THE ARCHITECTURAL FORUM

IN TWO PARTS  PART ONE

ARCHITECTURAL DESIGN

TRANSPORTATION BUILDING REFERENCE NUMBER

DECEMBER 1930

PRICE $3.00
The RUSSWIN Door Closer is a fitting example of the rugged sturdiness, fine workmanship, parts and materials that enter into every piece of RUSSWIN Hardware.

For the architect's convenience, RUSSWIN Hardware is illustrated and described in Sweet's Catalogue—pages C-3137; C-3216.

The new Columbus Hospital at Great Falls, Montana, is a spacious, attractive structure with every modern provision for the comfort and care of patients. The hardware equipment is RUSSWIN. Whether it be a public institution, a many-roomed mansion or a small home there are RUSSWIN designs in full accord with the style or period selected . . . and made of the finest base metals, brass or bronze. For nearly a century, because of its durability, the beauty of its exclusive designs and the lifetime of trouble-free service it provides, RUSSWIN Hardware has been the choice of leading architects throughout the country. Russell & Erwin Manufacturing Company (The American Hardware Corporation, Successor), New Britain, Connecticut—New York, Chicago, London.
This attractive building was built with white slip glazed brick in order to obtain a material that would retain its original lustre and stand out prominently with its pure white color. Hanley White Slip Glazed Brick is an ideal material for monumental structures giving a dignified appearance at a cost of about one-third more than face brick.

HANLEY COMPANY
Largest Manufacturers and Distributors of Face Brick in the East

BOSTON—260 TREMONT ST. BRADFORD, PA. NEW YORK—565 FIFTH AVE.
What Stone to Use?

HERE IT IS!

Exclusive as the rarest Marble
Appropriate for many Purposes
Capable of any desired Finish
Available in any Size and Form

RED SLATE, is what we are speaking of; found in only one spot: Washington County, New York. The color is of an unusually attractive shade, which we shall be happy to place before your eyes in the shape of a sample piece, free, prepaid, showing also the finish of which it is capable and convincing you of its excellence for:

Window Sills  Chimney Caps  Stepping Stones  Garden Seats
Hearths  Mantels  Fountains  Sinks  Thresholds
Table Tops  Wainscoting  Base Treads

and every other purpose for which such a stone can be utilized.

And of course we can also readily supply—

RED ROOFING SLATE, any thickness, rough and smooth texture
RED SLATE Building Stone
RED SLATE Chips, for Driveways, etc.
RED SLATE Flooring and Flagging
RED SLATE Granules and Flour

And now—shall we send you that sample mentioned above?

F.C. SHELDON SLATE CO.
GENERAL OFFICES - GRANVILLE - N.Y.
• BRANCHES IN PRINCIPAL CITIES •
The simplest formula for eliminating paint troubles: specify high-lead-content paints, preferably pure lead. For lasting satisfaction and long-time economy.

EAGLE White Lead

Made by The Eagle-Picher Lead Company, 134 North La Salle Street, Chicago. Producers also of Eagle Red Lead, Eagle Lead Pipe and Fittings, and many lead, zinc and allied products.
IMPERIAL Hand Made Shingle Tiles were chosen to roof this picturesque clock tower and other buildings on the place of Mr. Leonard C. Hanna, Jr., Mentor, Ohio. Robert O. Derrick, Inc., were the architects.

LUDOWICI-CELADON COMPANY
Makers of IMPERIAL Roofing Tiles

NEW YORK: 565 FIFTH AVENUE
164 S. MICHIGAN AVENUE, CHICAGO
WASHINGTON: 738 FIFTEENTH ST., N.W.
LIKE the musician to whom life is a symphony and the painter to whom the world is a pageant, the able designer constantly aspires to produce work worthy of his vision. In doing so, he naturally seeks a sympathetic medium, one that will faithfully and truly respond to every creative demand.

Northwestern Terra Cotta fully meets this reasonable requirement. It is the perfected product of fine craftsmanship, scientific research and modern equipment. It offers the architect a freedom of expression that is virtually unlimited. In form, texture, surface treatment and color, it presents a medium for creating lasting beauty that has been appreciated and employed by great artists from the time of the Della Robbias to the present day.

The accompanying illustrations show part of a magnificent altar in polychrome terra cotta for Church of St. Thomas Aquinas, Chicago, designed by Henry Schmidt and manufactured by The Northwestern Terra Cotta Company.
Bendix Aviation Building, South Bend, Indiana. Below—roof deck ready for composition covering. The entire roof of Featherweight slabs was erected in winter—an area of over 200,000 sq. ft. And this expanse represents but half the area of Federal roofs in use by this company!

LAYING a Concrete Roof in Zero Weather.

It is done quickly and easily under any conditions, because precast slabs come to the job ready to be hoisted from box-cars and placed directly on the steel roof purlins. The building gets under cover on time—the composition covering may be applied immediately thereafter.

The Featherweight Concrete slab is alone amongst roof constructions in ultimate value—a weight as low as 10 lbs. per sq. ft.—insulating qualities—permanence—fire safety—freedom from all maintenance.

Many of the country's prominent industrial, public utility, railroad and public buildings are protected by this roof. "Catalog and Roof Standards" on request.

Featherweight Concrete INSULATING ROOF SLABS

Made, Laid and Guaranteed by FEDERAL-AMERICAN CEMENT TILE CO.

Executive Offices: 608 South Dearborn Street Chicago
Plants Near CHICAGO - NEW YORK - PITTSBURGH - BIRMINGHAM
FOR OVER A QUARTER CENTURY
The First Requirement of a Partition is—
IT MUST BE EASY TO LIVE WITH! . .

Beauty of design, details of form, and quality of finish, all contribute in determining partition values . . . Hauserman Partitions harmonize with any surroundings . . . create dignified, attractive business homes.

This is No. 2 of a series of advertisements setting forth things to look for when considering partitions.

Well-balanced design and beauty of line mean as much in partitions as in automobiles. And just as one automobile excels another in eye-value, so do Hauserman Partitions stand out alone as the most pleasing in design.

Every detail of these better partitions is carefully worked out to assure permanently pleasing appearance. Rolled forms of finest furniture steel provide beauty of line and detail. Concealed assembly gives them that part-of-the-building look, yet permits easy dismantling and economical rearrangement.

The quality and variety of their finish is unsurpassed. Hauserman Partitions offer a choice of 100 attractive colors and exact duplications of selected grains. All parts are completely finished and all finishing is done in the manufacturer's plant.

THE E. F. HAUSERMAN COMPANY
A nation-wide organization of Partition Specialists
6913 GRANT AVENUE CLEVELAND, OHIO
Factory Directed Planning and Erection Service from these
13 Factory Branches
Newark Philadelphia Buffalo Boston Kansas City
Chicago Pittsburgh Detroit Cincinnati St. Louis
Washington, D. C. New York Cleveland

HAUSERMAN MOVABLE STEEL PARTITIONS
YORKSHIRE SHINGLE TILE

Ever increasing popular appreciation of the beauty of Yorkshire tile as typically fitting for rustic English and Norman design, is proven daily by its increasing demand for the better class homes—wonderfully colorful in softly harmonizing shades from rusty iron blacks thru woody browns to warm fire splotched tans, with numerable middle tones of taupe and mauve casts.

The production of the colors by the exotic play of the fire precludes any exact repetition of color in any two tile. Although steel hard in body structure the texture of the surface is velvet like and non-glaring. Just a beautifully artistic tile, very moderate in cost. Samples and a color sheet are yours for the asking.

Address Dept. "F"
Daisy, Tennessee.

B. Misslin Hood Company
KIL-KRAFT TILES
DAISY, TENNESSEE

Above all things use Hood Roofing Tile
ANACONDA
ARCHITECTURAL
EXTRUDED BRONZE
AND TERRAZZO STRIPS
PLATE 26

SUGGESTION FOR TERRAZZO WALL MAP, INCORPORATING
BRASS DIVIDING STRIPS IN THE DESIGN. CITIES SHOWN BY CAST
BRONZE PLAQUES. COLUMNS AND TICKET WINDOWS ARE
OF ANACONDA EXTRUDED BRONZE STANDARD SHAPES.

THE AMERICAN BRASS COMPANY
GENERAL OFFICES • WATERBURY, CONNECTICUT

Complete sets of these plates may be had for the asking
EXCELLENCE OF CONSTRUCTION
DEMANDS THE BEST EQUIPMENT

Sargent Hardware contributes to the beauty and usefulness of each one of the buildings that make up the great Cleveland Terminal Group — office building, hotel, and railroad terminal. So also Sargent Hardware will add to the complete satisfaction of your own home. This fine quality hardware is a usual specification when excellence of equipment must finish off excellence of construction.

Sargent Hardware covers the entire field of building — hotel, apartment, hospital, public and educational buildings and residences of every size. Designs range from classic, authentic reproductions of the various period patterns to the extreme simplicity of the ultra-modern.

Sargent Hardware, of solid brass or bronze, is extremely durable. Of the finest materials and the most precise workmanship, the operation of each item is lastingly easy and smooth. Now, as for generations, the name SARGENT, on any hardware item, stands for finest quality merchandise. Sargent & Company, New Haven, Connecticut. In New York City — Builders' Hardware Division and Showroom, 295 Madison Avenue; Warehouse, 94 Centre Street. In Chicago—150 North Wacker Drive (at Randolph).
Alcoa Aluminum shows its adaptability to decoration

...windows, doors, trim, grilles, hardware, even to desks and clock

COMPLETE DETAILS ON THE THREE FOLLOWING PAGES
Nine different forms of

The new Fifth Avenue Branch of the New York Trust Company, New York City, shows the infinite possibilities of Alcoa Aluminum in architecture.

In this building, Alcoa Aluminum has been used in the form of castings, forgings, extruded shapes, sheet, rod, bar, wire and tubing—also as rivets and screws.

All entrance doors, gates and grilles; double hung windows; revolving doors; banking room windows; casement windows are made of Alcoa Aluminum. The elevator cab grilles, trim and doors; directory board; grilles; counter screens; check desks;
Alcoa Aluminum were used

wire cages; railings; door saddles; hardware and doors in the banking quarters are made of Alcoa Aluminum.

Alcoa Aluminum permits the architect to design and create a building whose decorative detail will endure permanently. Alcoa Aluminum Alloys resist corrosion; will not streak adjoining surfaces; need not be painted. They take a high polish.

