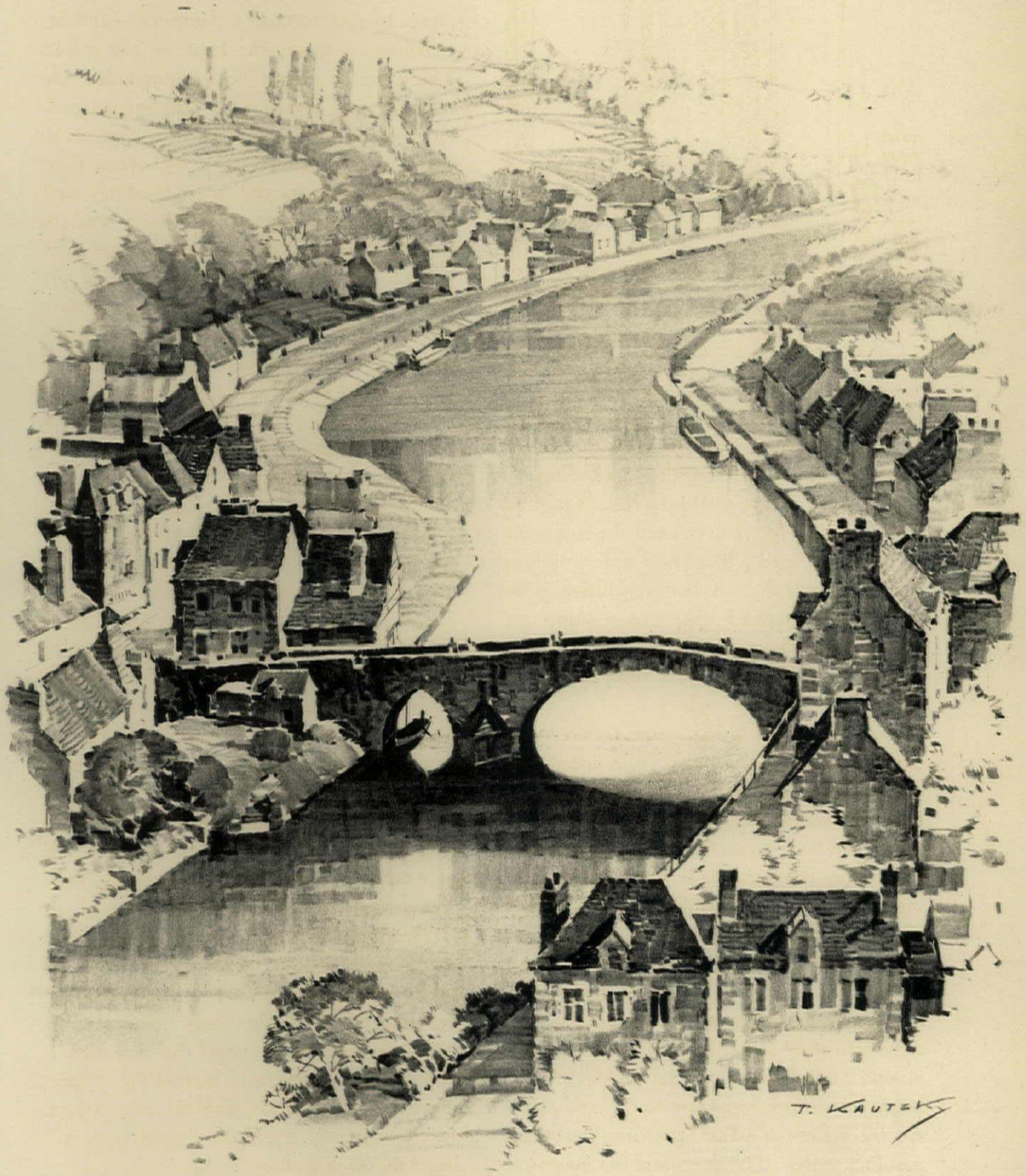
dry well. Ground water close to the level of the basement floor presents a more difficult problem. Drain tile discharges to sewer, grade or dry well may relieve hydrostatic pressure but if dryness in the basement is to be achieved, faultless waterproofing must be the rule. A better solution is to conduct the ground water to a sump pit (with under floor drain tile) where it can be removed by means of a sump pump or drainer.

It is perhaps natural that some architectural designers should shy away from specifying motor-driven mechanical equipment not absolutely essential to the requirements of the house, but such a reaction is unfortunately a carry-over from the days when such equipment was less dependable and power failures were more frequent. Now, in a generation in which the oil burner, the stoker and the electric refrigerator are so widely accepted, these sump pumps have undoubtedly come into their own. Several types of sump pumps and drainers are available on the market at surprisingly low cost. Some operate by water or steam pressure, some by gasoline motor. Most common, however, are those powered by electric motors and which operate automatically by means of an electric switch or other device that starts the pump when the water level rises.

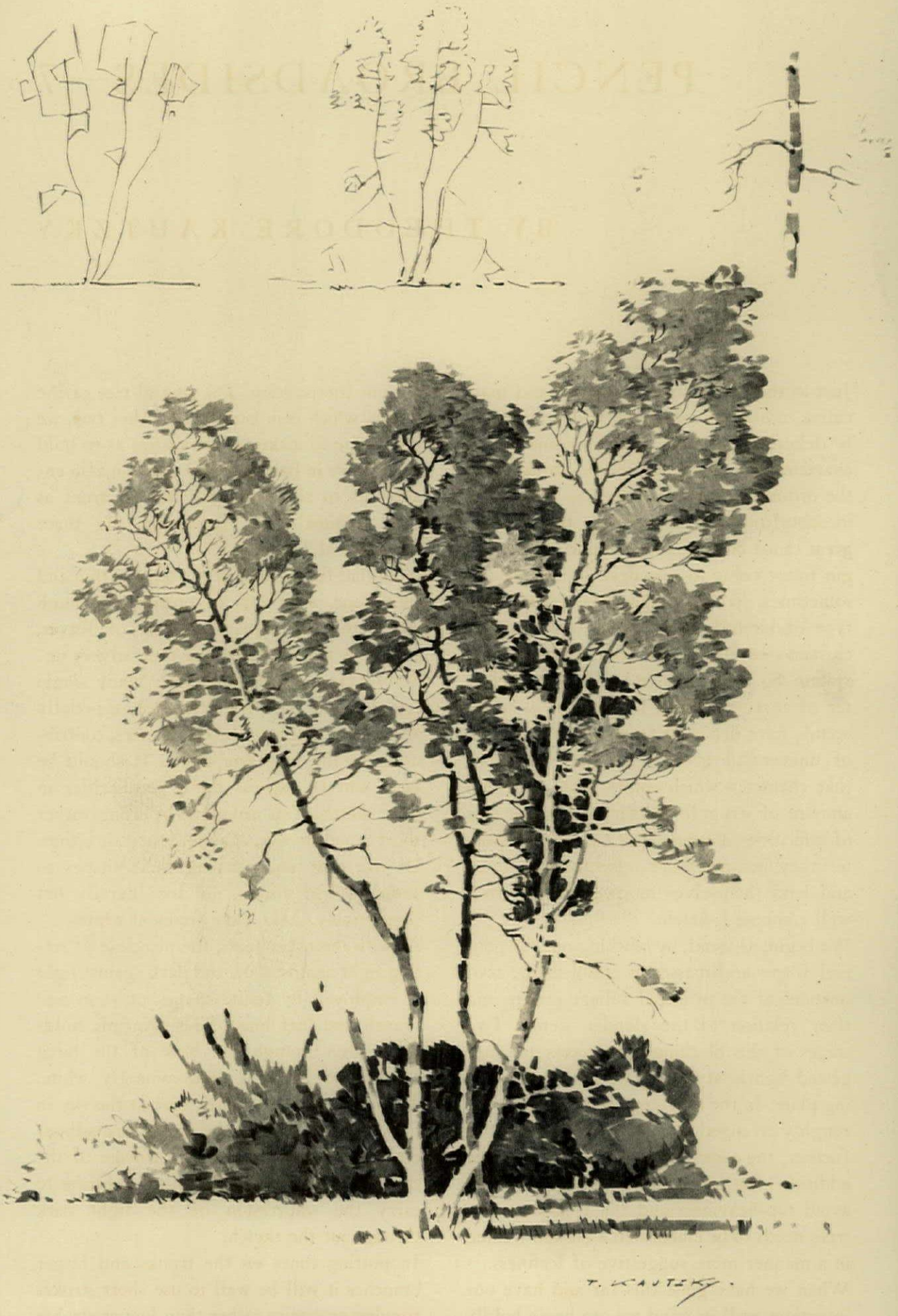
Very often basements are designed with no provision for the removal of accumulated water. During unusual storms many watertight basements will admit water through bulkheads or windows, or water might come as a result of draining the boiler or other cause. In such instances, dampness—and inconvenience, to say the least—is the result. Therefore it cannot be recommended too strongly that a means of draining be provided even if the indications are such as to make it seem unnecessary. Where a floor drain can be discharged to grade or dry well the problem is simple. If discharged to sewer, a trapped drain is sometimes employed, but when used, the chance that the water in the trap may evaporate (because of infrequent use) and admit foul air, or the possibility that the sewer might back up into the basement, must be recognized. Figure 9 illustrates a method of preventing back water from sewer entering basement. The sump pump discharge is carried to the basement ceiling and thence through the foundation wall to a catch basin. Note that the discharge is passed through the foundation wall at a high point if the basement is waterproofed. This is to avoid the possibility of this pipe sleeve becoming a point at which ground or surface water could find its way into the basement.

Should the installation of a drain be impractical, and the providing of a sump pump omitted, a sump pit, at least, should be provided. It costs but little when construction is in progress and it may save a great deal of trouble in some future emergency, since it is a requirement for all sump pumps. It is recommended that the pit be approximately twenty-four inches in diameter and twenty-four inches deep with the floor sloping toward it in all directions. This pit may be also placed in an out-of-the-way corner, in which case a centrally located floor drain, connected under floor with the pit, is used. In this instance the floor should slope toward the floor drain.

Providing for the draining of the basement (whether waterproofed or not) is a "must" of good design. The small additional cost involved will be repaid many times over in the convenience realized in the draining of boilers, washing machines, and floors.



VIEW OF DINAN, BRITTANY



LESSON 7 — STRUCTURE AND FOLIAGE OF BIRCH TREES

PENCIL BROADSIDES—7

BY THEODORE KAUTZKY

Just as the oak is strong, rugged, and masculine, the birch, which we will now study, is delicate, graceful, and feminine in its characteristics. I am, of course, thinking of the ordinary white birch seen so frequently in suburban landscapes rather than of the great canoe birch which is found in the virgin forest rising to considerable heights and sometimes having impressive girth. The type of birch I mean grows commonly in clusters—several stems from a single root system. So I have chosen to illustrate a cluster of three in which the trunks, as often occurs, have departed from the straight line of uneventful growth and have acquired that character which comes from a certain amount of struggle for survival in the face of difficulties. Because they have this character they become more interesting to draw and lend themselves more effectively to a well-composed sketch.

We begin, as usual, by blocking out the general forms and masses to establish the proportions of the principal foliage groups and their relation to the slender stems. Two stages of this blocking out process are suggested lightly at the top of the accompanying plate. In the first step the trees alone are roughly arranged in a group. Carried a little further, the composition is seen to need the addition of a mass of shrubbery behind it to avoid top-heaviness and the foliage of the trees needs to be elaborated a bit and treated in a manner more suggestive of leafiness.

When we have gone this far and have our intentions well in mind we can begin boldly to lay in the values we have decided upon for our composition. The central tree of the group, which is in back of the other two, we determine to make the darkest so as to hold the picture in balance. This decision also enables us to silhouette the tree in front as light against dark, increasing the three dimensional feeling.

Note that the foliage of the birch is thin and tremulous, with lots of openings through which the sky shines and lots of leaves, stirred by the wind, turning their silvery under surfaces to the observer. Many single leaves stand out from the rest, especially around the edges of foliage masses, contributing to the sparkling effect. It should be your aim to express these peculiarities in your sketch. You can do it by using rather short broad strokes, changing their directions all the time and varying their shapes to simulate leaf forms, not too literally but suggestively. Also leave frequent whites.

As with the other trees, the principle of setting light against dark and dark against light is employed to define shapes of stem and branch and leaf mass. This principle holds good even though the bark of the birch trunks and limbs is predominantly white. They will still seem dark against the sky in many places. Where the trunks are silhouetted white against the dark foliage of the shrubbery there will be enough lightness to carry the impression of the light bark throughout the sketch.

In putting tones on the trunks and larger branches it will be well to use short strokes running crosswise rather than longer strokes running lengthwise. Somehow this treatment

expresses better the quality of the bark, which has a horizontal grain as is known to every one who has peeled a birch tree. Occasional breaks in the continuity of the shading, leaving white gaps not too long for the eye to carry past, are also in character with this tree. The little section in the upper right-hand corner of the plate will show what I mean.