In addition to these distinctive qualities, Alcoa Aluminum Alloys weigh only 1/3 as much as other metals commonly used, yet are equally as strong. Their cost is low—comparable to that of other metals not having the advantages of Alcoa Aluminum.

ALUMINUM
Alcoa Aluminum has definitely proved its many varied and practical uses in structural and decorative effects. Its use is preeminently indicated where factors to be considered are enduring beauty of architectural detail, lightness in weight and consequent speed in handling on the job, and freedom from corrosion. Since Alcoa Aluminum is not affected by ordinary atmospheric gases, it is suitable for use in or near round houses, chemical factories, or places where industrial processes result in a gaseous or damp condition.

SPECIFICATIONS

Alcoa Aluminum Alloys are available in various tensile strengths. All the Alcoa Aluminum products used in the New York Trust Building were made from Alcoa Aluminum Alloy No. 43, having a silicon content of 5%. Their weight did not exceed .097 pounds per cubic inch and the average tensile strength was not less than 19,000 pounds per square inch.

In each of our offices we have representatives familiar with the decorative and structural qualities of the many Alcoa Aluminum Alloys. The services of these representatives are available to the designer and specifications writer. ALUMINUM COMPANY OF AMERICA, 2412 Oliver Building, PITTSBURGH, PENNSYLVANIA.
STORE FRONTS
by ZOURI
in
COLD ROLLED COPPER, BRONZE & ALUMINUM, CAST AND EXTRUDED BRONZE

ARCHITECTURAL CASTINGS | ENTRANCE DOORS
ELECTROLITIC FINISHES | SHOWER STALL DOORS

The Zouri Company

General Offices Chicago Heights Illinois
Associated Companies
International Distribution
WRITE FOR CATALOG
In this structure, the floors and walls—interior and exterior—are of reinforced monolithic concrete. The exterior has no finishing coat—the concrete was purposely left just as it came from the forms. Structural frame is of steel. Exterior ornamentation was cast in place. So built, this edifice offers positive assurance of firesafety and long life, with little if any structural maintenance through the years.

Views are of Building for Christian Science Benevolent Association for Pacific Coast in San Francisco, California. Henry H. Guterson, Architect; Walter L. Hober, Structural Engineer; George Wagner, Contractor—all of San Francisco, California.

PORTLAND CEMENT Association
Concrete for permanence and firesafety
33 WEST GRAND AVENUE
CHICAGO
Residence at Middletown, New Jersey

Charles H. Higgins, Architect

Juder Stone roofing slate is endowed by nature with every quality essential to the ideal roofing material. Beautiful—enduring—fireproof, this product, with its rugged texture and wide variety of colors, offers countless possibilities with stone, stucco, or shingle construction.

Rising and Nelson Slate Company

WEST PAWLET, VERMONT

Architects' Service Department: 101 Park Avenue, New York City

CHICAGO DETROIT BALTIMORE PHILADELPHIA BOSTON
Indiana Limestone Selected for First of New Government Buildings

The first building in Washington's hundred million dollar construction program is constructed almost entirely of Indiana Limestone. This newest addition to the city's fine architecture emphasizes again the importance of materials in achieving the result you are after. It is proof anew that the fine-grained, light-colored stone from the hills of southern Indiana is considered by the architectural profession as suitable for the most noteworthy buildings of modern times.

Indiana Limestone is the logical answer to your demand for a material that is artistically and economically appropriate. By its natural beauty, ease of fabrication and accessibility to the markets of the country, it fills these requirements. Large scale production and modern fabricating methods make it moderate in cost. It is entirely practicable for the small building as well as for the larger project.

ILCO Limestone, from the proven, time-tested quarries of Indiana Limestone Company, provides the high quality limestone required for modern building.

Let us submit an estimate on the construction you are planning. Address Dept. 2266, Service Bureau, Bedford, Indiana.

Indiana Limestone Company

General Offices: Bedford, Indiana
Executive Offices: Tribune Tower, Chicago
“You can have the Job”

“Yes, you can have the job, if you meet this figure!” This figure is invariably that of the lowest bidder on the work. Now one thing is obvious. Had the architect or contractor confidence in the low man’s work, he would not waste his time endeavoring to have a better man meet his cheaper competitor’s bid. The higher man can not do his usual excellent work at the low man’s figure. The solution is to specify PARDEE MATAWAN TILES and to insist on a PARDEE MATAWAN BONDED INSTALLATION. By so doing, you will receive the highest type of material and workmanship at the lowest price for such a combination.

Pardee Matawan Tile Co. Supplies Whatever You Need in Tile

THIS COUPON WILL ACT AS A USEFUL MESSENGER

PARDEE MATAWAN TILE CO.
101 Park Avenue, New York City
Kindly send me without cost or obligation:
☐ Portfolio in color.
☐ Color sketch of enclosed area showing how it will look if tiled in Pardee Matawan.
☐ sketch of tile area
☐ I enclose (with dimensions)
☐ blueprint with area indicated.
Color scheme is ____________________________
Name ________________________________
Street ________________________________
City ________________________________
State ________________________________

MATAWAN CERAMICS
OFTEN AN ECONOMY

Our engineers are especially keen in pointing out the way to economy in the use of marble for exteriors. Often their suggestions as to jointing and bonding make it possible for you to use Georgia Marble at a cost not appreciably greater than that of a commoner material. And in addition to this—Georgia Marble in itself is a decoration which requires no costly enrichment to obtain a striking and beautiful effect.

Lorain Street Branch of the GUARDIAN TRUST COMPANY, Cleveland, O., Rowland Johnson, Arch., Geo. L. Craig, Inc., Contr. The facade is Georgia Merzotint Marble with Georgia Creole Marble base and trim. The white metal used in the large openings of the bank proper, contrasts beautifully with the bold veining in the Creole Marble trim.
M. H. Hoyt and B. Hoyt, Architects, selected HEINZ OLD WORLD TILES for their Tudor English design. Donald M. Bromfield residence, Denver.

THE HEINZ ROOFING TILE CO.
DENVER, COLORADO  3659 COUNCIL ST., LOS ANGELES, CALIF.  101 PARK AVE., NEW YORK
ARCHITECTURAL DESIGN

Part One

ARCHITECTURAL AND ALLIED ARTS EXPOSITION

UNDER THE AUSPICES OF

THE AMERICAN INSTITUTE OF ARCHITECTS
THE ARCHITECTURAL LEAGUE OF NEW YORK

WITH THE ENDORSEMENT OF

THE SOCIETY OF BEAUX-ARTS ARCHITECTS
THE NEW YORK BUILDING CONGRESS

APRIL 18—APRIL 25, 1931

GRAND CENTRAL PALACE, NEW YORK

SPECIAL EXPOSITION COMMITTEE
RAYMOND M. HOOD
FREDERICK G. FROST
JULIAN CLARENCE LEVI

SPECIAL COMMITTEE OF THE ARCHITECTURAL LEAGUE
ELY JACQUES KAHN, Chairman

GENERAL EXPOSITION COMMITTEE

WILLIAM W. ADAMS DELANO

EXECUTIVE OFFICE
105 WEST 40TH STREET
PHONE PENN 1133
MANAGING DIRECTORS
CHARLES H. GREEN
WALTER T. SWEAT

ARCHITECTURAL AND ALLIED ARTS EXPOSITION

UNDER THE AUSPICES OF

THE AMERICAN INSTITUTE OF ARCHITECTS
THE ARCHITECTURAL LEAGUE OF NEW YORK

ANNOUNCEMENT

The Fourth Biennial Architectural and Allied Arts Exposition will mark an important epoch in architectural history as it will commemorate the Fiftieth Anniversary of the founding of the Architectural League of New York. Fifty years of service - during which time American architecture has had its greatest development.

This exposition will be a comprehensive presentation of Architecture, Sculpture, Arts and Crafts, Decorative Material, Building Materials, Utilities and Equipment and will command the attention of representative architects of America and the leading minds of the building world at a time given over to the study of what is progressive and worthy in modern building.

Your participation as an exhibitor is invited. If you will indicate your interest by letter or telephone, we will be pleased to forward our official prospectus and needed information.

President
The Architectural League of New York

FIFTIETH ANNIVERSARY
1881 THE ARCHITECTURAL LEAGUE OF NEW YORK 1931
FIFTY YEARS OF SERVICE
TWO OF A KIND

in NAME

and

WINDOW SHADES

The Daily News Buildings in both New York and Chicago are equipped with washable Tontine window shades.

You might call it a coincidence that both the Daily News Buildings in New York and Chicago have du Pont Tontine window shades. You might—if it were not for the fact that Tontine shades are being specified for so many of the new buildings in every field; office, hotel, school, hospital.

Once you have had experience with these window shades, the reasons for their universal acceptance are obvious. First and foremost, Tontine shades are washable. They can be scrubbed clean with soap and water over and over again. Scrubbing instantly restores their original newness and beauty.

Then, too, Tontine shades do not fade, pinhole or fray. Sunlight does not harm them. Rain does not harm them. They are wear-defying, and beautiful, too.

If you will take a moment to fill in the coupon, we shall be glad to send you further information and samples of these new and improved du Pont Tontine window shades.

E. I. DU PONT DE NEMOURS & CO., INC., NEWBURGH, N. Y.

Canadian subscribers address: Canadian Industries, Limited,

Fabrikoid Division, New Toronto, Ontario, Canada.

E. I. du Pont de Nemours & Co., Inc.,
Desk A.F.12, Newburgh, N. Y.

Please send me complete information about Tontine, the washable window shade.

Name  ........................................
Address  ......................................
A NEW HARMONY

Allegheny Metal alternates with Dark Blue Glass

(Above) A STRIKING EFFECT is secured by the elevator doors opening on the lobby—each a flat sheet of Allegheny Metal free from any projecting surface. Display window frames are formed of this alloy.

IT'S EASY TO CLEAN the doors and entrance door frames from the lobby to the stores—for they're of Allegheny Metal.

EVER BRILLIANT Allegheny Metal... dark blue glass... Allegheny Metal... glass—on down the lobby, each in bands 16 inches wide by 14 feet high. Both are held in place by strips of Allegheny Metal an inch wide.

method of cleaning keeps the La Salle-Wacker Building lobby bright and neat

IT'S a striking effect... quite modern... that you see here in the silvery bright strips of Allegheny Metal, set off by contrasting glass. You see the sparkle of a thousand reflections—tastefully held in check by the sober sheen of glass as dark as night. The lobby's alive—every inch.