Be sure to keep the trunks properly slender and tapering delicately all the way to the top. The branches usually tend to curve up from the main stem, particularly near the top of the tree where they are shorter. Lower down they may tend to be more horizontal or to bend down if they have had to carry heavy foliage during the tree's life. Ice storms often permanently change their curvature.

I cannot emphasize too much the importance of the silhouette of foliage masses in conveying the character of a tree. Whether you are conscious of it or not as you look at a specimen you are getting an important part of your impression from the way the edges are broken up against the sky or against other trees or buildings. Try therefore to discern as well as you can what the identifying marks are and give particular care to putting them down in your sketch. This effort will repay you.

Next lesson will deal with another common tree, the elm. While you are waiting for it spend plenty of time mastering the birch, for it's not as easy as it looks. Incidentally, I'm wondering what progress some of you are making. Why not send in some of your sketches for criticism. I'll be able to check up then on whether you are sharpening your pencils often and using them skilfully.

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Ernest R. G. Trimbath, 115 1-2 Hickory Street, Johnstown, Pa., would like to obtain a copy of *Harvard City Planning Studies*, Vol. III (Neighborhoods of Small Houses), 205 pages. Please state condition of book and price.

Mrs. Frid. Heer, 2535 Traut Terrace, Dubuque, Iowa, has the following architectural magazines for sale: *American Architect, Architectural Forum, The Brickbuilder*, PENCIL POINTS, *Building Age, Modern Hospital, Through the Ages, The Nation's Schools, The Western Architect, Architecture and Building, Technology Architectural Record, Falles American Architecture.*

George F. Sansbury, Cumberland, Maryland, has the following copies of *Architectural Record* for sale: October, 1915; October, 1916; October, 1917; October, 1918; October, 1919; January, February, April, May, July through December, 1920; all of 1921 except June, September; January, March through October, 1922; September through December, 1923; January through October, except February, 1924; January through April, June, July, November, December, 1928; 1929 complete; January, February, March, 1930. Will consider offer for all or part.

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(Continued on page 42, Advertising Section)

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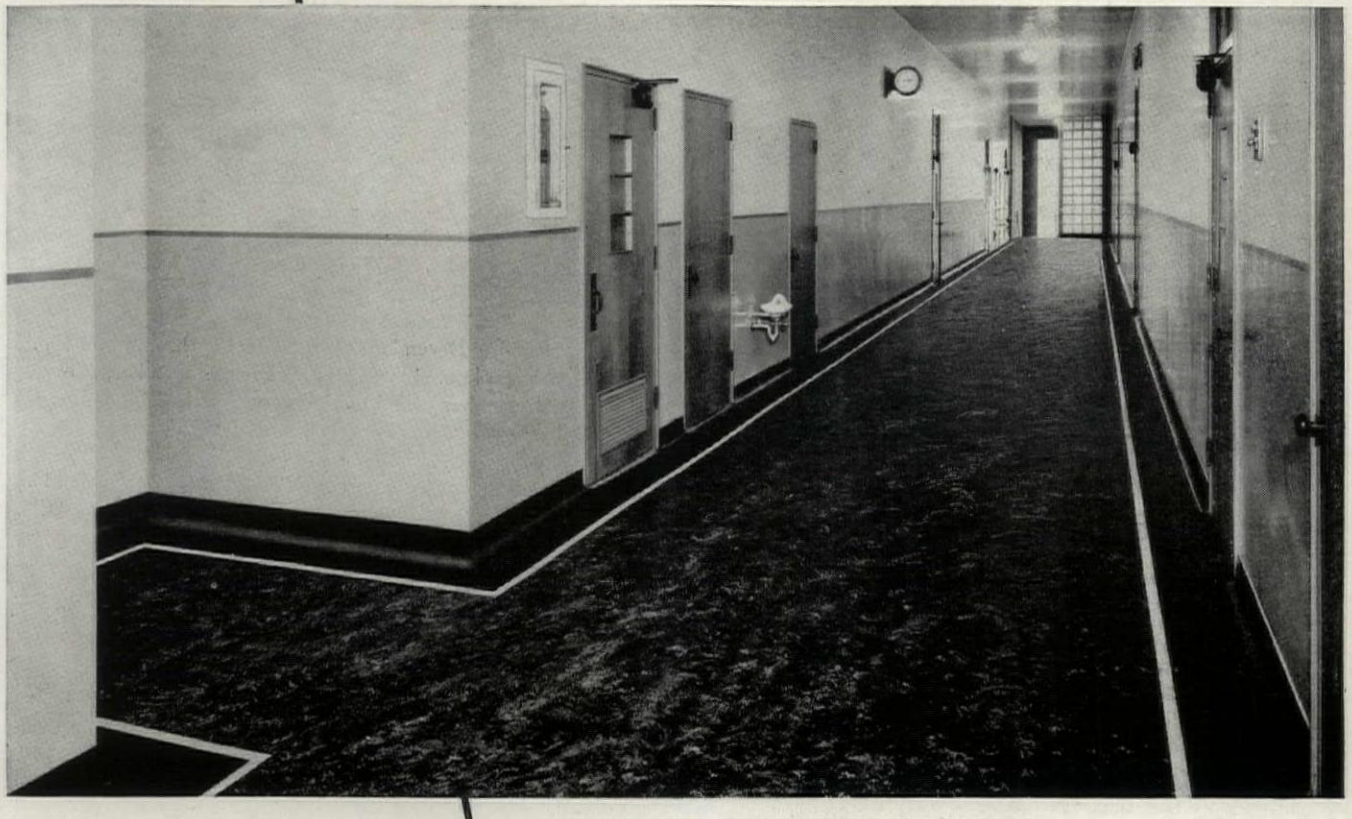

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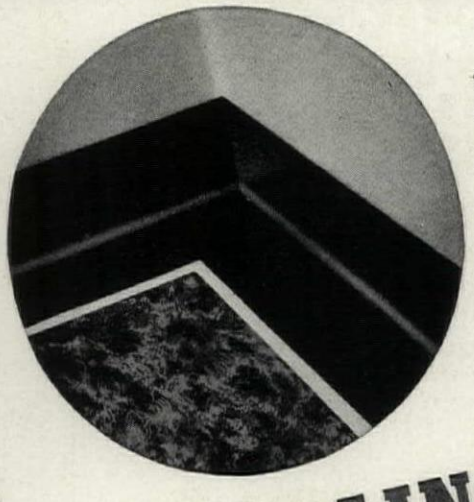

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H. J. Fowler, 59 Adams Street, Mt. Vernon, N. Y., has for sale some very fine K&E engineering instruments, in cases, good condition: No. 1753 Parallel Rule; 18" Triangular Scale Rule; No. 2174 18" Curve Rule; No. 1160 Both's Parent Scale Liner; No. 1887 15" T-Square; No. 1622-P 12" Paragon Scale; No. 1166-C Sectional Liner; a very large Beam Compass with adjustable points. Also other engineering instruments and many technical books.

Arthur G. Cromwell, 440 Plymouth Avenue S., Rochester, N. Y., has the following magazines for sale: PENCIL POINTS—December, 1922; 1923, 1924, 1925, complete; November and December, 1935; 1936, complete; all except February, 1937; 1938, 1939, complete. *Architectural Record*—August, 1923; August, October, November, December, 1932; 1933 through 1940 to date, complete. *Architectural Forum*—October, November, December, 1935; all except April, 1936; January and February, 1937; 1938 complete; January, February, March, 1939. *Architecture*—1922 bound in cloth in 2 volumes; 1923 same; 1924, 1925, 1926; January through September, 1927; April, May, June, 1933. All are in excellent condition, will sell separately only on large order, purchaser to pay freight.

Randall S. Naden, 630 Maple Street, Fall River, Mass., has the following magazines for sale, all in excellent condition: PENCIL POINTS—November and December, 1935; 1936, 1937, 1938, 1939, complete. *American Architect*—May through December, 1935; all except May and October, 1936; 1937 and 1938 complete. *Architectural Record*—January through October, 1939. Please make offer.

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C. McKINLEY OLSON and OLIVER SANDQUIST, *Architects*, have formed a partnership for the general practice of architecture, with offices at Century Court, 161 East Erie Street, Chicago, Ill.

WINSTON ELTING, THEODORE LAMB and PAUL SCHWEIKHER have opened new offices at 152 East Ontario Street, Chicago, Ill., for the practice of architecture and industrial design.

BUCKLEY, ARANGO & LYONS, *Architects and Engineers*, have opened an office at 930-931 Barr Building, Washington, D. C., with Rolland C. Buckley, Architect, in charge. Mr. Buckley was formerly with the Central Office of the PWA. The firm will still maintain their offices in Panama and Colon, Republic de Panama.

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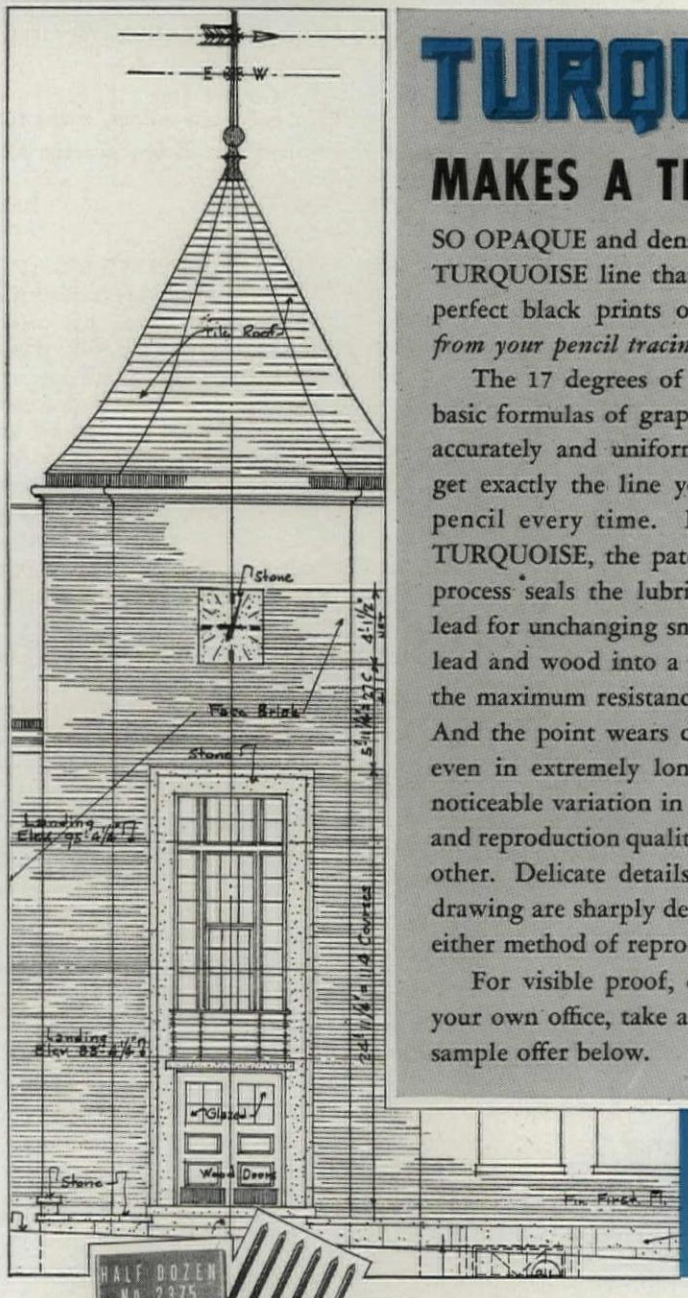

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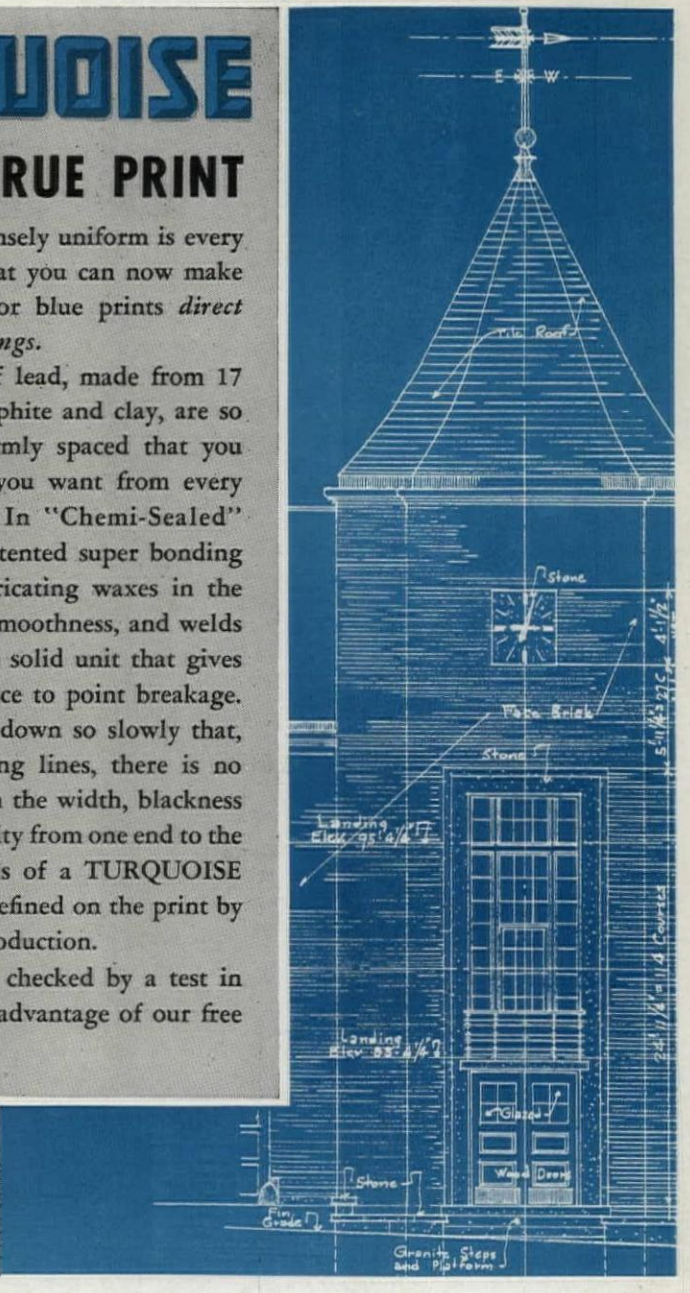

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PUBLICATIONS ON MATERIALS AND EQUIPMENT

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COVERT FIREPLACES.—A.I.A. File No. 14-e-22. Catalog No. 12 describes the Covert line of fireplace units, fireplace dampers, steel smoke chambers and fireplace accessories. Construction details and suggestions. 22 pp. The H. W. Covert Co., 339 E. 48th St., New York, N. Y.

LOW COST GENERAL ELECTRIC CONDENSING UNITS. — A.I.A. File No. 30-f. New publication describes condensing units from 5 to 60 hp for both refrigeration and air conditioning installations. Prepared especially for engineers, architects and contractors, the booklet is largely devoted to performance and application data, compressor accessories, instructions for capacity modulation, multiple unit operation, and other engineering information needed in the design of large-scale refrigeration and air conditioning systems. 58 pp. 8½ x 11. General Electric Co., Air Conditioning and Commercial Refrigeration Dept., Bloomfield, N. J.

HARDWARE OF DISTINCTIVE CHARM AND COLOR BY LOCKWOOD.—Folder printed in full colors showing a variety of designs of exterior and interior residence doors. 4 pp. 8½ x 11. Lockwood Hardware Mfg. Co., Div. of Independent Lock Co., Fitchburg, Mass.

A GLIMPSE OF AN INTERESTING MODERN HOME. — Folder, dealing with the subject of hard maple, illustrates the use of this wood for the various floors in a well-designed modern home. Several grades of the wood are shown in colors. Included are directions for laying and finishing maple floors. 8 pp. 8½ x 11. Maple Flooring Mfrs. Assn., 1785 McCormick Bldg., Chicago, Ill.

POR-CE-LOK.—Bulletin covering an interlocking design of corrugated roofing and siding sheet, coated on all surfaces with special porcelain enamels for use on chemical, processing and water-front buildings, steel mills, etc. 4 pp. 8½ x 11. Porcelain Steels, Inc., Cedar and Ashland Road, Cleveland, O.

SOFTONE ACOUSTICAL TILE AND PLASTER.—A.I.A. File No. 39-b. Folder describing the principal features of a new kind of acoustical tile and plaster for use in hotels, hospitals, offices, restaurants, auditoriums and public buildings. 4 pp. 8½ x 11. Industrials, Inc., 1530 Chestnut St., Philadelphia, Pa.

(Continued on page 48)

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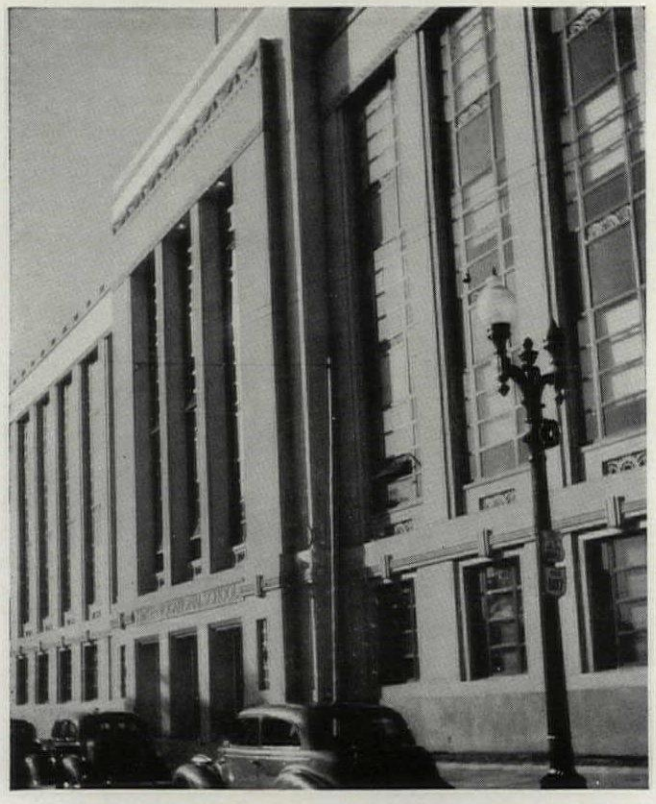

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PUBLICATIONS ON MATERIALS AND EQUIPMENT

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PAINT PROGRESS. — A.I.A. File No. 25. Issue No. 4 of a series of monthly publications includes articles describing the painting of the Parkchester housing projects; how to paint asbestos shingles; painting of porous surfaces; precautions to take when painting acoustical wall board; zinc dust primers for structural steel and painting damp water pipes. 12 pp. 8½ x 11. The New Jersey Zinc Co., 160 Front St., New York, N. Y.

NEW CHROMEDGE METAL TRIMS.—Supplement to 1940 catalog presents more than 90 designs and types of new metal trims, including wainscot cap trims, corner and cove trims, linoleum insert trims, nosings, etc. 8 pp. 8½ x 11. The B & T Floor Co., Columbus, Ohio.

MORE ROOF VALUE FOR YOUR MONEY.—Booklet giving detailed description of how Asqu, a new roofing, was developed. 20 pp. The Philip Carey Co., Lockland, Ohio.

HOW LUMBER AND PAINT KEEP YOUR HOME ALWAYS IN STYLE.—Folder, dealing with the subject of modern paint styling, shows how the use of wood construction and good paint allow the maximum decoration and serviceability to be attained in modern construction at lowest cost. Included are complete exterior color-styling suggestions for two homes sponsored by the National Small Homes Demonstration. 4 pp. 8½ x 11. Lead Industries Assn., 420 Lexington Ave., New York, N. Y.

COLD CATHODE FLUORESCENT ILLUMINATION. — Bulletin No. 7-40 for architects and lighting engineers explains in detail the principle and advantages of the cold cathode method of fluorescent illumination for commercial, industrial, and home lighting. Complete information is given how to figure illumination needs in terms of fluorescent lighting; recommended foot candles for every type of installation; graphs and charts showing foot candles readings at various distances from the fluorescent lamps; data on National double circuit voltage amplifiers, sockets, housings, and fluorescent lamps used in the installations and other general information on cold cathode fluorescent lighting units. 24 pp. 8½ x 11. National Transformer Corp., 224-232 Twenty-first Ave., Paterson, N. J.

MODERN MOULDINGS IN ALUMINUM.—A.I.A. File No. 15, Issue No. 40. Many new architectural and decorative mouldings in aluminum and a widely increased range of flats, squares, angles, channels, etc., have been added in this new issue. Three pages are devoted to interesting and timely details. 20 pp. 8½ x 11. J. G. Braun Co., 537 W. 35th St., New York, N. Y.

FLUORESCENT LIGHTING. — Booklet A-3618. A practical guide to the application of Mazda F lamps and equipment, explains how the lamps work and the whys and wherefores of auxiliaries. Answers are given for the many questions asked about d-c operation, temperature effect in outdoor operation, color, stroboscopic effect, radio interference, and lighting costs. Illustrations of installations, wiring diagrams, and tables of essential technical data are included. Current-limiting devices, starters, lampholders, and other auxiliary apparatus are discussed in detail. 24 pp. Westinghouse Elec. Mfg. Co., Dept. 8N48, East Pittsburgh, Pa.

DRAFTO PORTABLE DRAWING MACHINES. — Bulletin describing and illustrating a line of portable drawing machines. Specifications, price list, etc. The Drafto Co., Cochranton, Pa.

KNO-DRAFT AIR DISTRIBUTION DEVICES.—Looseleaf catalog presenting complete descriptive and technical data on the Kno-Draft line of ceiling type air distributing devices. Suggested specifications. 32 pp. 8½ x 11. Plandaire, Inc., P. O. Box 730, Oakland Station, Pittsburgh, Pa.

MOZART FLUORESCENT LIGHTING.—Folder describing a new line of artistic fluorescent lighting fixtures for use in homes, offices and sales rooms. 8½ x 11. Mozart Specialty Corporation, 7-9 North Racine Ave., Chicago, Ill.

TIMKEN SILENT AUTOMATIC AIR CONDITIONING — MODEL FFR.—Folder describing and illustrating the new Timken model FFR air conditioning oil furnaces for use in medium and large size homes. Dimensions, specifications and performance data are included. 6 pp. 8½ x 11. Timken Silent Automatic Division, 100 Clark Ave., Detroit, Mich.

(Continued on page 50)

Why versatile Douglas Fir Plywood is one of today's most important design materials!

There is a grade, a size and a thickness of this "modern miracle in wood" for every use!

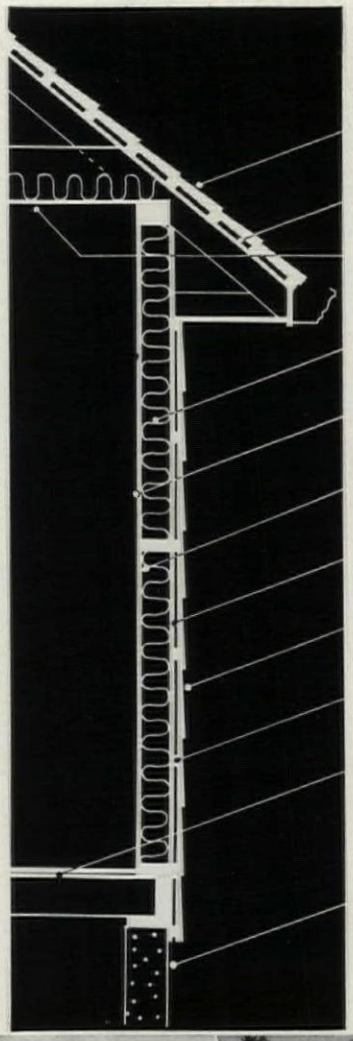
• Douglas Fir Plywood's contribution to modern design is one of increasing importance. Its versatility, large sizes and great strength permit the combination of flexible planning and streamlined beauty with sounder, speedier construction. Thanks to this "modern miracle in wood," interior walls can be beautiful as well as crack and puncture-proof. Sub-floors can be squeakless as well as laid in half time. Walls can be nearly 6 times more rigid than when horizontal board sheathing is used. Concrete surfaces can be formed that are smooth and flawless. A grade or type of this engineered lumber has been developed for every building purpose. Each is stamped with a distinctive "grade trade-mark" to make specification and identification easy and simple.

dri-bilt WITH PLYWOOD *methods are revolutionary!*

Two other important developments are the Dri-Bilt with plywood methods. In the standard Dri-Bilt method, Douglas Fir Plywood replaces conventional materials for sheathing, subflooring, interior walls and ceilings, etc., and is applied by on-the-job methods. In the DFP Dri-Bilt method, wall and ceiling sections, etc., are pre-fabricated from the proper grades of Douglas Fir Plywood away from the job-site in shed or warehouse. Both methods cut weeks from building schedules. Both are accepted by FHA and approved in Uniform Building Code.

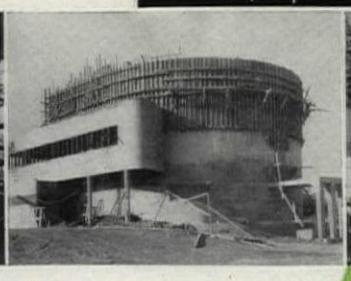
For more information, consult Sweet's Catalog or write for this free literature: Suggested Specifications for Douglas Fir Plywood; Dri-Bilt with Plywood Manuals; Finishing Booklet. Douglas Fir Plywood Association, Tacoma Building, Tacoma, Washington.

★ The diagram at right shows how the various grades of Douglas Fir Plywood should be used in home construction.



• The walls of this attractive living room in Newport-Balboa, California, are 3/8" Plywall, V-joined and lightly stained. The ceiling is Plyscord, painted. This combination was used effectively throughout the entire residence. Frank Green, architect.

• Plyscord is the perfect base for every type of finish floor. It goes down in half time, never warps or cups, makes floor far more rigid . . . an important factor in earthquake or high wind areas. Linoleum laid over Plyscord never shows boardmarks.