And the effect is as permanent as time itself—thanks to Allegheny Metal... to its unrusting, unstaining, untarnishing qualities. Even sulphurous smoke from nearby trains leaves this alloy bright.

This lobby costs slightly less than the customary marble walls. Yet it has a lustre and a freshness that marble seldom gives without continuous and costly attention.

But—what attention does Allegheny Metal need? Very little. Because it withstands every kind of corrosion it meets. It does become soiled through contact—just like the glass beside it. Then it is cleaned as easily as the glass... the metal is bright.

Where else to use this alloy

Not alone in lobby decoration—but in dozens of other uses—is Allegheny Metal preferred. For many-storied pilasters on the Empire State Building, New York City. For elevator cabs in the Mariner Tower, Milwaukee. For all kinds of kitchen and laundry equipment.

It's not an all-purpose metal, but it does have a thousand uses. Many of these affect the architect... many appeal to his clients. It would be worth your while to write, inquiring how Allegheny Metal fits into your plans.

ALLEGHENY STEEL COMPANY
Brackenridge, Pa. ... Offices: New York, Buffalo, Chicago, Cleveland, Detroit, St. Louis, Milwaukee, Los Angeles. Warehouse Stocks: Joseph T. Ryerson & Son, Inc.—Chicago, Cleveland, Milwaukee, St. Louis, Cincinnati, Detroit, Buffalo, Boston, Jersey City, Philadelphia. In Canada: Samuel & Benjamin, Ltd. Toronto.

ALLEGHENY METAL
Licensed by the Chemical Foundation, Inc., under basic patents No. 1,316,817 and No. 1,339,378
The Beauty of CABINET IMPERIAL is exceeded only by its PRACTICALNESS

Practicalness, Appearance, Price—those are the checking points for movable partitions. Test Cabinet Imperial against them.

The excellence of Cabinet Imperial line and design—in solid American Walnut or mahogany—is apparent.

Construction is simplified. Cabinet Imperial is erected in less time—with less work. Sections fit more accurately. Re-installation is simple. Wiring provision is superior. A new type of base gives better appearance, and freedom from mop damage.

Handsome enough for the executive sanctum—the price permits its use everywhere. Wide acceptance shows that Cabinet Imperial checks successfully with the three points—Practicalness, Appearance and Price.

Write for file of details to: Circle A Products Corporation, 650 South 25th Street, Newcastle, Indiana. New York Office, 475 Fifth Avenue.
No single book can present a type of architecture adequately, owing to the author's limitations, and it is desirable to have a comprehensive knowledge of any type of architecture in which we are interested. Those who are interested in old English domestic architecture will find Mr. Hunter's work a valuable contribution to extending the coverage of preceding publications on the subject. This work has been confined to the less pretentious work, principally that found in the small towns and adjoining countryside, in the eastern and southern counties. While the buildings illustrated are not, perhaps, outstanding examples such as the better known manor houses, they do add to the sum of the type and broaden our conception of it.

There is one important lesson to be learned from the study of this book which American architects too often neglect. It is apparent that these English builders, possibly from lack of funds, utilized the building materials at hand, and they were imported from other parts of the country only when necessary. The delight of these old houses and buildings is in their honest indigeneity,—nothing imported or adapted,—simply a growth of the soil. Hence we have stone, brick, wood, stucco finish and all kinds of houses according to the nature of the part of the country in which they were located. Aside from the enjoyable inherent delight of these old houses, the lesson of indigeneity is, perhaps, the most important to be learned from studying this work. It is to be hoped that it will induce our architects to be as consistent as were these old builders. We know instinctively that they are English houses; can we say as much for the American house as a unit, except for its badness?

Mr. Hunter has not included plans because, obviously, these old plans would be utterly unsuited for our needs. We can, however, gain much from the study of the sizes, shapes and proportions of the fine old structures. Such qualities are universal in their application.

The work is divided into five divisions,—cottages illustrated by 53 plate pages; farmhouses and their dependencies, 10 plate pages; small town houses, 22 plate pages; inns, shops and details, 29 plate pages. It is a comprehensive presentation, and Mr. Hunter's photographs, being those of an architect, have captured the most characteristic features of the buildings. The engraver and printer have reproduced these photographs with great skill, and we have illustrations that want nothing in clarity and tone. The effect of this work is stimulating to the imagination and should lead our architects to study more carefully the locale of their work and evolve buildings that are suitable, and not build English houses in America, New England Colonial in Ohio, nor California Mission in Iowa. We can learn much of good taste and fitness from Mr. Hunter's work.

One who follows the publications having to do with architecture, building and decoration can hardly fail to note the success with which American architects adapt for American use the most characteristic qualities of the architecture of many European countries. There is much in the domestic architecture of France, Spain, Italy and other countries of western Europe to serve as models or to afford inspiration, but probably there is more for us to learn from a study of English architecture as it has been developed during the different periods. Much of the most valuable English domestic architecture is to be found in buildings of modest size,—not the vast country palaces built in great numbers during several centuries.

AFTER the array of volumes that have appeared during the last few years on interior architecture, with long texts and all too few illustrations, almost exclusively in black and white, it is most welcome to come upon a work devoted to color reproductions. Such a volume is "Historic Interiors." But it is much more than a mere picture book. The selection of material is extremely fortunate, offering a fairly comprehensive survey of periods when the extensive use of color became an important part of composition as expressed through the applied arts. The plates cover the period of the Baroque through the neo-Classic as exemplified in the residences of both the secular and ecclesiastical princes of Bavaria, Franconia and southern Germany. Since the emphasis of this volume is so largely upon German interiors, it must be counted unfortunate that there are included no examples from Frederick the Great's summer palace of Sans Souci, certainly one of the most perfect architectural monuments of eighteenth century Germany. However, we must be wholeheartedly grateful for the richness of material that is here presented.

The color reproduction of the original oils and watercolors of various modern artists is extremely good. These paintings are subjective impressions, it is true, but they suggest vividly something of the perennial freshness and charm of the original interiors themselves.

In this work, German Baroque and Rococo, generally considered as the step-children of Italy and France, are lifted out of obscurity and offered as things in themselves both interesting and delightful. The preponderance of German examples accentuates the fact, sometimes overlooked, that countries other than France produced furniture and interiors of striking beauty and perfect taste during these periods. This work also helps to bring out the fact that perhaps the greatest strength of the eighteenth century's domestic arts lay in the internationalism of their exponents, a characteristic which may or may not be about to find a parallel in the modernist movement which is just beginning. In these examples collected by Mr. Feulner (who, incidentally, is the director of the Residence Museum in Munich), we are again confronted with the fascination of taste in its manifold expression regardless of frontiers. To consider only one example, there are two illustrations of the prince-bishop's castle at Wurzburg. Here we see the results of a fortunate cooperation of Italian artists with a German architect. Balthasar Neumann, who designed the palace, brought from Italy Antonio Bossi for the plaster reliefs, and from Venice no less celebrated an artist than Tiepolo for the frescoes. The result, as anyone who has had the good fortune to visit the palace knows, is not only impressive, but entirely harmonious. At about the same time, Riesener, a German, was accredited one of the most perfect architectural monu-

ments of eighteenth century Germany. However, we must be wholeheartedly grateful for the richness of material that is here presented.

The color reproduction of the original oils and watercolors of various modern artists is extremely good. These paintings are subjective impressions, it is true, but they suggest vividly something of the perennial freshness and charm of the original interiors themselves.

In this work, German Baroque and Rococo, generally considered as the step-children of Italy and France, are lifted out of obscurity and offered as things in themselves both interesting and delightful. The preponderance of German examples accentuates the fact, sometimes overlooked, that countries other than France produced furniture and interiors of striking beauty and perfect taste during these periods. This work also helps to bring out the fact that perhaps the greatest strength of the eighteenth century's domestic arts lay in the internationalism of their exponents, a characteristic which may or may not be about to find a parallel in the modernist movement which is just beginning. In these examples collected by Mr. Feulner (who, incidentally, is the director of the Residence Museum in Munich), we are again confronted with the fascination of taste in its manifold expression regardless of frontiers. To consider only one example, there are two illustrations of the prince-bishop's castle at Wurzburg. Here we see the results of a fortunate cooperation of Italian artists with a German architect. Balthasar Neumann, who designed the palace, brought from Italy Antonio Bossi for the plaster reliefs, and from Venice no less celebrated an artist than Tiepolo for the frescoes. The result, as anyone who has had the good fortune to visit the palace knows, is not only impressive, but entirely harmonious. At about the same time, Riesener, a German, was accredited one of the most perfect architectural monu-

monuments of eighteenth century Germany. However, we must be wholeheartedly grateful for the richness of material that is here presented.
NORTH VESTIBULE IN THE NEBRASKA STATE CAPITOL, LINCOLN, NEBRASKA
BERTRAM G. GOODHUE, Architect
and
BERTRAM G. GOODHUE ASSOCIATES, Continuing Architects

AN ACOUSTIC INSTALLATION
MASONRY VAULED CEILING (SUPPORTING ROOF) WITH ACOUSTIC TILE SOFFIT
AND CERAMIC DECORATION IN FOURTEEN DIFFERENT COLORS AND GOLD

CONSTRUCTED AND MANUFACTURED BY
R. GUASTAVINO COMPANY
40 COURT STREET, BOSTON, MASS. 225 WEST 34th STREET, NEW YORK, N. Y.
R. GUASTAVINO CO. OF CANADA, LTD., New Birks Building, Montreal, P. Q.
WESTERN UNION DIDN'T GUESS
- - - THEY TESTED FLOOR MATERIALS

When Western Union officials decided to erect in New York City the largest central telegraph office in the world they were confronted with a flooring problem of unusual complexity. Operating room floors—with a 24 hour working day—required a material which could withstand extreme wear, absorb a minimum of light and a maximum of sound, at lowest maintenance and repair cost.

The investment involved in this installation (approximately 200,000 square feet) required facts. Guess work was “out,” too much was at stake. So test patches of many materials were laid down, in one of the company’s older buildings. Service tests were conducted over a period of many months. And the result was the selection of Bonded Floors of Sealex Treadlite Tile for Western Union's new building. This material had once again proved its leadership under the most exacting circumstances.

Handsome and practical, colorful and up-to-date, Western Union’s Bonded Floors not only were economical to lay, but held down maintenance costs substantially. And they are backed by a Guaranty Bond!

Write Department J. for details of our nationwide installation service.

CONGOLEUM NAIRN INC., General Office: KEARNY, N.J.

BONDED FLOORS

Bonded Floors are floors of Sealex Linoleum and Sealex Treadlite Tile, backed by a Guaranty Bond. Authorized Contractors of Bonded Floors are located in principal cities.
lies rooms, others that both ante-date and post-date the work of this artist, so that this group of illustrations alone covers practically three centuries in the history of German decoration. But charming and stately as these other rooms are, they do not possess the unity and balance of those at Amalienburg. One of the plates included shows a bedroom in that castle where a design of silver-leaved cascades on an orange-yellow ground gives a lightness and playful delicacy worthy in every detail of the best in eighteenth century tradition.

In pleasant contrast to the stately proportions of the castles just mentioned, we find more intimate views from Bamberg, Ansbach and especially Bayreuth. In the Hermitage of the latter, a room known as the "haunted chamber" bears all the characteristics of Bavarian decoration, repeating the national colors, the mouldings of the white painted furniture being picked out in gold leaf, with insets of blue in the wall panels and with the consoles topped with lapis lazuli. The boldness of the Rococo style is very apparent here and shows decided Venetian influence.

The volume concludes with a small section of bourgeois interiors taken mainly from houses located in the north of Germany. It is interesting to note that besides the usual flower and animal painted decorations, tiles are also extensively used to enrich the walls. Undoubtedly this is the result of Dutch influence.

French interiors are represented by only two plates, one of them showing Mrs. Wharton's charming white salon at St. Brie. It is to be hoped that the editor will be encouraged by the success of this volume to bring out others of the same character. There is a distinct gap in this field which could be well filled by volumes presenting French, English and early American interiors.


WHEN a publication has served for 20 years what its editors modestly call a "limited field," the occasion calls for congratulations to those who have directed its fortunes. Such an occasion is the completion of 20 years of service by Landscape Architecture, and a Compiled Index of Volumes I to XX, from October, 1910, to July, 1930, sums up in concise form what the quarterly has offered to what is not a limited but indeed a really broad field. A glance at the Index shows that Landscape Architecture has dealt with a range of topics much wider than might be expected of a journal bearing its title. Landscape architecture touches at many points the fields of architecture proper; town and city planning; many phases of educational effort; horticulture and forestry; painting; sculpture; real estate development, and professional practice. In fact it would be difficult to name a field allied either directly or indirectly with landscape architecture which has not been dealt with from time to time by this excellent journal. Architects and the architectural press may well offer congratulations, and express the hope that Landscape Architecture will continue to flourish and live to observe many more anniversaries and serve so acceptably its interesting field.

Give Books for Xmas!

American Airport Designs

This book presents 44 of the best airport plans submitted in the recent Lehigh Airports Competition. The prize winning designs and a group of others are presented in 73 full page plates.

A section is devoted to the first four prize winning designs with descriptive text and eight full page plates of plans and perspectives. A multitude of practical suggestions are to be found in these pre­\n

mature plans. These are followed by the twelve honorable mention designs in 24 full page plates with descriptive text. Then there is a group of 28 designs chosen for the interesting and ingenious ideas which distinguish them. Every design offers at least one new and practical suggestion nor found elsewhere.

A critical analysis of the designs by Archibald Black, is one of the most valuable features of the book. It interprets the various ele­\n

ments of the designs, pointing out those features of greatest merit and practical worth, and criticizing such elements as do not conform to modern aeronautic practice. This section, studied in conjunction with the 44 designs, constitutes almost a manual of practice in air­\n

port planning.

73 full page plates, 7 x 10 inches, cloth. Price $3.00. Acoustics

By Stewart and Lindsay

This book presents acoustics from a brand new point of view, and applies new mathematical methods to principles of classical acoustics to enable you to solve problems easily and effectively.

The Architectural Acoustics section owes its great appeal to the features that mark the other sections of this book—practical applications and the valuable, newly-discovered data. The practical applications in this case include the determination of the optimum reverberation time in a large room or hall, sound-absorbing materials, the acoustic adjustment of rooms, transmission through walls and doors (sound-proofing), with a special treatment of the prevention of machinery noises. A particularly new development is the work of Eyring, et al., on reverberation in "dead" rooms. This is of the utmost importance in connection with the recording of talking mov­\n

ing pictures.


pheric Acoustics. Appendices.

368 pages, 6 x 9 inches, illustrated, cloth. Price $5.00.

Hotel Planning and Outfitting

By Taylor and Bliss

A COMPREHENSIVE guide to the best practice in planning, designing, equipping, decorating and furnishing the modern hotel. All the different types are covered—the Commercial Hotel, the Residential or Apartment Hotel, the Resort Hotel, and the Bachelor Hotel. Views of hotels in different parts of the country; their exteriors and interiors, and in many instances their plans are included and fully analyzed. The chapters on furnishing and equip­\n

ping constitutes the final word on this important subject. There are collections of hotel restaurants, cafeterias, kitchens, pantries, "serving pantries," refrigerating plants and all the departments which are neces­\n

sary in a modern hotel of any type.

438 pages, 8½ x 11½ inches, 300 figures, cloth. Price $10.00.

Majorcan Houses and Gardens

By Byne and Stapley

BEGINNING with Catalan Gothic as their prototype, Majorcan houses were later subject to Italian influence, principally Geno­\n

e, but in time they came to constitute a distinct Mediterranean type just a bit different from anything in Italy or Spain. The capital, Palma, contains numerous important palaces of the XVI and XVII Centuries, the towns Soller, Inca and Manacor have dignified stone houses less urban in character, but the houses which most appeal are the country seats—that combination of villa and farmstead scat­\n

tered over the Island. All are beautifully illustrated with details, floor plans, etc., in this new book.

188 full page plates, 11 x 16 inches, over 300 figures, cloth. Price $25.00.

The Brick Church and Parish House

A COLLECTION of prize winning designs with exterior and in­\n

terior views, elevations and details of over 65 churches. These range from the small country church to the large city one. All denominations and architectural styles are included.

80 pages, 10½ x 13½ inches, heavy linenette. Price $5.00.

Sent Prepaid on Receipt of Price.

Architectural Forum, 521 Fifth Avenue, New York
Give Books for Xmas!

American Commercial Buildings of Today  
By R. W. Sexton

The latest developments in the design of commercial buildings in this country are given in this new work. The illustrations are divided into four groups: Skyscraper Office Buildings; Private Business Buildings; Stores and Shops, and Banks—Interiors and Exteriors. Each group is preceded by an article in which the problems of design are described and suggestions made to aid their logical solution.

There are over three hundred pages of photographs of exteriors and interiors, details, plans, scale drawings, and sketches. The buildings illustrated are modern in that they are of recent conception and may be said to be characteristic of today.

324 pages, 9½ x 12½ inches, over 300 full page plates, cloth. Price $18.00.

American Apartment Houses, Hotels, Apartment Hotels of Today  
By R. W. Sexton

PROBABLY at no time in the history of the world has the style of architecture in a country changed so radically during such a short period of time as it has in the United States during the past decade. This is particularly true of the plan of the multi-family dwelling—the apartment houses, hotels, apartment hotels. Just two years ago, Mr. Sexton prepared a book entitled "American Apartment Houses of Today." This book recorded the progress that had been made up to that time in the development of a type of building which had been evolved to relieve the perplexing housing problem with which the larger cities were confronted.

This companion volume depicts an entirely new collection of apartment houses. Included in this second volume is a collection of hotels and apartment hotels gathered from all parts of the country. Every building is illustrated by exterior views and typical floor plans. There is also included an assortment of photographs of interiors in these several types of multi-dwellings.

There are plans of over one hundred and fifty apartment houses, fifty hotels, fifty apartment hotels and fifty pages of interiors.

328 pages, 10 x 13 inches, over 600 figures, cloth. Price $18.00.

American Country Houses of Today—1930  
By Sexton and Holden

EVERY architect will welcome this new collection of 100 charming examples of the work of fifty of the leading designers of residences. They include the latest developments in house work in all the architectural styles and as built in all sections of the country. Photographic and floor plans of every house are given with numerous interior views.

210 pages, 9½ x 12½ inches, 250 figures, cloth. Price $12.50.

Italian Rural Architecture  
By G. Ferrari

THIS interesting book will be of great assistance in the designing of this type of building in our country. The scope of the volume is from the Northern Provinces of Italy down to Calabria and the examples have been selected by an Italian Architect who has given the utmost care and attention to the material he has gathered.

It contains upwards of 250 plates of which 27 are in color, comprising 75 drawings and the balance are heliographic reproductions.

282 pages, 9 x 12 inches, 250 plates, cloth. Price $13.50.

Parish Churches of England  
By C. H. Walker

THIS volume contains an interesting collection of photographs all clearly printed on coated paper, 29 of the most interesting small churches are illustrated. They are selected from all sections of the country, all periods of English architecture are presented. In the introductory text the author has given some very interesting facts regarding the various churches.

42 pages, 8½ x 10½ inches, cloth. Price $1.00.

Modern Danish Architecture  
By Fisker and Yerbury

PHOTOGRAPHS and plans of work done within the last fifteen years by thirty selected architects.

100 full page plates, 9 x 11¾ inches, cloth. Price $10.00.

Sent Prepaid on Receipt of Price.

Architectural Forum, 521 Fifth Avenue, New York

ACCOUNTING FOR DEPRECIATION OF SCHOOL BUILDINGS  

DEPRECIATION of publicly-owned buildings is seldom considered either by the public or the responsible officials. Usually, in estimating the cost of instruction per pupil, the depreciation of the buildings used for purposes of instruction is not included. Depreciation is an unavoidable actuality, and sound, scientific accounting must give cognizance to it. The idea that depreciation is applicable to publicly-owned buildings is so new that one reads this study with interest, and it should be seriously considered by all school officials and by architects who specialize in the designing of schoolhouses.

TECHNO—DICTIONARY. By Hubert Hermans. Second Edition. 42 pages, 8½ x 10¾ inches, paper. Price $3.75. Hubert Hermans, Duhlemmer Strasse 64, Berlin-Lichterfelde (West), Germany. To be ordered directly from publisher.