• Plyform was responsible for the smooth concrete walls of Station WJSV, Wheaton, Md. James Middlebrooks, CBS engineer; Burton Corning, architect. • (Right) EXT-DFPA was used as exterior finish on the attractive Life House in Portland, Ore.

GENUINE DOUGLAS FIR PLYFORM Concrete Form Panel D.F.P.A. INSPECTED

GENUINE PLYWALL Douglas Fir Plywood WALLBOARD D.F.P.A. INSPECTED

SPECIFY DOUGLAS FIR PLYWOOD BY THESE "GRADE TRADE-MARKS"

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GENUINE PLYSCORD SHEATHING D.F.P.A. INSPECTED

DOUGLAS FIR PLYWOOD *Real Lumber* MADE LARGER, LIGHTER SPLIT-PROOF STRONGER

PUBLICATIONS ON MATERIALS AND EQUIPMENT

(Continued from page 48)

QUIET MAY AIR CONDITIONING UNITS.—Series of folders announcing and describing three new winter air conditioning units. Ratings and dimensions. 8½ x 11. May Oil Burner Corp., Baltimore, Md.

Published by the same firm, "Yours for a Warm Friendship." Publication No. C-134 covers the complete line of Quiet May oil heating equipment, including the double sapphire jewelled Econo-Atomizer, Gerator pump, conversion burners, Ther-May-lator and inserts, dual utility oil heating units and air conditioning units. 8 pp. 8½ x 11.

MANUFACTURERS' DATA WANTED

JOHN L. COLETTI, *Architect,* 12 Ridge Street, Providence, R. I.

ARTHUR K. STEVENS, JR., *Architect,* 702 National Bank Building, Charlottesville, Va. (Data for complete A.I.A. file.)

OLIVER C. KJAR, *Builder and Contractor,* 6901 Easton Avenue, St. Louis, Mo.

BEN JOHN SMALL, *Architect,* 1835 Grand Concourse, New York, N. Y.

BUCKLEY, ARANGO & LYONS, *Architects and Engineers,* 930-931 Barr Building, Washington, D. C.

McCONNAUGHEY & HEMMERT, *Architects,* 117-2 W. Washington Street, Hartford City, Indiana. (Data for A.I.A. file.)

GENNARO MIANULLI, *Structural Engineer and Builder,* 4718 11th Avenue, Brooklyn, N. Y. (All literature as well as data for complete A.I.A. file.)

IRION, AULER & KOEHLER, *Architects,* 303 West College Avenue, Appleton, Wisc.

VERNON C. SQUIRES, *Architect,* New London, New Hampshire. (Also samples desired.)

EARL BOURQUIN, *Draftsman,* 4427 Beta Avenue, Cleveland, Ohio.

J. S. BEYER, *Draftsman,* 221 Central Park Court, Sarasota, Florida. (Data for use in drafting room, samples, and data for complete A.I.A. file.)

DON BECKER, *Student,* 61 Maryland Avenue, Freeport, L. I., New York. (Data for complete A.I.A. file.)

VINCENT SOLOMITA, *Student,* 512 Grand Street, Brooklyn, New York. (Data for complete A.I.A. file.)

ANDREW D. SAKELLARION, *Student,* 2606 Riggs Street, Dallas, Texas. (Data for complete A.I.A. file.)

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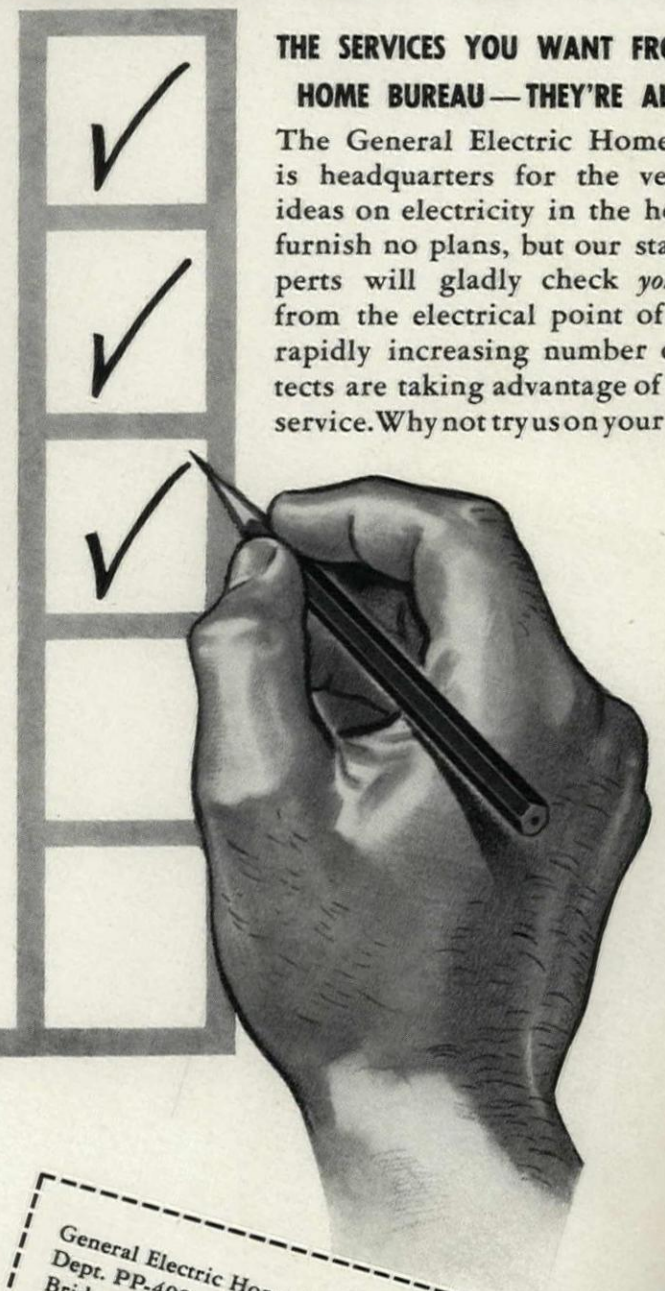
3. WIRING LAYOUTS Our engineers will suggest location of outlets, and will make general recommendations for adequate wiring systems that will give your clients the full benefit of electrical aids.

4. HEATING LAYOUTS We will help on heating and air conditioning problems and make suggestions on placement of outlets and heating plants.

5. HOME LIGHTING G-E publications are available on correct lighting which will be of interest to you.



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POSITIONS OPEN

SALES REPRESENTATIVE WANTED: By old established building product manufacturer, to travel parts of eastern territory calling on special millwork trade and architects. Should have experience obtained in architect's office or special mill and cabinetwork plant to enable reading and listing from plans and be able to quickly grasp construction problems of manufacturer's product. Give age, married, single, religion, employment record. Excellent opportunity with quality manufacturer on straight salary and expense basis for aggressive high-type man. Box No. 1000.

DRAFTSMAN WANTED—For billing and detailing millwork. Must be fully experienced and thoroughly familiar with architect's plans. Give references, age and qualifications. Willingham Sash and Door Company, Macon, Ga.

ARCHITECTURAL OFFICE located upstate, 60 miles from New York, has an opening for a recent architectural school graduate. The work of this office is varied, and consists mostly of hotel, theatre, residential and commercial work. The candidate selected would be given an opportunity to develop his knowledge of architectural design in the preparation of sketches, details and working drawings. He must have a working knowledge of perspective and rendering. Rare opportunity for the right ambitious person. Write giving full history as to schooling, experience, if any, and compensation required. Box No. 1001.

POSITIONS WANTED

STUDENT ARCHITECT, 24, desires position with architectural firm, permanent. Good knowledge of building construction; neat, willing worker; neat lettering and drafting with construction engineering knowledge. Guy B. Edwards, Jr., Route 4, Cisco, Texas.

From managing an art gallery down to fast legal dictation, this secretary-stenographer has experience and ability to fill the most exacting position. Box No. 1002.

SCULPTOR of architectural experience desires to collaborate with architects on courageous projects. Box No. 1003.

ARCHITECT, registered, 15 years' experience on residences and general work, will take position drafting or construction supervision in New York City. Box No. 1004.

ARCHITECTURAL DRAFTSMAN, 8 years' office experience, commercial and industrial buildings. Plans, details neatly drawn, knowledge engineering and design. Box No. 1005.

ARCHITECTURAL DRAFTSMAN and detailer, specialized in Gothic work and ecclesiastical design. 20 years' experience on church and school work. Box No. 1006.

ARCHITECT REGISTERED, New York, 30 years' experience as designer, draftsman and checker, covering residential, commercial, public buildings. Competent, thorough and efficient in office and field. Correspondence invited. Box No. 1006.

WOMAN INTERIOR DECORATOR wants position with architect or interior designer in the Chicago area. Eleven years' experience. Adelaide Mazurek, 3819 N. Odell Ave., Chicago, Ill.

ARCHITECT-DESIGNER, 23, graduate of leading Southern school. 3 years' experience and recommendation with outstanding and nationally recognized architect. Rapid, accurate drafting and delineation. Miles E. Falls, 97 Wembley Road, Lake View Park, Asheville, N. C.

TWENTY-FIVE YEARS' experience planning, design, specifications and supervision of industrial, commercial and multiple dwelling buildings with leading architects. Can make a real contribution to an office with work to do under the defense program. Box No. 1007.

SPECIFICATIONS, articles typed reasonably and neatly. Miss J. Richardson, Box 735, Billings, Mont.

DESIGNER-DRAFTSMAN — would like to locate in New England States. Experienced on church, school and residential work. Successful with presentation sketches done in color. Box No. 1008.

INDUSTRIAL DESIGNER — DRAFTSMAN—estimator, cost analyst. Knowledge bookkeeping—years of experience heavy construction. Wants out of New York executive position with architect or engineer. Excellent references. Box No. 1009.

BASEMENT BEAUTY BEGINS WITH THE FLOOR!

Get the facts about moisture-resistant ARMSTRONG'S ASPHALT TILE

THE drab, space-wasting cellar is gone for good . . . today, the up-to-date architect or designer provides a smart basement recreation room. An excellent starting point is an economical, attractive floor of Armstrong's Asphalt Tile—the only type of resilient material which can be used over concrete in direct contact with the ground.

The 41 beautiful plain and marble colorings of Armstrong's Asphalt Tile make it easy to design basements which will meet with clients' sure approval. This floor is quiet and comfortable underfoot, too. Maintenance? Only routine sweeping, occasional washing and waxing. Cigarette burns can be removed. Costly refinishing isn't required.

Yet, with all its advantages, Armstrong's Asphalt Tile is really low in cost. Get all the facts. See "Sweet's Architectural File." Or, send for free, color-illustrated booklet—*Floor Beauty at Low Cost.* Armstrong Cork Co., Building Materials Div., 1206 State St., Lancaster, Pa.

A FAR CRY *from the dusty, littered cellar of yesterday is this trim, modern recreation room in the George Davis residence of Manheim Township, Pennsylvania, with its practical, beautiful floor of Armstrong's Asphalt Tile (installed by Piersol Company, Inc.). Active ping-pong players can't scuff the colors off this floor, as the patterns run right through the material. Blocks are handset quickly and easily.*

ARMSTRONG'S *Asphalt Tile*

MADE BY THE MAKERS OF ARMSTRONG'S LINOLEUM

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SEE OUR CATALOG IN SWEET'S
Section 16/33

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He would naturally expect devices designed with the sole idea of producing the safest and surest possible means of exit, to cost him more than some other type of device. Yet, over the period of their use, genuine drop-forged Von Duprins will actually cost him LESS!

When you show him that the higher first cost of the Von Duprins is quickly absorbed by their freedom from maintenance expense, he too will realize that they are not only tops for performance, but for economy as well.

Specify . . . and insist on getting . . . the genuine.

VONNEGUT HARDWARE CO., INDIANAPOLIS, IND. . . . . *Von Duprin Fire and Panic Exit Latches are Listed as Standard by Underwriters Laboratories, Inc.*

the new TIFFANY & CO. building started with a pencil

The architects of the new Tiffany & Company building at 57th Street and Fifth Avenue, New York, the firm of Cross and Cross, have utilized every new development in building construction while keeping the exterior dignified, conservative, in keeping with the traditions of the House. Three huge trusses, running the breadth of the building, permit a main sales floor 85 x 100 feet with a ceiling height of 24 feet, without column, pillar or obstruction. Wide aisles, specially designed counters, ingenious lighting, air-conditioning which is an integral part of the structure, all combine to create maximum comfort and convenience for customers.

Before such a building can be produced in stone and steel, glass and mortar, another building must rise from drawing board and draughting table—*a building in pencil*—the sketches, working drawings, renderings, blue-prints of architect and engineer.

Venus Pencils are produced for just such men on just such jobs—tools for them, as carefully made and jealously watched as the precious work they create. Knowing this, more architects and engineers select Venus than any other pencil. One of the 17 uniform degrees of black Venus lead, each made by the exclusive *Colloidal Process for extra strength, provides the exact answer to every technical pencil need. We would be pleased to send you samples in the degree you require. Address Dept. A.