A POCKET size dictionary of technical words in German-English, Italian-English, and Italian-German-English. This revised, second edition has been considerably enlarged by the addition of terms not included in the previous edition. The terms were collected principally from technical publications printed in the German, English and Italian languages. It is not a dictionary in the usual sense of giving the meanings of words, as it is assumed that the user knows the meaning in his own language. It does, however, give the word of the same meaning in either of the other two languages. It is intended to assist the engineer and business man reading periodicals and books in foreign languages.


HOT water service, to be satisfactory, must be both adequate in supply and economical in fuel consumption. The first consideration is to plan for an adequate supply, which involves the capacity of the heating boiler and the size and arrangement of the water supply pipes. For a given volume of hot water required, the sizes of pipes can be determined. The volume of water requirements depends on the kind of occupancy to be served. All of these factors must be known before the selection is made of the type of boiler and before the kind of fuel is determined. The kind of fuel used is a purely economic matter, varying with different local conditions.

In this work the hot water requirements for domestic and many kinds of commercial uses are given for estimating the total, peak-load consumption. Equally comprehensive data are given for the designing of the supply and circulating system. The heating boilers, hot water accessories, and the various types of boilers are described. Hereetofore, working data for designing hot water systems have been widely scattered and sometimes of questionable authenticity. The American Gas Association has expended a large sum of money and much effort to assemble authentic data pertaining to the subject of hot water heating, uses and distribution. These data have been carefully edited, and the result is the most complete presentation of the subject available. Regardless of the kind of fuel used for heating water, this book is of value to architects and to engineers in planning.
How to
SAVE MONEY
on window shades

To save money on window shades, look for service—and look out for upkeep! True value in window shades is cost divided by length of good service.

A Columbia shade may differ but little from other shades in cost and appearance when new. Yet the Columbia shade will save you money...a great deal of it sometimes. It will be a better shade for a longer time. It will spread its first cost into a surprising minimum per month—or year—of usefulness.

Columbia shades are built for long and active service—by the largest makers in the world. There is a Columbia shading for every use. Each is demonstrably the best of its kind. And Columbia rollers—strong sprung, with a constant reserve of power, ingeniously designed for quietness and ease of operation, staunchly built—are without equal for efficiency and length of service.

To save money on window shades, see that yours are Columbia. You will be saving money all the while you use them. And that will be a long, long time.
This doorway of cast **BRONZE**

**THE FIDELITY-PHILADELPHIA TRUST BUILDING**

The doorways of the three entrances again show how faithfully bronze can represent the architect's and sculptor's creation. The bronze doorways are rich in sculptural detail—yet the total effect is architecturally harmonious. The doors are modeled in low relief and finished in medium statuary patine. The entrance screen above the doorways is ornamental bronze and imported cathedral glass—specially treated to subdue light. The leading is repoussed and gold leafed. The colonettes, cheneaux, and lanterns are also cast in bronze and modeled in low relief.

Architects . . . . . Simon & Simon
Sculptors . . . . . Piccirilli Bros.
Contractors . . . . Irwin & Leighton

Above is shown a detail from the bronze doorway. In 24 panels is depicted an allegory of the evolution of civilization and commerce.
THE EDITORS' FORUM

COMPETITIONS FOR THE PRIZES OF ROME

The American Academy in Rome has announced its annual competition for fellowships in architecture, landscape architecture, painting and sculpture. In architecture the Katharine Edwards Gordon fellowship is to be awarded; in landscape architecture the Kate Lancaster Brewster fellowship; in painting the Jacob H. Lazarus fellowship, provided by the Metropolitan Museum of Art; and in sculpture the Parrish Art Museum fellowship.

The competitions are open to unmarried men not over 30 years of age who are citizens of the United States. The stipend of each fellowship is $1,500 a year with an allowance of from $150 to $300 for materials and incidental expenses. Residence and studio are provided at the Academy, and the total estimated value of each fellowship is about $2,500 a year.

The term of each fellowship is three years. Fellows have opportunity for extensive travel and for making contacts with leading European artists and scholars. The Grand Central Art Galleries, of New York, will present free membership in the Galleries to the painter and sculptor who win the Rome Prizes and fulfill the obligations of the fellowships.

Entries for competitions will be received until February 1. Circulars of information and application blanks may be obtained by addressing Roscoe Guernsey, Executive Secretary, American Academy in Rome, 101 Park Avenue, New York, in charge of the competitions.

LECTURES FOR DRAFTSMEN

A NEW activity of the New York Society of Architects is the formation of an auxiliary organization intended to be of benefit to draftsmen and junior architects who are not as yet registered as architects. The immediate objective of this organization, which is intended to be partly educational and partly social, consists of the giving of a course of lectures to be delivered during the coming winter and spring. The subjects of the lectures are:

The Education of an Architect.

The Functions of an Architect and his Relations to the Client.

Modern Tendencies in Design.

Methods of Studying a Project, Beginning with the Sketches.

Taking of Estimates and General Practice of Letting Contracts.

Supervision of Work in Field.

Technique of Writing Specifications.

Office Administration, Organization and Cost of Producing Drawings.

Selection of Building Materials.

Legal Standpoint of the Profession.

Louis E. Jallade is in charge of the series, and he has enlisted the service of a number of well known New York architects to deliver the lectures, the first of which will be given December 16 at the Murray Hill Hotel. Those desiring tickets of admission may address Mr. Jallade at his office, 15 East 47th Street, New York.

A TRAVELING EXHIBITION

On October 15, The American Federation of Arts opened its Third International Industrial Exhibition at the Museum of Fine Arts, Boston. The Exhibition will open in New York in December, and later in Chicago and Cleveland. “It will be recalled that in line with the policy of the American Federation of Art to demonstrate design in current production and to bring American products into comparison with those of Europe, the General Education Board, in May, 1927, granted to the Federation $25,000 annually for a period of three years, to be applied toward assembling and circulating among museums of art a series of international collections of the products of today in various industrial art fields.

“In accord with the decision to limit the scope of these Exhibitions, the first in the series covered the ceramic arts; the second, which is still on tour, included decorative glass and rugs; while the third embraces only metals and cotton fabrics. These broad fields had to be narrowed down to more feasible working limits, so that in the metals it was found necessary to exclude jewelry and sculpture, and likewise the larger architectural pieces intended to be attached to buildings. In the cotton fields are included only woven and printed upholstery and drapery fabrics, made entirely of cotton or containing a very slight admixture of other fibers, provided that the design is carried out by the cotton itself. Dress materials are not included.

“There will be shown in this third Exhibition, in addition to the American entries, the work of eight foreign countries: Czechoslovakia, Denmark, England, France, Germany, the Netherlands, Sweden and Switzerland. About 939 objects, produced by some 181 firms and draftsmen involving the work of nearly 275 designers, have been included. In view of the attendance of over 160,000 persons for the first two Exhibition circuits, the Federation anticipates an equally warm reception for the third industrial art collection being sponsored by the American Federation of Arts.”

A CORRECTION

Referring to the First Presbyterian Church, Greensboro, N. C., published in the October issue of The Forum, equal credit should have been given Hobart Upjohn, New York, and Harry Barton, Greensboro, N. C., as the architects of the building.
Corbin designs you will find modern in their motifs but old-fashioned in their quality

Good Buildings Deserve Good Hardware

Photographed are (left to right)
"Vertex" door handle, "Gargon" knob and escutcheon, "Vertex" knob and escutcheon and
"Gotham" knob and escutcheon.

P. & F. CORBIN
Since 1849
NEW BRITAIN, CONN.
U. S. A.
The American Hardware Corp.,
Successor
New York Chicago
Philadelphia
PART ONE—ARCHITECTURAL DESIGN

Cover Design: The Terminal
  From a Water Color by Roland A. Wank
  Page 35

ARTICLES

Modern Railway Passenger Terminals
  Alfred Felkheimer 655

The Design of Small Railway Stations
  Gilbert Stanley Underwood 695

Planning for Airport Buildings
  Roger W. Sherman 705

Bus Terminal Planning
  John C. Fisteré 745

PLATE ILLUSTRATIONS

Central Passenger Station, Buffalo
  Fellheimer & Wagner 663-666

Study for Railway Station, Philadelphia
  Fellheimer & Wagner 667-668

Central Railroad Station, Viborg, Finland
  Graham, Anderson, Probst & White 669-672

Passenger Station, Helsinki, Finland
  Eiel Saarinen 673-675

Passenger Station, Konigsberg
  Ernest Richter 677, 678

Passenger Station, Stuttgart
  Paul Bonatz, F. E. Scholer 679, 680

Grand Central Terminal, Glenlake, Cal.
  H. L. Godfrey 713-716

United Airport, Burbank, Cal.
  The Austin Company 717-720

Curtiss-Wright Hangar, Los Angeles
  Gable & Wyant 721, 722

Curtiss-Reynolds Airport, Chicago
  Rehor & Wentworth 723, 724

Wayne County Airport, Wayne County, Mich.
  City Engineering Dept. 725, 726

Terminal Building, Miami, Fla.
  Delano & Aldrich 731, 732

Municipal Airport, Chattanooga, Tenn.
  William Crutchfield 733, 734

Washington Airport, Washington, D. C.
  Holden, Scott & Hutchinson 735, 736

Tempelhof Airport, Berlin
  Paul and Klaus Engler 737, 738

A Proposed Air Terminal
  Felkheimer & Wagner 739, 740

Interurban Central Bus Station, Kansas City
  Wight & Wight 741, 742

B. & O. Motor Coach Station, New York
  Sloan & Robertson 743, 744

PART TWO—ARCHITECTURAL ENGINEERING AND BUSINESS

Rails and Rising Towers
  From a Charcoal Drawing by Tabu
  Frontispiece

ARTICLES

Railroad Station Materials and Maintenance
  John C. Fisteré 751

Railroad Buildings for Operation, Service and Commerce
  A. T. North 759

Airplane Hangars
  Roger W. Sherman 769

Policy and Opinion
  John C. Fisteré 781

Bus Terminal Construction

KENNETH K. STOWELL, A.I.A., EDITOR
ARTHUR T. NORTH, A.I.A.
ROGER W. SHERMAN
JOHN C. FISTERE

CONTRIBUTING EDITORS

Harvey Wiley Corbett
Kenneth M. Marchison
Rexford Newcomb
Alexander B. Thowbridge
Aymar Embury II
Charles G. Loring
C. Stanley Taylor

LESTER R. FOUNTAIN, ADVERTISING MANAGER

GORDON G. JONES, PRODUCTION MANAGER

THE ARCHITECTURAL FORUM is published monthly by National Trade Journals, Inc., 531 Fifth Avenue, New York, N. Y. Present subscription: $7.00. Single copies; regular issues, $1.00; special issues, $3.00. Second class postage paid at New York, N. Y. Address all communications to 531 Fifth Avenue, New York, N. Y. Copyright, 1930, by National Trade Journals, Inc.
Cabinet Work by Telesco

in this important Park Avenue Branch
of the Irving Trust Company


A PAINTER, it is said, must be an able classicist before he can excel as a modernist. A poet must major in metre'd verse, before he essays the medium of vers libre.