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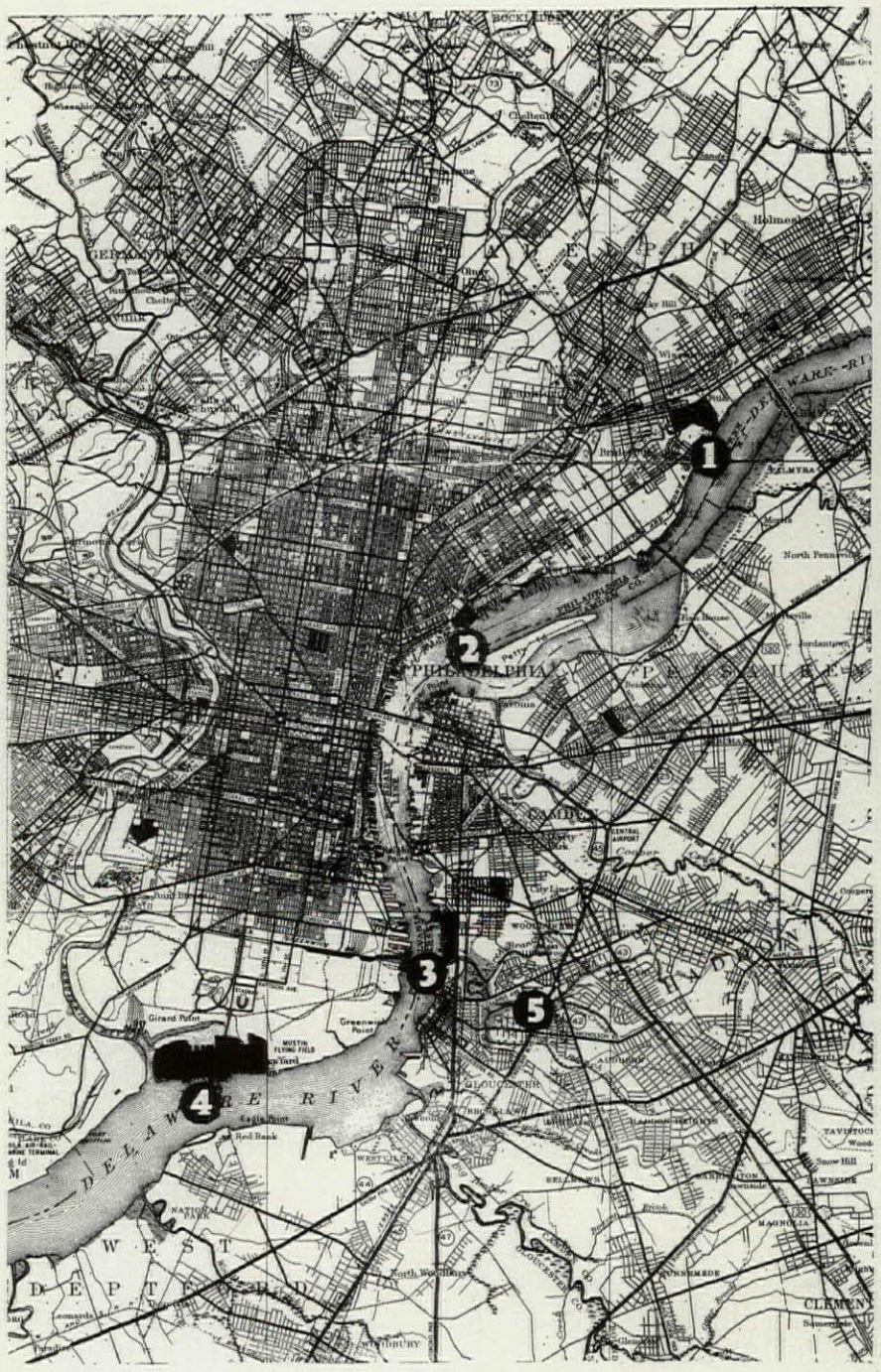
THE DEFENSE IN PHILADELPHIA

Their location, far from the center of their parent cities, will create a housing problem for Philadelphia's defense centers: (1) *Frankford Arsenal,* (3) *New York Shipbuilding Corporation Yard,* and (4) *Philadelphia Navy Yard.* From figures collected on a recent tour I estimate that these places have taken on a total of at least 9,000 employees since the beginning of 1940. They expect to add 17,000 more between now and 1942. Nearer the center of the metropolitan area, Cramp's shipyard (No. 2 on the map) which was shut down in 1927, will reopen soon. This is expected to employ at least six thousand. All these numbers added to the 7,700 employees which a *Philadelphia Housing Association Survey* indicated had been taken on by miscellaneous industries in the Quaker City recently add up to quite a tidy housing problem.* Many of the workers, skilled mechanics, machinists, etc., will have to be imported into this metropolitan area. The housing supply here is overdrawn already.

A recent comment by a representative of the shipyard workers suggests that the automobile, a new factor since the last war, may have less influence on the location of defense housing than is commonly imagined. Speaking before the House Committee on Public Buildings and Grounds recently, *John Green,* President of the Industrial Union of Marine and Shipbuilding Workers, said: "We are told that the housing problem is not so acute as in the last war because today the average worker has an automobile and can commute to his job. There are two things I want to say about that: First, in Camden and other shipbuilding centers you will find that we have now combed the area from which it is practical for workers to travel by auto; second, it may be all right to drive long distances to work in the summer months, but it is not all right in the winter, and in any case, workers get sick after a while of wasting all those good hours on the road and of spending money on gasoline and tires that should be going for necessities for the family or for recreation and savings." Incidentally, *"Fairview,"* built as Yorkship Village during the last war, was ideally situated to serve the New York Shipbuilding Corporation's yard (No. 5 on the map. Photos of this community appeared in PENCIL POINTS for September).



A local squabble has developed about fixing a location for houses for some of the six thousand employees which the Navy Yard has taken on since 1939. In August, *Rear Admiral A. E. Watson,* Commandant of the Philadelphia Naval District, asked the City Council for 1,000 houses and said he wanted them built in South Philadelphia near the yard. "That old admiral is the only one who wants to build those houses down there. Who wants to live in that swamp?" an official of the shipyard workers' union said to me. When I questioned a representative of the Philadelphia Housing Authority about the proposed site he defended it, saying it was near one of the best parks in the city and that the label "swamp" was libelous.

The unnumbered blackened areas on the map indicate PWA and USHA housing projects, completed or under construction. Their positions, far from the centers of Camden or Philadelphia in all cases but one, indicate that the government agencies have been guided by a low-

(Continued on page 58)

* *The Philadelphia Housing Association has just issued a pamphlet* HOUSING AND THE NATIONAL DEFENSE. *This summarizes conditions in the city and can be obtained free by writing the Association, 1717 Sansom St., Philadelphia.*

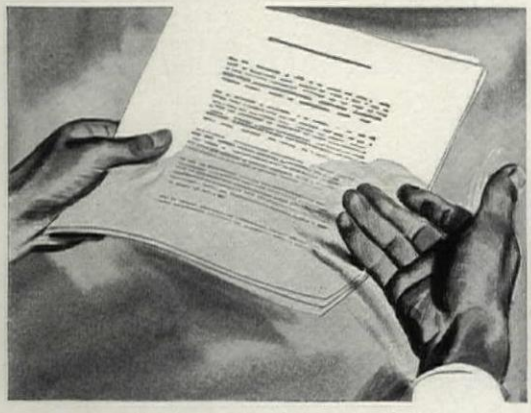
Survey on Wind Damage Shows

the best records have been made

by Pitch and Gravel Roofs

GE TO ROOFS by wind is often a serious m. Some of the wind damage is done tion. Some is done by wind getting exposed laps of roofing and ripping ge sections."

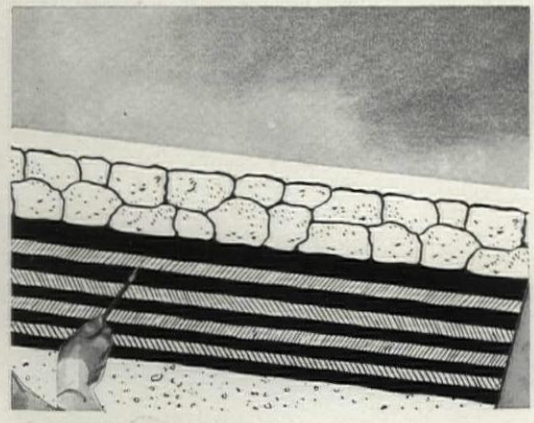
ARE the records on this?"



"A TAR ROOF has 400 pounds of gravel or 300 pounds of slag every 100 sq. ft. That alone is considerable protection against wind damage. Laps aren't exposed; the whole roof is tightly sealed by heavy top pouring of coal tar pitch."

"THE EFFECT of this is shown by a survey made by one company which is interested in roofing problems. It kept records of about 7,500 roofs over a five-year period ending last fall."

MAGE to roofs without gravel or aces was more than twice as fre- to coal tar pitch roofs . . . and the was almost six times as much."



"WHEN YOU REALIZE that the pitch and gravel roof not only has greater resistance to wind damage but also greater resistance to sun damage, to water damage, to hail damage, to fire damage . . . you know why the coal tar pitch and gravel roofs have made the fine old records for long life."

When you hear of a built-up roof that has lasted 30 or 40 years, you usually find that it is of coal tar pitch. Nothing has happened in the roofing business to indicate that any other type of built-up roofing can equal those old records of the tar roofs.

For your own sake, specify Koppers Coal Tar Pitch Roofing.

OTHER KOPPERS PRODUCTS:

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PPERS COAL TAR ROOFING—KOPPERS COAL TAR WATERPROOFING

KOPPERS COMPANY, PITTSBURGH, PA.

K O P P E R S *products*

(Continued from page 56)

price land policy in picking sites. It is not alone their distance from the yards which puts them beyond reach of shipyard workers: their wages averaging $36.00 a week are above the eligibility limit. Fortunately, naval construction legislation recently passed removes the tenant income restrictions on emergency projects to be built in future by the USHA or the Navy Department.

Philadelphia's Real Property Survey for 1939 indicates that USHA projects have made no very great dent in the housing shortage. The ratio of families to dwelling units rose from 95.3% in 1934 to 96.7% in 1939. In Camden the situation is even worse. *Horace R. Dixon,* the executive director of the city Housing Authority, reported recently: "Right now our working population is up to 51,000 against a normal 41,000 with the defense program just starting. We're worse off than we were during the last war. Then we had more vacancies, but there hasn't been any building since, and in the past two years we've lost about 1,000 units, some through demolition and others because they just gave out from age. Why, three months ago we had to order 60 families out of *Westfield Acres,* our Federal housing project, to take in families with lower incomes —and the 60 families are still there. We haven't been able to find other homes for them. We can't kick them out into the street.

"It's almost impossible to rent anything. The real estate men are holding the few available houses for sale. They can afford to hold out in this type of market. And they're hiking rents all over town. That began around April 1 when the war orders started coming."

Driving through Camden I saw many an old box being renovated into a house. In Gloucester, just south of Camden there is an old cotton mill (c. 1870) on the shore of the Delaware River. The row houses which were built at the same time as the mill, according to the custom of those days, are now being renovated to rent to employees of the shipyards not far up the road. I went into one of these houses and noticed that despite the clean, new wallpaper on the walls and the rudimentary cleaning of the floors, the place stank, quite literally.

Incidentally, it seems that the existing conditions offer an opportunity to the Philadelphia Chapter of the A.I.A. to get its name on the map. Navy Yard admirals, Housing Authority, and ship-building union officials are expressing learned opinions on the housing question. A humming and a buzzing like that of honey bees comes from the real estate men. But where, oh where, are the architects?

ALAN MATHER

SYRACUSE AIDES

The appointment of *Melvin L. King,* Syracuse, *William Kaelber,* Rochester, and *L. Andrew Reinhard,* New York, as new members of the Cooperating Committee of Architects established in 1936 under auspices of Department of Architecture of Syracuse University has been announced. The Committee is intended to effect a liaison between the academic and professional fields.

Other members of the Committee are: *Ernest Barott,* Montreal; *Louis J. Gill,* San Diego; *Paul Hueber,* Syracuse; *Lorimer Rich,* New York; and *Conway L. Todd,* Rochester.

FALL EXHIBIT

The most comprehensive exhibition of the work of *Frank Lloyd Wright* ever presented to the public is scheduled to open October 29 at the Museum of Modern Art in New York. This show, covering fifty years of Wright's work — beginning with his earliest designs under *Louis Sullivan* and ending with designs now being built—will be part of an exhibition entitled, "Two Great Americans."

The other noted man honored by the Museum is *David W. Griffith,* whose contributions to the art of the motion picture will be analyzed and presented in documents, photographs, and a cycle of films.

The Museum of Modern Art also announces that its Winter 1941 exhibition will be, "The Art of the American Indian," presenting contemporary Indian works and art against a background of tribal tradition. The Spring 1941 exhibition will be a critical recapitulation of the various fields of art entitled, "Since 1930."