So too a manufacturer must be first an accomplished cabinet maker before he can make partition of distinction. The reputation of Henry Klein & Co., Inc., as makers of Telesco Partition, is based on their ability as cabinet makers.

This ability is especially noted in bank equipment installed by Henry Klein & Co., Inc. A fine example, illustrated above, is the important branch of the Irving Trust Company, in the Grand Central Building, N. Y.

In the fidelity with which the architect's design is executed, in the adaptability of counter units to the needs of the bank, Henry Klein & Co., Inc., is an important ally to the architect.

Our display store is used by many architects, with their clients, to select bank equipment, partition and paneling. Or we shall be glad to send, on request, photographs of typical installations of the kind of work in which you are interested.

HENRY KLEIN & CO., INC.
(Established 1909)
40-46 West 23rd St. New York
Factory: Elmhurst, N. Y.
Branches and representatives in principal cities.

TELESCO
PARTITION
REG. U. S. PAT. OFF.
CLEVELAND UNION TERMINAL
GRAHAM, ANDERSON, PROBST & WHITE
ARCHITECTS
MOST architects in ordinary practice, when retained to design a structure of commercial, industrial or residential character in urban territory, are usually confronted by surroundings and conditions which are comparatively simple and predetermined in character. Given the plot plan, street levels, photographs of contiguous properties, the building code and the client’s instructions, he may concentrate at once upon the problem of bringing all the controlling elements into a harmonious and effective design.

On the other hand, the architect, when retained to design a modern passenger terminal, quickly finds that the problem is not so simple. In many cases nothing seems to be determined. In some, even the matter of site is still open or must be revised. The city plan, if any, must be followed, or, if necessary, brought into harmony with the project in hand. If no city plan exists, tentative studies therefor must be made. Coordination with transit, street car, bus and other traffic is to be considered. Study for the elimination of grade crossings may be a condition precedent to the station design. The railroad operating features, present and future, are subject to exhaustive study, particularly where more than one railroad is involved. The general scope of the work and the approximate sizes of the principal facilities must be assumed and a balance struck between the cost of the project and the funds available or to be provided,—and all this before the architectural portion of the problem can be attempted.

As propaganda in the public press may be needful; as action by public bodies may be necessary; as a number of railroad organizations, including the boards of directors, may have to be brought into agreement; and as all these may be adversely affected by matters of political or financial import, it is not difficult to understand why many years may elapse between the inception and completion of any considerable project. The Grand Central Terminal, New York, was under way for upwards of 25 years. The Central Station in Buffalo is the result of 20 years or more of effort. The St. Paul Union Depot, after the preparation of over 100 schemes and the lapse of 15 years, became a reality. The Cincinnati Union Terminal now under construction will be the result of upwards of 20 years of agitation, discussion, reports and planning. The rehabilitation of the Chicago South Side Terminals has been in prospect for over 15 years, and no comprehensive and definite scheme has yet been found acceptable. And so on by the score. Should any terminal project be conceived, planned and executed within the period of time devoted to any of the present-day outstanding commercial buildings, such as the Chanin, Lincoln, Chrysler, Salmon, Empire State and many others, it would be the exception and not the rule. It may therefore be said that those who have been prominently connected with the design of notable passenger terminals have literally grown up with them through the era of their development.

But it occasionally happens that an architect in general practice has, or has had thrust upon him, the opportunity or necessity of going through with such a problem, and some outline of the procedure involved may be welcome and helpful. What follows is a brief outline of matters to be considered in evolving an acceptable terminal plan.
DESIGN USED AT ANOTHER TERMINAL

NOT ACCEPTABLE

In addition to the obvious railroad necessities, the designer is usually confronted with numerous other important conditions such as the economic soundness of the project, and civic and other requirements both present and future. Each problem therefore presents some controlling features peculiar to itself, and a plan though successfully carried out elsewhere cannot be acceptably reproduced. The designer must therefore rely on his vision, ingenuity and skill in devising a plan which will satisfy all the requirements, with due regard to their relative importance, thereby creating an acceptable design, so that when the details have been correctly developed, a vitalized, successful plan will result. It is also always to be remembered that a modern large passenger terminal represents perhaps the greatest expenditure a railroad makes for an individual improvement, and that the degree of skill with which it is planned, to a great extent, predetermines its future as an asset or liability to the railroad.

CREATION OF THE BASIC SCHEME

The terminal in its broadest sense should provide adequate and efficient means for the handling of the railroad traffic: permit the full development of revenue from the by-products, such as rentable space and utilization of air rights; assist in the accomplishment of the city plan; and render public service in the largest measure.

Certain tendencies such as (1) Electrification, (2) Segregation of Suburban, Mail and Express Traffic, (3) Consolidation of Terminals, and (4) Coordination with City Plan, are some of the controlling elements affecting terminal station design.

(1) Electrification of terminal zones is gradually taking place. In general its advantages from a strictly operating standpoint are not ordinarily sufficient to justify the scrapping of existing plant and equipment in its favor. If, however, the terminal is so located that it is or may be potentially desirable for intensive commercial building development of its air rights, electrification may be definitely considered. In any event, if there is any prospect of electrification within the life of the terminal, nothing should be done that would preclude its installation when the future justifies it. If electrification is definitely contemplated, advantage can be taken of it in the immediate development of air rights and in the use of such track grades as will open up possibilities of design not practical as long as steam operation during the early life of the terminal is a necessity. Characteristic developments of air rights are found at the Grand Central Terminal, New York; the Union Station, Cleveland; and, to an extent limited by steam operation, near the Union Station, Chicago.

(2) Segregation of Suburban, Mail and Express Traffic. Where the volume and growth of the suburban business tends to interfere seriously with the use of the terminal for its primary purpose,—the through or long distance traffic,—and where there is an adequate rapid transit system developed or likely to be developed in the terminal city, consideration should always be given to the ultimate segregation and possible diversion of the suburban business to the rapid transit lines at some point outside of the terminal-congested area. Where the mail and express traffic is in car-load volume and handled in solid trains, the possibility of segregating this traffic into separate terminal facilities outside of the passenger terminal should be carefully considered in order that this separation may be accomplished when desirable.

(3) Consolidation of Terminals. Consolidation of railroads, still in the discussion stage, will undoubtedly be accomplished at some indefinite time in the future, inevitably bringing with it combinations of terminals which are now separate units. In any terminal problem thought should be given to this eventuality to avoid if possible serious waste of capital. Electrification may, however, in special cases, permit the development of air rights commercially to such an extent that the separate terminal can still be justified.

(4) Coordination with City Plan. Steps should be taken to secure the fullest coordination of the traffic elements of the terminal station with the city plan. If there is no official city plan, studies should be made so that no obstacle need be placed in the way of the development of any reasonable plan on behalf of the city. Sufficient open space should be acquired, or be available when needed, to give a proper setting for an improvement of such magnitude and importance.

GENERAL REQUIREMENTS

Preliminary examination of the problem must determine that any proposed basic plan will satisfy these requirements:

(1) That the improvement of any proposed site, as compared with other available sites, is desirable on the basis of construction and operating costs, including car unit costs. The car unit costs are particularly important where the area available is so restricted as to require double deck structures to secure the desired capacity.

(2) That suitable development to meet the normal growth for such a period as will justify the project can be made in convenient stages from time to time.

(3) That the project is desirable to the city and in harmony with its city plan.
Study for Lake Front Passenger Terminal, Chicago, Ill. Fellheimer & Wagner, Architects and Engineers

Sub station, waiting room type head house. Streets and main station floor at upper track level. Suburban station floor at lower track level. Trucking access at upper track level. Baggage platform contact, by midway at upper track level and by midway and elevator to lower track level

(4) That the advantages offered to the public are sufficient to justify such concessions as may be required from the municipality.

(5) That the project is economically sound to the extent that it can be readily financed, and that there are no prior financial obligations which cannot easily be discharged.

(6) That the revenue from rental of surplus space and air rights will absorb or substantially reduce the carrying charges for the improvement.

(7) That the project as planned is so sound and free from imposing burdensome conditions on the railroad company, that governmental approval can readily be secured.

(8) That the improvement is of such a type that material commensurate enhancement of land values within the terminal area will necessarily follow.

SPECIFIC REQUIREMENTS

In addition to the foregoing broad principles, the basic scheme must meet these conditions:

Transition from Existing Conditions to Proposed Plan. Except at a new site, the new scheme must fit in with existing conditions to the extent that a gradual transition to the final plan can be effected without serious interference with operation, and in such stages from time to time as will conform to the current growth in traffic and with the development of contiguous property. Obvious economic and practical reasons render this imperative.

Benefits to Both the Public and the Railroad. Not only must there be an increase in comfort and convenience to insure the good will of the public, but there must also be sufficient economy in first cost and operation to insure efficient and liberal service on the part of the railroad.

Simplicity of Plan to Insure Directness. The scheme must be orderly and direct in the placement of its principal parts to avoid disorder and confusion in the use of the facilities.

Coordination of Railroad Facilities and Street Arrangement. The railroad facilities must coordinate with the full development of the streets throughout the terminal area in conformity with the city plan, so as to permit free city expansion along and across the terminal. This will benefit both the railroad company and the city.

Flexibility in Adjustment to Future Development. Possibility of adjustment to meet future developments must be provided for, so that useful life will be limited by physical decay rather than by obsolescence. This is particularly necessary in terminals operated by steam in the early stages.