HOW SPRINKLERS PREVENTED $450,000 FIRE LOSS AT AIRPORT

Closely nestled inside the Moffett Hangar at the famous New Orleans Airport on the night of November 11, 1938 were 32 planes with wing overlapping wing. Suddenly at 8:30 P. M., fire flashed from the wing of a plane being repaired. In less than a minute, as flames raced across the wing surface, a remarkable new type of sprinkler system went into action. Automatically, it sounded an alarm and deluged water on the burning plane and those in the surrounding area. Within five minutes the entire fire was extinguished at a loss of only $1700.

This amazing new sprinkler system was the Rockwood Dualguard Deluge System — designed especially for airplane hangars with their severe fire hazards of quick-burning contents, high ceilings and remoteness from fire departments. Fast, sure action of the fire protection system is imperative — that's where the Rockwood Heat Actuated Devices which operate on the revolutionary principle of Temperature Rate-of-Rise are so important. These start water flowing instantly and automatically as soon as the room temperature rises faster than a predetermined rate — long before any device operating at a fixed temperature would go into action. Once the system goes into operation it delivers huge quantities of water — a real deluge to drown the fire at once and protect the neighboring planes and the hangar, as it did at New Orleans.

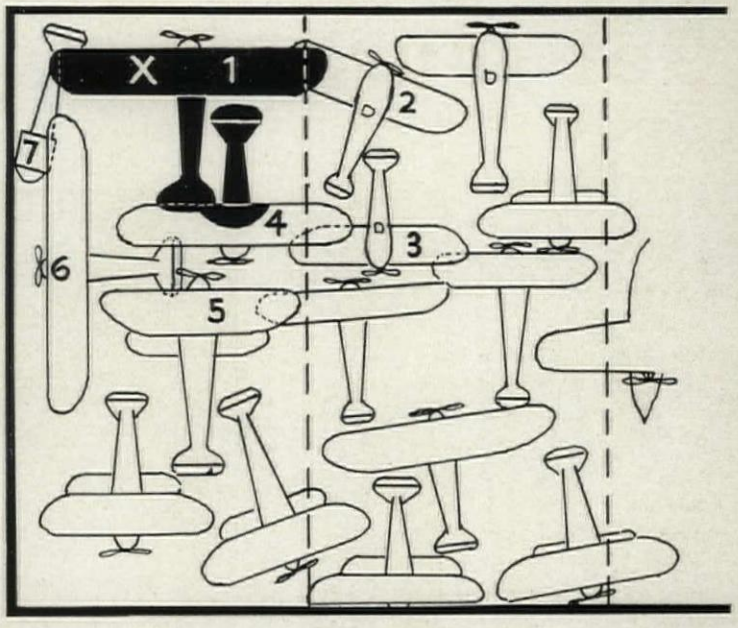


Diagram shows the interior of Moffett Hangar. Fire first started in plane No. 1 on the underside of the wing at the point marked X. Sections of the three planes which were burned are shown in black. Following is a summary of the damage to the planes in the immediate area:

No. 1 Plane — Damage $1100 — Fabric burned from wings and fuselage, instrument panel destroyed. Salvage: undamaged motor, landing gear, framework and propeller.

No. 2 Plane — Damage $100 — Fabric burned off top side of wing for distance of about 4 feet, where overlapped by plane No. 1. Salvage: undamaged entire remainder of ship.

No. 3 Plane — No damage — though overlapped by plane No. 4.

No. 4 Plane — Damage $500 — Fabric burned from tail, underside of wing and a portion of the upper surface of wing. Salvage: undamaged motor, propeller, framework, landing gear, instrument panel.

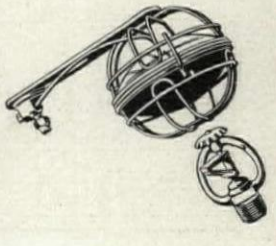
No. 5 Plane — No damage — though nose to nose with No. 4 plane.

No. 6 Plane — No damage — though overlapped by No. 4 plane.

No. 7 Plane — No damage — though overlapped by No. 1 plane.

More important, the rapid action of the Rockwood Dualguard Deluge Sprinkler System prevented any damage to the other planes and the hangar itself — a total valuation of $450,000.

WRITE! More detailed account of this fire and description of Rockwood Dualguard Deluge System are contained in booklets which will be sent on request. Protection of planes is vital from the standpoint of national defense and insurance savings. If you are planning a new hangar or are interested in the protection of an existing hangar, specific engineering information will be gladly sent. Write or wire now—no obligation.



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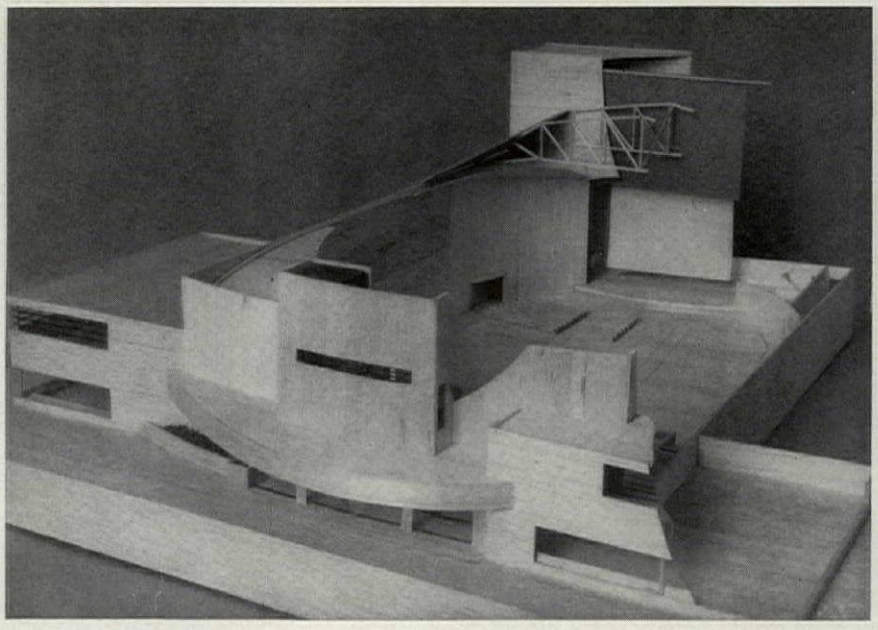
THE CLINIC AS AN ADVANCED COURSE

EDITOR'S NOTE—*We are indebted to George B. Brigham, Jr., of the College of Architecture and Design, University of Michigan, for the discussion below of the educational value of a college-sponsored students' Architectural Design and Building Clinic.*

For years the architects have criticized the schools of architecture for turning out graduates who were of little immediate use in the practice of architecture. Many schools have replied that their emphasis on architecture as a fine art was important because of the difficulty of learning it as such in an office. They have also insisted that office practice could not be taught in the schools because it would limit the time available for academic design.

The trouble seems really to be that design as taught in college has not included all the elements of architecture. Structure, materials, acoustics, and mechanical equipment have been almost entirely omitted



Cinema space requirements were studied by Sidney C. Little in this model

University of Michigan Architectural Clinic students learning framing

from design and taught as separate subjects unrelated to the building as a whole. Thus design in an office, including of necessity all these elements, is quite a different thing from design in the schools, and it is no wonder that a graduate fresh from college finds difficulty in handling this all-inclusive design.

It has become increasingly difficult to learn architecture in the office of a practicing architect. The rapid increase in scientific and technical knowledge necessary for the successful practice of architecture has made this apprentice method next to impossible. This difficulty has been increased also by the pressure of business competition in the offices. Few offices can now afford the leisurely pace of the old days when the whole staff felt free to take time to educate the apprentice. Practicing architects nowadays must have assistants with experience in the actual practice of architecture. Thus the college graduate is at present faced with the necessity of several years' apprenticeship with a continually smaller chance of finding a place to get it.

There has been much talk and writing on this problem of the newly-graduated student of architecture, but the schools in general have done little about it. This is partly because of their belief that the practicing architect could and would continue the education of apprentices, and partly because they have been afraid of becoming trade schools. The difficulty seems to lie also in the different aims of the

A skilled mason directed students laying up brick bonds and wall sections

schools of architecture. To some, architecture is apparently a more or less arbitrary and academic arrangement of plan, line, mass, form and color according to traditional aesthetic rules. Of course, the living spaces are arranged in general as required for the given activity, but where human needs conflict with aesthetic requirements the latter usually take precedence.

To other schools, architecture is a living vital science and art inseparably intertwined with human activity. Space is organized and in-

Professor Brigham assists a student in specification writing. Photos by Ivory

closed for specific use and that use takes precedence over axial arrangement, symmetrical masses or other similar arbitrary requirements. This organic arrangement of space inclosed with appropriate materials, skillfully used, can result in sound, logical design which, in the hands of a sensitive artist, becomes also imaginatively satisfying in form.

For years the University of Michigan College of Architecture and Design has been adjusting its curriculum to keep in step with the changing needs of the latter definition of architecture. Last winter a course was introduced for seniors and graduates to help bridge the present gap between college and the practice of architecture. The course is called an *Architectural Clinic*, because its aims and methods are similar to student clinics in the other professions. In this course the student architect meets the client under the supervision of registered architects (either members of the faculty or architects in local practice) and under conditions similar to those used for the student of medicine or dentistry. He discusses with the client the problem involved, inspects the site, analyzes the problem, holds frequent conferences with the client, makes preliminary sketches, and finally working drawings and specifications.

The supervisor stays in the background as much as possible, thus throwing onto the student all the responsibility of which he is capable, in order to advance him more rapidly toward an independent professional practice. At present the student does not assume the responsibility of dealing with the contractor. While acting in an advisory capacity, however, he makes frequent inspections during construction, reporting to the owner any improper methods or deviations from plans, but he does not have authority to deal directly with the contractor. The ability to handle this work in a realistic and satisfactory way is developed throughout the undergraduate years. This Clinic is, therefore, the logical culmination of the present College curriculum.

Beginning with the second semester in College, the student of architecture studies simultaneously the organization of space for use and the elements of inclosure.

At first simple traditional wood frames, roofs, masonry walls, openings, and similar details are studied. Then the student experiments with newer methods devised by others, or tries out his own ideas. To facilitate this study, wood-framed models are built at one-quarter full size, concrete and mortar are mixed by hand to get the feel of it, and bricks and concrete blocks are laid up. The resulting interest, enthusiasm and ability to think cannot be compared with solely graphic means which, however, follow this contact with real materials.

The student's first contact with the organization of space involves domestic use. Starting with individual rooms or areas of the house, the study continues through the complete planning of all areas interrelated, and then to a small city plan group where each house must be located and planned in relation to all the others. Emphasis on the interior living spaces always takes precedence over the exterior, which is developed as the logical expression of the interior.

Scale models take precedence over graphic means in this course also, and make internal spacial relations appear much more vividly to the student. Study drawings of plans and elevations accompany the study by model, and final drawings accompany the final model.

The broad scope of this introductory course with its emphasis on scientific method and social and economic needs is supplemented by the study of abstract design. In this way the imagination is aroused and stimulated along with the intellect. Throughout the undergraduate years this interrelated study of space, material, and abstract design is continued. Statics, strength of materials, theory and practice in concrete and steel parallel intermediate space design problems and must precede all advanced design. Structural design, as well as space design, is studied by means of models which help to clarify the interrelation of form and function.

The first question asked of a clinic student by a client is how much will it cost, or how much house can I have for so much money? A course in cost analysis helps to prepare the student architect for this question.

Conventional and experimental methods of construction are studied and compared, and related always to local prices and conditions. The student also plans and estimates the cost of several small dwellings of different size before he meets a client.

Specification writing is anticipated in the courses on costs and earlier courses on materials. The actual writing is done by the card file system whereby the student is aided by the experience of his predecessors and instructors, and he adds his contribution to the file as well as writing the specification at hand.

The Clinic has been received enthusiastically by the local architects. With an agreement that commissions will be limited to buildings not exceeding $6000 in cost, the architects agree that the Clinic will *not compete* with their business, but will *help* them by increasing appreciation of the services of an architect.

ILLINOIS TECH

The creation of "The Illinois Institute of Technology," through merging Armour Institute of Technology and Lewis Institute, has been announced following a formal meeting of the Board of Trustees of the new institution. *Henry T. Heald*, thirty-five, President of Armour Institute for two years, has been elected President of Illinois Tech. Sixty prominent business men of Greater Chicago comprise the Board of Trustees and the union results in the formation of a technological education center having about seven thousand students.

AT LARGE IN THE LIBRARY

THEY BUILT THE CAPITOL, *by I. T. Frary ($4.00, illustrated, published by Garrett and Massie, Richmond, Virginia).*

I. T. Frary has done a service to all architecturally-minded people in presenting this story of the building of the Capitol. Here is unfolded the whole thrilling picture of the designing and erection of a building, which in sentiment and historical significance claims the affection of all Americans. Started at the very beginning of the Republic and continued for over one hundred years—always with the best available talent — this great building truly represents our architectural taste through many generations. When our taste was high it was reflected in the fabric of the building — when it was mediocre that fact was recorded in stone and marble—and the periods of decadence are permanently set down in enduring form and material.

The list of architects, artists and assistants is a roll-call of American talent. *Thornton, Latrobe, Bulfinch,* and *Walter* occupy the principal architectural roles, supported by *Hallett, Hoban, Hatfield,* and *Mills*—to mention the more prominent of the assistants. These men all parade through this work beginning with the competition for the design in 1792 and continuing to the completion of the West Terraces and the landscape architecture by Olmsted in 1886. This story is illustrated with many photographs, drawings, and prints, all making an excellent and inspiring reference work, especially for those unable to secure copies of *Glenn Brown's* rare but definitive "History of the United States Capitol."

Mr. Frary is an architectural antiquarian and his affection for the Capitol is displayed throughout the entire volume. He is conscious of the historical and sentimental value of the building and well knows its tremendous worth and its visual appeal to all Americans.

For 110 years the central part of the Capitol (with the exception of the dome) has stood practically as approved by General Washington and Thomas Jefferson. For 75 years the entire building has existed as you see it today. Such evidences of our historical and cultural growth are most precious and must be preserved.

Curiously enough, Mr. Frary has made no mention of the recent persistent efforts to extend the East Front and thus to obliterate a great portion of the old work of the central section. It is hard to understand why Mr. Frary's researches did not bring him into contact with these efforts, which would have swept out of existence much of the very architecture that gave rise to this book.

In 1935 and again in 1937 legislation was introduced to extend the East Front of the Capitol from twelve to thirty feet eastward, to add two more columns to the central portico, and to do the entire work in marble supplanting the painted sand-

(Continued on page 64)

(Continued from page 63)

stone of the present structure. These efforts were bitterly fought by many architects and laymen. The American Institute of Architects in their Annual Convention in 1937 devoted an entire session to the proposals and condemned the entire project. The whole story is available in the records of the 74th and 75th Congress.

The East Front of the Capitol stands practically as it was designed by Thornton and adopted by General Washington, President of the United States. It is historic. It represents the efforts of Thornton, Latrobe, and Bulfinch, three of our most distinguished architects. It reflects the critical judgment of Washington and Jefferson. It has met with the favor of the American people for 130 years. It is one of the milestones of American architecture, it is the first architectural structure of this country as an independent Nation.

These proposals would have completely obliterated Thornton, Latrobe, and Bulfinch from their just due as Architects of the Capitol. It would have severed a most pleasing link with the past. It would be most unpopular with the American people. The existing central portion of the Capitol as designed by our early Architects and approved by General Washington has a definite appeal because of its charming simplicity, pleasing proportions, and historic associations. It has stood for over 100 years as a valuable example of our early architecture. These changes would have removed the last vestiges of the impressive and historic design of the Capitol bequeathed to the Nation by its founders. It should be cherished.

It seems to me that such a fine story of the building of the Capitol is incomplete if it does not mention these recent menaces. The book would be more effective and more useful if it had included some story of the struggle—so far successful—to retain this glorious building in its original condition.

LORIMER RICH

The new plant of the Coca-Cola Bottling Company of Baltimore has been adjudged by the Jury of Architectural Awards of the Baltimore Association of Commerce the outstanding factory structure completed in that city during 1939. Exterior design, suitability to use, practical and artistic utilization of materials, and adaptability to site and neighborhood were bases of the award. Jesse M. Shelton, Atlanta, Georgia, is the architect. Dr. Douglas H. Gordon of the Baltimore Municipal Art Society headed the jury of selection. The award was to be presented at a meeting of the Association of Commerce

CERAMIC EXHIBIT

The Ninth National Ceramic Exhibition will open October 13, at the Syracuse Museum of Fine Arts, Syracuse, New York, continuing until November 4. A Ceramic Forum open to the public will be held at the Museum that afternoon.

For the annual traveling show a limited number of Ceramic pieces will be selected by a jury of museum and fine arts leaders.

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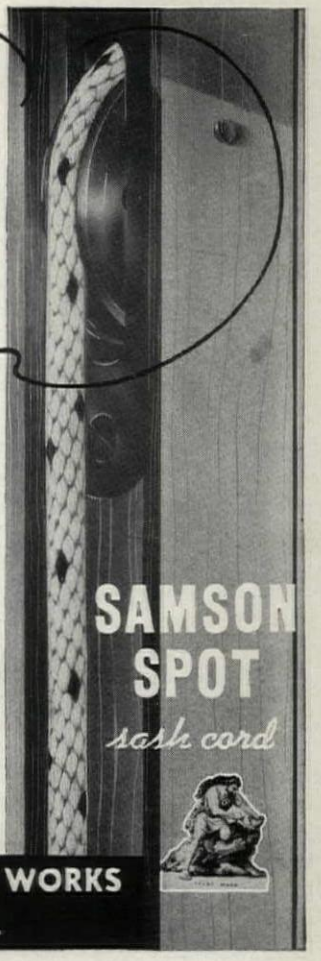

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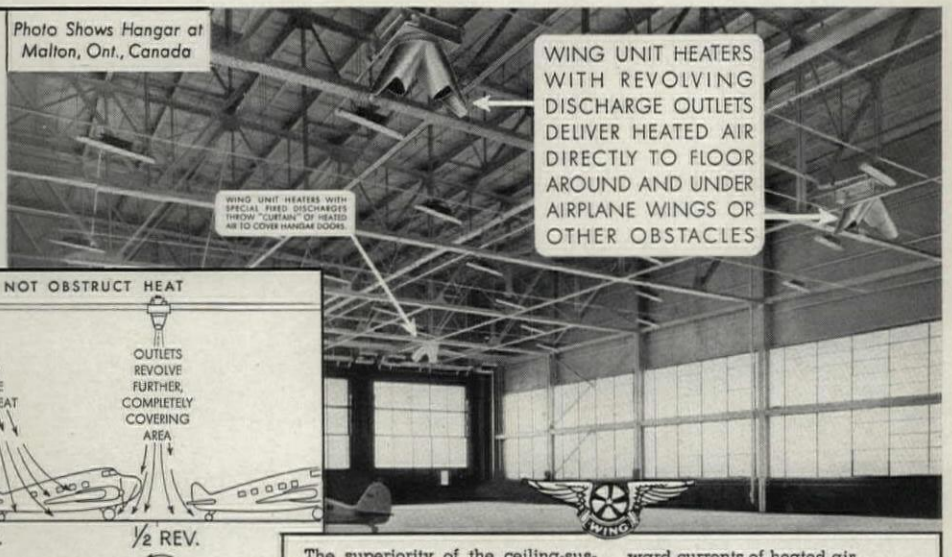

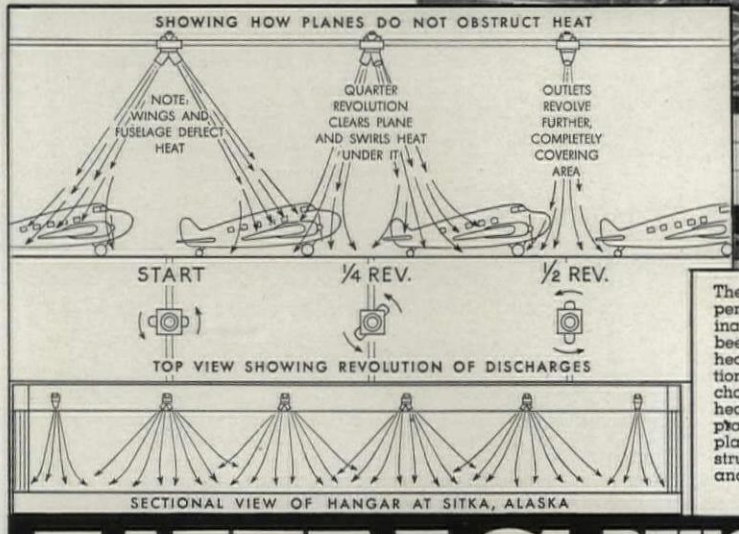

The superiority of the ceiling-suspended type of unit heater (originated in 1921 by Wing) has long been recognized in industrial plant heating. However, until the invention of the Wing Revolving Discharge Heater, ceiling-suspended heaters have not been considered practical for the heating of airplane hangars, because of the obstruction offered by airplane wing and fuselage surfaces to the downward currents of heated air.

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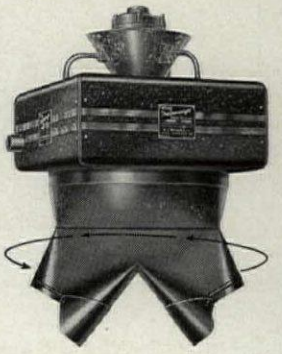
REINHOLD PUBLISHING CORPORATION, 330 West 42nd Street, New York, U. S. A.

NEW PRODUCTS

NEW UNIT HEATER OF REVOLVING DISCHARGE TYPE

The L. J. Wing Mfg. Co., 154 W 14th St., New York, N. Y., has added to its line of unit heaters, an improved high-ceiling heater of the revolving discharge type for heating industrial and commercial buildings.

The new unit heater discharges heated air through outlets which slowly revolve causing air streams to sweep through 360° to penetrate every part of the working area.



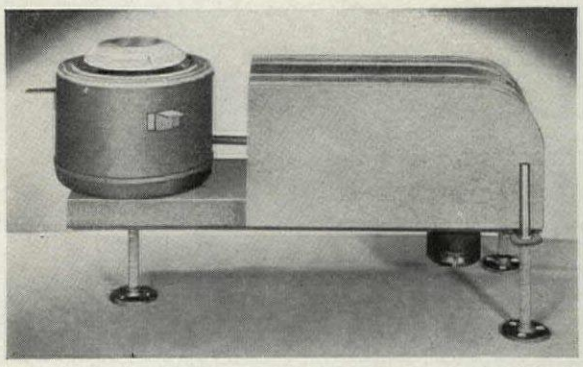
This constantly changing direction of air flow overcomes conditions where plant equipment obstructs complete distribution of heat from fixed discharge type heaters.

The revolving discharge may be attached to any type HC heater in place of the other discharges. Where heaters are already installed, the revolving discharge may be substituted for the present discharge. Two shapes of revolving outlet, designs 4 and 8 are available for every size of HC heater.

NEW AUTOMATIC OIL BURNER FOR SMALL HOMES

The Miller Co., Meriden, Conn., has placed on the market a new automatic vaporizing oil burner which was designed exclusively for heating small homes of five or six rooms.

The new burner uses the lower-price No. 2 or No. 3 oil which makes quite a difference in operating cost during the long winter heating season. The maximum high-fire rating of the burner is said to be nine-tenths of a gallon of oil per hour.



The following controls are furnished with the new burner: constant level valve; thermo-valve top which controls the constant level valve; room thermostat; transformer and draft regulator. The constant level valve, after going into action, resets itself automatically. Factory-adjusted air and oil flow are said to insure maximum combustion efficiency. A pilot flame makes it unnecessary to incur expense of oil igniting electrodes, gas pilots, etc. It operates at high fire only when the thermostat calls for heat. At all other times it operates on the pilot flame. This insures minimum consumption of oil throughout the heating season.

(Continued on page 69, Advertising Section)

(Continued from page 68, Advertising Section)

FRANTZ COMPLETE GARAGE DOOR UNIT

The Frantz Mfg. Co., Sterling, Ill., has added to its line of overhead door equipment, the No. 10 garage door unit. This is the first time the company is offering a complete unit consisting of door and hardware. It is prefitted for 8 ft. wide by 7 ft. high openings.

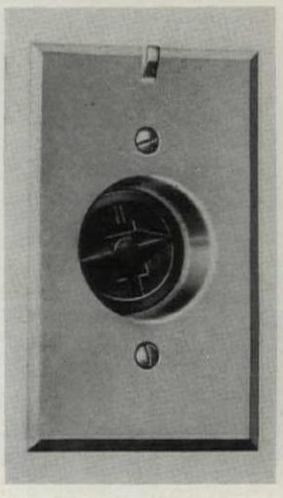
The new unit is said to be easier to operate because its load is lighter. The door is toxic treated for resistance to rot. The panels are laminated fir with the exception of two that are glazed.

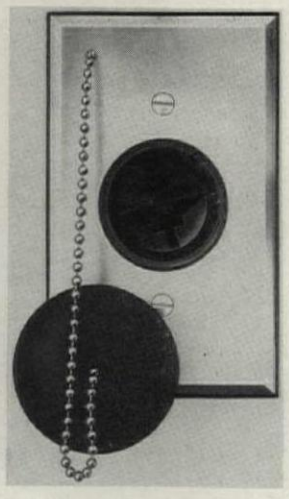
The door rises up, completely in, out of the weather and out of the way. Only 2 in. of clearance are required above the door opening. Over-the-Top door equipment employs no weights, chains, pulleys or cables to supply or transmit power.

Rain, cold and snow are sealed out by steel weatherstrip. Angle irons across top and bottom join the two door sections into one rigid unit and prevent warping. The latch engages on both sides for complete protection. The lifting power of springs is easily increased or decreased by simple adjustment.