Adequate Capacity in Approaches, Throats and Yards. The track capacity in approaches, throats and yards must be definitely determined to be adequate and in proper balance, to secure effective and efficient use of the whole terminal.

Possible Types for Track and Station Arrangement. When the general scheme has been found to be in full accord with the preceding requirements a selection of the types of track and station arrangement must be made to fit the conditions imposed by the site and its surroundings and the character of the traffic to be served.

There are these two types of track arrangement from which to choose:

Through Type. Here the track and other facilities provide for the operation of trains in whole or in part through or past the station without reversing the direction of movement. This type is concededly the best for rapid and efficient
handling of trains and, if possible, should be the type selected unless a careful investigation of all other elements fails to show the necessary preponderance in its favor.

**Stub Type.** Here all tracks terminate, and the trains are operated to and from the station by reversing the direction of motion. Some of the special advantages of the through type can be given the stub type by providing for the release of the engine after arrival, or, if there is sufficient room laterally, by the introduction of a loop arrangement.

In this type, except in cases where there is a difference between street and track levels, the platforms and other facilities can be arranged at one level, with these advantages:

1. Highest total efficiency in operation and the greatest convenience to the public.
2. Freer and faster travel on platforms, unencumbered by stairs or ramps.
3. Practical elimination of vertical travel of passengers between streets and platforms.
4. Economy in cost of construction, operation and maintenance.

Wherever possible, the short-haul (suburban) traffic, with its intensive service requirements, should be provided with means for through or continuous train operation.

There are these three types of station or head house arrangement:

1. **Waiting Room Type of Head House.** Here the waiting room is made the focal center of the station, with all dependent facilities, such as ticket office, baggage and check rooms, opening directly therefrom, and with a separate passenger concourse for access to train platforms. The Washington Union Station is an example of this.

2. **Concourse Type of Head House.** Here a large general passenger concourse is provided for the mass circulation of passengers, with ticket office and other dependent facilities opening directly therefrom, the waiting room and its auxiliary facilities being placed adjacent to but separate from the concourse. The Grand Central Terminal, New York, is an example.

3. **Composite Type of Head House.** Here a large room is provided exclusively for the sale of tickets, checking baggage, and like dependencies, with separate waiting rooms and passenger concourse. The Pennsylvania Station, New York, is an example. The above types are influenced by the topography of the site, i.e., the differences in level between the tracks and adjoining streets. This results in these other types:

   - **Single Level.** Here the tracks and streets are at substantially the same elevation. This condition is often of great advantage in a Stub Type, but quite the reverse in a Through Type Station.

   - **Double Level.** Here the tracks are either above or below the street and main station level. This is the best arrangement generally for a modern large passenger terminal; the latter condition, with tracks below the street and station level, is to be preferred on account of less vertical travel for the passenger.

   - **Multi-Level.** Here the station, streets and tracks are at different levels, or there are either two track levels or two street levels, making three
or more levels in all, depending on grades, etc. 

The character of the traffic to be served offers 
for selection these other types: 
Suburban, or Short Distance Type. Here the 
facilities are used exclusively for this class of 
passenger traffic, and in general may be smaller 
and less elaborate.

Through or Long Distance Type. Here the 
main function is the housing of through or long 
distance passengers, and the facilities are usually 
larger and more elaborate. Such a terminal can, 
of course, be used also for suburban traffic up 
to the point where such use begins to interfere 
with the through traffic.

Combined Through and Suburban Type. Here 
the station is definitely designed for both classes 
of traffic, each being more or less segregated from 
the other either on one level or on different levels.

ELABORATION OF THE DESIGN

TRAFFIC CONSIDERATIONS

Extreme Peak Conditions of Traffic do not 
Govern. It is not necessary to provide for 
extreme peak conditions, since any well planned 
station can carry an overload for short periods 
without undue operating stress or inconvenience 
to the public. The design therefore should pro­
vide for the normal, frequently recurring peaks 
of the anticipated traffic.

Foot Traffic Channels, Natural and Direct. 
The general arrangement of facilities should 
invite movement of foot traffic along natural and 
direct channels and avoid as far as possible crossing 
of the main travel routes and the retracing 
of steps. Where established lines of city foot 
traffic are interrupted by the terminal construc­
tion, provision should be made to accommodate such traffic without interference with the normal use of the station.

Separation of Suburban and Through Foot 
Traffic. This should be effectively accomplished 
to avoid confusion and expedite both classes of 
traffic. It is not essential that entirely separate 
concourse, waiting room and general facilities be 
provided. The main channels of circulation 
should, however, be completely segregated.

Separation of Inbound and Outbound Traffic. Although it is desirable to separate the channels of passenger foot traffic and allocate sections of the terminal facilities to inbound and outbound traffic, no physical division should be planned in the track layout that will limit interchangeability in the use of the tracks.

Separate Inbound and Outbound Baggage 
Facilities. The facilities for receiving, delivery 
and storage should be separated. Trucking sub­
ways, bridges and other passageways may be used 
in common.

Vehicular Traffic. Adequate provision should 
be made for the public and private vehicular 
traffic in suitable and close relationship to the 
station facilities.

Local Transit Contact. In addition to access to 
streets, convenient entrances and exits should be 
provided for interchange of passengers with surface 
lines, subways, elevated lines or other local 
transportation systems. It is often feasible to 
have local transit lines on a level directly above 
or below the station track level and in direct contact therewith.

Unnecessary Foot Traffic Diversion to be 
Avoided. Provision should be made for direct 
contact with all natural points of exit and 
entrance. These contacts should not be forced 
out of place by the architectural composition.

Traffic Contact with Mail and Express Facili­
ties. This is provided for by platforms, elevators 
and ramps between the trains and the facilities 
in question. The volume of traffic handled in
this way decreases materially when solid trains and carload lots are provided for outside the main station facilities.

**Segregation of Freight Traffic.** Should the terminal include provision for freight traffic, this portion of the layout should be entirely segregated from the passenger facilities, and as far as possible all freight trucking areas should be exterior to the main streets to minimize interference with the passenger and public traffic.

**Station Facilities.** Where the character of such buildings can be predetermined, necessary contact with the station, freight, or other facilities should be provided. In any event, nothing should be done to prevent making such contacts in the future when necessary.

**Platforms and Ramps**

**Platforms.** These should be level with the car floor, especially for suburban service. If conditions compel the use of low platforms, provision should be made for future conversion to the high type. Where the width of the platform is restricted by the need for intensive use of the property, the minimum width should permit passengers to move freely between loaded baggage trucks if placed on either side of the platform. Means should be provided to avoid trucking across platforms and tracks.

Baggage elevators should not be located in narrow platforms except at outer ends. When placed at the concourse end, they should not obstruct circulation. The space at the ends of the tracks in a stub station, and known as the “midway,” permits the placing of elevators, stairs, and similar features without encroachment upon the concourse or interference with public circulation. It also permits the use of several train gates for one platform, thereby speeding the exit of arriving passengers.

Separate baggage platforms are not ordinarily necessary. The handling of baggage on passenger platforms causes but slight interference with the movement of passengers. Suburban trains carry practically no baggage. Inbound, long distance trains normally occupy the platform for a considerable time beyond the short interval required to discharge passengers. In the case of outbound long distance trains, the passengers are so thinly distributed that no appreciable interference results. If separate baggage platforms are provided, they must be ample in width, as narrow platforms are useless.

The spacing of platforms and tracks, particularly if lines of columns are necessary, should be designed to permit rearrangement of platform widths if needed. Column lines for superimposed structures, in the absence of controlling conditions to the contrary, should be located in the platforms instead of between tracks, thereby reducing danger to overhead structures, bettering the view for operation of trains, adding to safety, and facilitating maintenance. Columns in platforms interfere only slightly with passenger movement. The loss of space is small, whereas when between tracks the space is entirely lost.

**Ramps.** Where the tracks and streets are necessarily at different levels, the vertical travel should be by means of ramps rather than by
elevators or stairways. In general, ramps are conducive to more rapid circulation, cause less fatigue, and reduce the number of accidents. Where the foot of a passenger ramp extends several car lengths or more from the station end of a narrow platform, provision should be made to avoid backward travel of arriving passengers.

**Track Facilities**

A reasonable proportion only of the station tracks need be of sufficient length to take the longest trains likely to be operated. Excessive rates of curvature and grade should be avoided on the score of effective and safe operation. Tracks along platforms, especially when of the high type, should be straight.

If overhead building construction is contemplated, the track spacing and location of special track work should afford reasonable opportunity for the placing of columns and for avoiding long building spans.

Where conversion from steam to electric power is a possibility, provision should be made that will permit the installation of electrical features, affecting the tracks, platforms and buildings.

**Special Structural Requirements**

In addition to the usual provision for the effect of temperature changes, all buildings, the rental and use value of which are adversely affected by excessive vibration, should be entirely separated as to their foundations and other structural parts, from similar parts in other buildings and structures, through which the vibration due to rolling or live load may be transmitted.

Columns at track level, where necessary, should be protected by suitable collision piers, in order to prevent damage due to derailments. Columns back of track bumping posts should never be in direct line with the track.

The choice of type of future electrification, if initial operation is by steam, should be hampered by structural limitations such as insufficient headroom.

**Auxiliary Facilities**

Wherever possible, provision should be made for the location of all auxiliary operating facilities, such as signaling, central plants, sub-stations, and equipment, entirely separate but accessible from the station facilities. In determining their proper locations, due consideration should be given to the influence of all economic elements, such as land values, economy in handling supplies and waste, and load distribution.

**Size of Station Facilities**

The American Railway Engineering Association has collected voluminous statistics as to sizes of the principal facilities based on the number of...
Passengers making use of them. The graphs prepared from these statistics give at once a good preliminary idea of the sizes required. In connection with the rebuilding or enlargement of existing stations, facts and statistics of actual conditions at those stations in the past are given full consideration also in fixing the sizes required.

Some of the features having special influence in determining the exact sizes to be used are:

1. Operating Features. The usual and probable length of trains affects the track, platform and trucking layout. The placing of sleeping cars in advance of leaving time also affects the size of the track layout.

2. Volume of Present and Future Business. These figures, once ascertained or estimated, afford a reliable guide in fixing the preliminary sizes. They may be varied from, for other controlling reasons, as the design progresses.