NEW G-E ELECTRIC CLOCK AND OUTDOOR OUTLETS

Two new moderately-priced special electrical outlets, one designed for use with electric wall clocks and the other for outdoor use in all weather, have been introduced by the appliance and merchandise department of the General Electric Co., Bridgeport, Conn.





The new clock hanger outlet illustrated at left, provides both mechanical support and electrical connection for clocks, eliminating the untidy appearance of an extension cord to the clock location from an existing outlet in a room. It includes a brass plate with a hook which is an integral part of the plate. The outlet itself is deeply recessed to conceal the cord and plug, and allows the clock to hang flush with the wall.

The weatherproof outlet, shown at right, is designed for use as an outdoor lighting or appliance outlet or for

(Continued on page 70, Advertising Section)

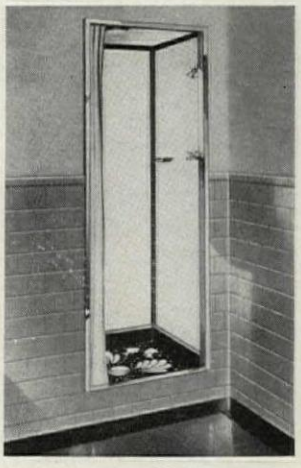
(Continued from page 69, Advertising Section)

use in damp locations. It includes a cadmium-finished aluminum-lacquered plate, a rubber mat for use under the plate to keep out moisture, and a rubber cap. The cap is attached to the plate by a bead chain.

Both the clock hanger outlet and the weatherproof outlet are rated 10 amperes, 250 volts; and 15 amperes, 125 volts.

BUILT-IN CABINET SHOWERS

The Henry Weis Mfg. Co., Inc., Elkhart, Ind., has recently extended its Weisway cabinet shower line to include three built-in models. These are the regular VP Master, BW Master and Standard models with headers, thresholds and integral entrance stiles specially constructed to accommodate a front facing of any type bathroom wall surface. A built-in installation with an entrance treatment both permanent and finished is thus attained that is in harmony with the appointments of the finest bathroom. And, as in the case of the less expensive Standard model, such an installation is well within the means of a modest home.



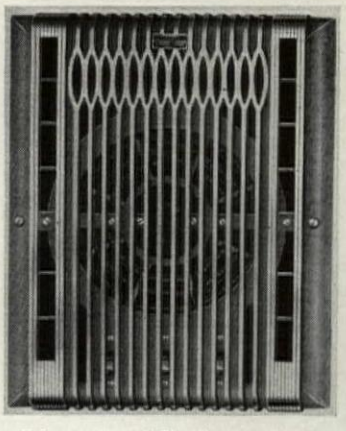
On the VP Master model, the entrance stiles and header are surfaced with a chromium plated brass trim; on the BW Master, they can be furnished with either the chromium trim or in baked enamel to match the interior of the cabinet; and on the Standard model, only the baked enamel finish is available. On all models the threshold is brass, finished in chromium.

Additional features of the built-in models are soundproofed sidewalls and a top-ceiling unit with Weisway Showerlite. For installations of particularly fine appearance, Weisway high- or low-doors can be included.

NEW BUILT-IN-WALL ELECTRIC HEATERS

Two major contributions to heating comfort are introduced in a new line of built-in-wall electric Heetaires manufactured by Markel Electric Products, Inc., Buffalo, N. Y.

One innovation is a heater that provides both a cheerful red glow of radiant heat, and a steady current of fan forced heat. The unit is twelve by eighteen inches, and three inches deep, and built for easy installation in new or old walls.



The other improvement is a fan type heater that uses a new and simplified method of handling air currents. This method is said to assure a steady output of hot air, while incoming air serves to cool the heater box and grille. Some of the models are equipped with a Minneapolis-Honeywell thermostat for automatic heat control.

(Continued on page 71, Advertising Section)

(Continued from page 70, Advertising Section)

NEW SYNTHETIC RUBBER COMPOUND FOR CAULKING, SEALING AND WATERPROOFING

A new all-purpose synthetic rubber compound which is said to permanently retain its adhesion, elasticity and waterproofing qualities has been introduced by the American Bar Lock Co., Inc., Long Island City, N. Y.

Called Ablo synthetic rubber compound, the product contains no disintegrating resins, asphalt or putty, and is applied cold with a gun or trowel. Rigorous tests have demonstrated its ability to seal glass laid horizontally over an opening exposed to the weather. These tests have also proved that Ablo will stand up for the life of the material to which it is applied in many other sealing, caulking and waterproofing jobs.

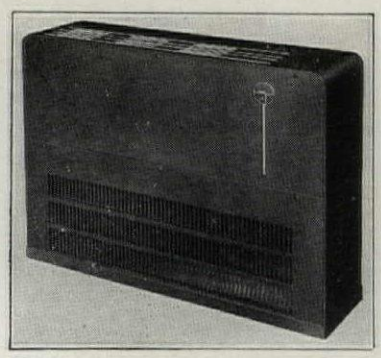
Ablo synthetic rubber compound has a vise-like grip, does not deterioriate when exposed to weather, and is resilient to the expansion and contraction of other materials. It does not powder, become brittle, crack, or otherwise disintegrate. Absolutely watertight, it adheres permanently to wood, stone, brick, concrete, metal, glass and other surfaces.

Ablo is supplied in cartridges for use with the manufacturer's special convertible cartridge gun, or in 1 or 5 gallon cans and 55-gallon drums. It may also be obtained in a heavy paint consistency for painting, waterproofing, rustproofing and preserving work. Further information and literature complete describing Ablo and its many uses may be obtained from American Bar Lock Co., Inc., Ablo Products Div., Long Island City, N. Y.

HERMAN NELSON DE LUXE hiJet HEATER

The Herman Nelson Corp., Moline, Ill., has recently placed on the market the De Luxe hiJet heater, which is designed to provide a quiet and efficient method of heating stores, offices, churches, corridors, markets, etc. Due to the large heating capacity of the new unit and the full distribution which can be obtained, an unusually large area can be heated with one unit. It is available for use with steam or hot water.

The air is drawn through the recirculating grille into the unit through the heating element and filter, and is then discharged into the room through the discharge grille.



The heating element is designed with loops to absorb the difference in expansion and contraction between individual tubes. The entire tube and loop is fabricated of red brass with no connecting joints to weaken construction.

The motor, located in the end compartment out of the air stream, permits full utilization of the suction chamber for the housing of larger fans which in turn permits lower tip speeds and consequently quieter operation. The cabinet is constructed of heavy furniture steel with rounded corners and ends without any projecting parts. It is finished in brown, baked enamel with trim of polished stainless steel.

The unit may be mounted on the floor, placed on the wall or suspended from the ceiling; arranged to discharge upward, downward or horizontally. It is furnished in six sizes with capacities from 24,800 B.T.U. and 250 C.F.M. to 145,200 B.T.U. and 1685 C.F.M.

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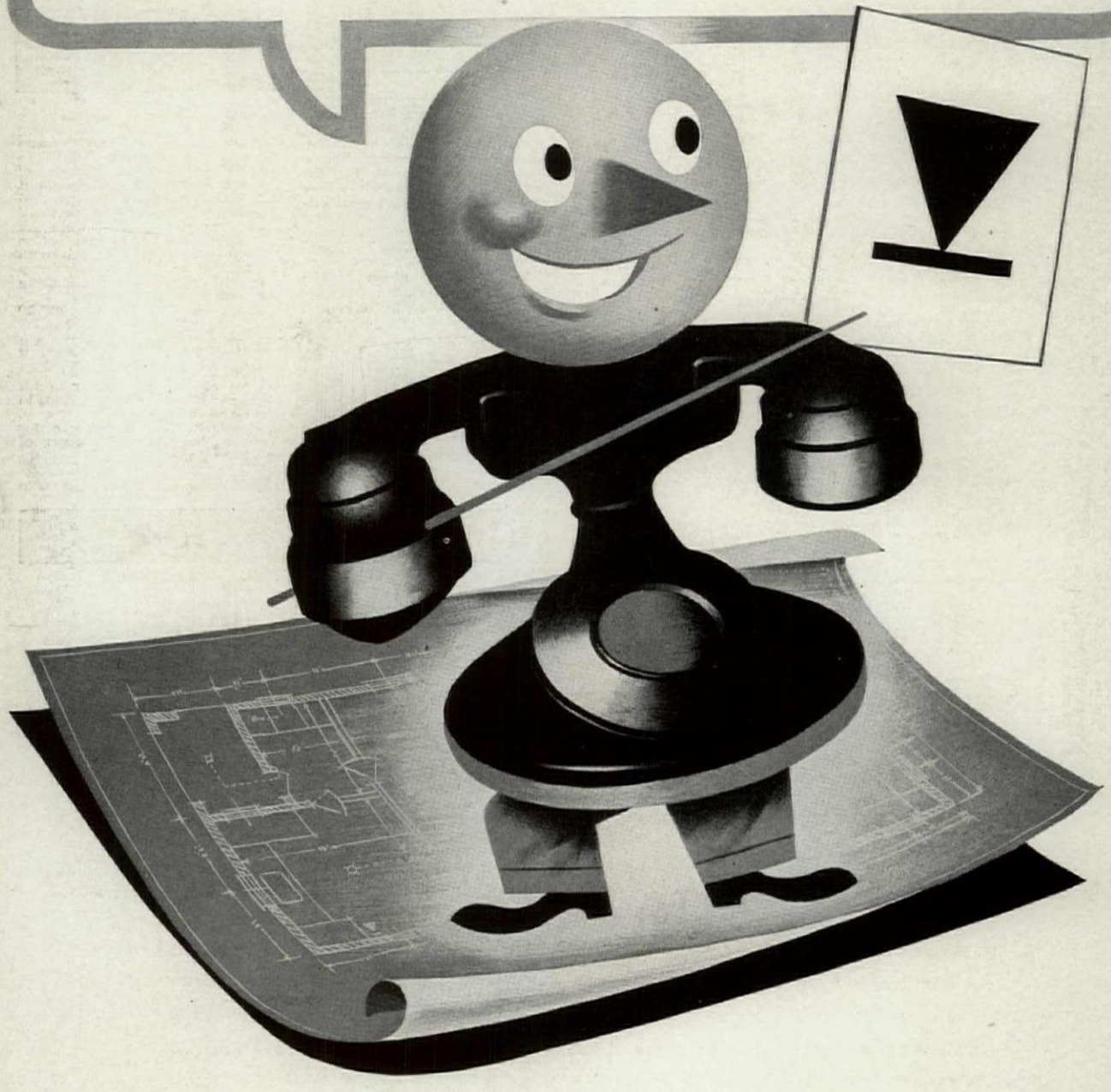
Northwest Representative: F. A. Bartlett, 1423 Joseph Vance Bldg., Seattle, Washington.

Here's the key to good telephone planning



A SMALL TRIANGLE is the symbol you use to indicate a telephone outlet. This symbol, included in the plans you draw, is assurance that your clients will never have their walls and lovely woodwork marred by drill-holes and exposed wiring.

Telephone outlets should be planned before construction begins. Modern construction methods and materials make it virtually impossible to conceal telephone wires unless built-in facilities are provided. Inexpensive pipe or conduit installed in the walls at the time of construction serves this purpose.

Even the smallest home should have at least one outlet on each floor. Additional outlets should be located wherever an extension telephone would be a convenience.

Your telephone company will be glad to co-operate in planning efficient, economical telephone facilities. Just call the Bell Telephone Business Office nearest you and ask for "Architects' and Builders' Service."

SPECIFY "PENNVERNON"... NOT JUST "WINDOW GLASS"

THE distinctive Pennvernon label is your assurance of quality window glass. It identifies a glass genuinely worthy of good windows. For Pennvernon is clear. It is brilliantly finished on both sides of the sheet. It possesses a quality of reflectivity and freedom from distortion exceptional in a sheet glass. It affords good vision. And each light is paper packed to protect the glass during shipment. Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Pa.

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STORE FRONT DESIGNERS—

Secure new effects—with lustrous ALUMINUM FACING!

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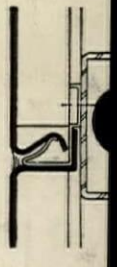
POSSIBILITIES for the dramatic use of aluminum in store front design have been greatly increased by Kawneer's introduction of K.Z.S. Aluminum Facing.

Available with plain or corrugated surface, these superior facing panels may be used with colorful K.Z.S. Architectural Porcelain Enamel (27 standard colors)—in many interesting combinations. Flat, curved, or special shapes are furnished to meet the most modern design requirements. The durable Alumilite Finish assures a rich, appealing lustre, and lasting protection against atmospheric conditions. Installation is made entirely by mechanical means, with sturdy Supporting Clips and continuous Steel Furring Channels—safe and dependable.

Secure a new effect in your next store front by employing this versatile facing material in conjunction with the complete line of Kawneer Rustless Metal Store Front Construction—fully resilient sash and bars, awning bars, entrance doors, sign letters, and decorative mouldings and shapes. See SWEET'S, or write THE KAWNEER COMPANY, NILES, MICH., for latest details and data.



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