3. Relative Proportions of Different Kinds of Traffic. Facilities for all-through traffic or all-suburban traffic can be made more compact when the volume is sufficient to justify them. The relative volume of the baggage, mail and express business handled along with the passenger traffic influences the sizes of certain facilities. As these elements of traffic increase, discussion of separate facilities for them arises.

4. Fluctuations in Daily and Seasonal Traffic. Suburban traffic has wide daily and some seasonal variation. Through traffic may vary largely during the day, and has seasonal changes. Mail and express traffic usually has large seasonal peaks. All these have influence in fixing the sizes of special facilities.

PROOF OF ADEQUACY OF DESIGN

General Considerations. Averages and statistics from other terminals, while interesting and helpful, have little final determining value. Each facility must be tested by the local requirements, and the facts of record at the terminal under consideration must finally govern.

Load Coordination. When the general design has been prepared, it is imperative that it should be analyzed to see that no feature is under or over developed, and that all will reach the saturation point at the same time. In doing this, the approaches, switching facilities, and station tracks and all supporting facilities are to be considered and brought into balance. The station facilities proper must also be adjusted in the same way. For example, the size of the ticket office and the number of selling windows have a fairly definite relation to the number of outbound passengers, which number is limited by the saturation point of the track facilities.

Terminal Failures to be Avoided. The successful future of the project can be assured only by having all of its parts coordinated and in balance, and it is especially worthy of note that the apparent failure to check or prove the adequacy of the design in this way is responsible for many of the faults in American terminals.

ARCHITECTURAL OBJECTIVES

The architectural features of the design should reasonably express the purpose of the improvement and emphasize the relative importance of the several parts and of the entrances and exits. Attention should be given to the mass effect which attracts the notice of the public rather than to involved details which are seen and appreciated only by the few. The treatment should be simple and dignified, and elaborate structural detail should be avoided.

It is vitally important that the cost should be kept within reason and that the improvement should be, as far as possible, self-sustaining, to avoid any further burden on the rendering of transportation service. The opportunity to provide commercial office space and facilities for concessions exists in most cases and should be effectively used to carry or help carry the cost of the project and to provide the structural mass for the usually desired monumental result.

It is, above all, vital that the terminal shall be functionally correct and economically sound. After that the ingenuity of the architect has full play within reasonable financial bounds.

CONCRETE EXAMPLES. The illustrations and several of the plates call attention to a few instances where the principles outlined here have been followed by the writer as far as possible in the development of the design, and it is hoped that the study of them in connection with the text may be suggestive and helpful.

BIBLIOGRAPHY

The material used in the preparation of this article is largely drawn from these papers and articles by the writer:


2. "Railway Passenger Terminals." An address before the New York Society of Terminal Engineers.

RAILROAD TERMINALS AND STATIONS

CENTRAL PASSENGER STATION
BUFFALO
FELLHEIMER & WAGNER
ARCHITECTS
AIR VIEW LOOKING EAST

TRACK AND STATION PLAN
CENTRAL PASSENGER STATION, BUFFALO
FELLHEIMER & WAGNER, ARCHITECTS
Photos. New York Central Lines

MAIN CONCOURSE

CENTRAL PASSENGER STATION, BUFFALO
FELLHEIMER & WAGNER, ARCHITECTS

665
CONSTRUCTION DATA

YEAR OF COMPLETION: 1929.
TYPE OF CONSTRUCTION: Fireproof.
EXTERIOR MATERIALS: Brick and stone.
ROOF CONSTRUCTION: Tile and composition.
WINDOWS: Steel and hollow metal.
INTERIOR FINISHING MATERIALS: Marble, tile and plaster.
FLOORS: Terrazzo, tile and cement.
HEATING (TYPE): Two-pipe vacuum return.
VENTILATION: Mechanical ventilation for interior spaces.
TOTAL CUBAGE: 3,720,000 feet.
AVERAGE PASSENGERS DAILY: 10,000.
VIEW SHOWING STREET APPROACHES

STUDY FOR RAILWAY STATION, PHILADELPHIA
FELLHEIMER & WAGNER, ARCHITECTS

667
STUDY FOR A RAILWAY PASSENGER STATION
PHILADELPHIA
FELLHEIMER & WAGNER
ARCHITECTS
UNION TERMINAL, CLEVELAND
GRAHAM, ANDERSON, PROBST & WHITE
ARCHITECTS

Photo, Chicago Architectural Photographing Co.
CLEVELAND UNION TERMINAL

YEAR OF COMPLETION: 1930.
TYPE OF CONSTRUCTION: Fireproof.
EXTERIOR MATERIALS: Stone and masonry.
ROOF CONSTRUCTION: Composition.
WINDOWS: Metal.
INTERIOR FINISHING MATERIALS: Marble, plaster and wood.
FLOORS: Marble, concrete.
HEATING: Steam.
VENTILATING: Mechanical.
TOTAL CUBAGE: 6,400,000.
AVERAGE PASSENGERS DAILY: 20,000.

UNION TERMINAL, CLEVELAND
GRAHAM, ANDERSON, PROBST & WHITE
ARCHITECTS
CONCOURSE, AND ENTRANCE

UNION TERMINAL
CLEVELAND
GRAHAM, ANDERSON
PROBST & WHITE
ARCHITECTS

Photos, Chicago Architectural Photographing Co.
SECTION BETWEEN PROSPECT AVENUE AND HURON ROAD, LOOKING NORTH

SECTION THROUGH WEST RAMP, LOOKING WEST

SECTION THROUGH PROSPECT AVENUE, LOOKING NORTH

UNION TERMINAL
CLEVELAND
GRAHAM, ANDERSON, PROBST & WHITE, ARCHITECTS
Apollo Photos.

(ABOVE)
AIR VIEW

(RIGHT)
STATION TOWER

PASSENGER STATION
HELSINGFORS, FINLAND
ELIEL SAARINEN
ARCHITECT
PASSenger Station
Helsingfors, Finland
ElieL Saarinen, Architect

Apolis Photog.
MAIN ENTRANCE

PASSENGER STATION
KÖNIGSBERG, GERMANY
ERNEST RICHTER, ARCHITECT

Photos: Alfred Kähler undt
MAIN CONCOURSE

PHOTO. ALFRED KULLENWINDT

FRONT ELEVATION AND FLOOR PLAN

PASSenger STATION
KONIGSBERG, GERMANY
ERNEST RICHTER, ARCHITECT
PASSENGER STATION
STUTTGART, GERMANY
PAUL BONATZ, F. E. SCHOLER
ARCHITECTS

679
PASSENGER STATION
STUTTGART, GERMANY
PAUL BONATZ, F. E. SCHOLER
ARCHITECTS
CENTRAL RAILROAD STATION
VIBORG, FINLAND
HERMAN GESELLIUS, ARCHITECT

(ABOVE)
FRONT ELEVATION

(RIGHT)
WAITING ROOM
SECOND CLASS
STUDY FOR STATION BUILDING

STUDY FOR STATION PROJECT

UNION STATION, OMAHA

GILBERT STANLEY UNDERWOOD & CO., LTD.
ARCHITECTS AND ENGINEERS

Photos, Union Pacific Railroad
COST AND CONSTRUCTION DATA

YEAR OF COMPLETION: Not completed (probably 1934).

TYPE OF CONSTRUCTION: Steel frame, concrete slab floors.

EXTERIOR MATERIALS: Terra cotta.

ROOF CONSTRUCTION: Steel trusses, concrete slab, composition roofing.

WINDOWS: Steel.

INTERIOR FINISHING MATERIALS: Basement plaster walls and ceilings, Oregon pine trim. Track level floor, plaster walls and ceilings, Oregon pine trim. Main floor, plaster walls and ceilings, doors and trim white oak, marble pilasters and wainscoting.

FLOORS: Terra cotta and concrete.

HEATING (TYPE): Steam, vacuum.

VENTILATION: Fresh air and extraction.

TOTAL CUBAGE: 2,331,410 feet.

COST PER CUBIC FOOT: 53 cents.

TOTAL COST: $1,150,000.

AVERAGE PASSENGERS DAILY: 8,000.

UNION STATION
OMAHA

GILBERT STANLEY UNDERWOOD & CO., LTD.
ARCHITECTS
UNION PASSENGER STATION
SOUTH BEND, IND.
FELLHEIMER & WAGNER, ARCHITECTS
CONSTRUCTION DATA

Year of Completion: 1929.
Type of Construction: Fireproof.
Exterior Materials: Face brick and stone.
Roof Construction: Copper and composition roofs.
Windows: Hollow metal.
Interior Finishing Materials: Marble, tile, plaster.
Floors: Terrazzo, tile, cement.
Heating (Type): Two-pipe vacuum return.
Ventilation: Mechanical for interior spaces.
Total Cubage: 1,480,000 feet.
Average Passengers Daily: 2,000.

UNION PASSENGER STATION
SOUTH BEND, IND.
FELLHEIMER & WAGNER
ARCHITECTS
SKETCH OF STATION, PROPOSED PARK, PLAZA AND POST OFFICE

PLAZA ENTRANCE

UNION PASSENGER STATION
ERIE, PA.
FELLHEIMER & WAGNER
ARCHITECTS

Photo. New York Central Lines
CONSTRUCTION DATA

YEAR OF COMPLETION: 1926.
TYPE OF CONSTRUCTION: Fireproof.
EXTERIOR MATERIALS: Brick, terra cotta, stone.
ROOF CONSTRUCTION: Composition.
WINDOWS: Hollow metal.
INTERIOR FINISHING MATERIALS: Marble, tile, plaster.
FLOORS: Terrazzo, tile, cement.
HEATING (TYPE): Two-pipe vacuum return.
VENTILATION: Mechanical for interior spaces.
TOTAL CUBAGE: 2,100,000 feet.
AVERAGE PASSENGERS DAILY: 2,500.

UNION PASSENGER STATION
ERIE, PA.
FELLHEIMER & WAGNER
ARCHITECTS
UNION STATION, ATLANTA, GEORGIA
MCDONALD & COMPANY, ENGINEERS AND ARCHITECTS
COST AND CONSTRUCTION DATA

YEAR OF COMPLETION: 1930.
Type of Construction: Steel and masonry.
Exterior Materials: Limestone.
Roof Construction: Cement tile.
Windows: Steel sash.

Floors: Terrazzo.
Heating (Type): Unit blast heaters.
Ventilation: Combined with heating.
Total Cubage: 420,800 feet.
Cost Per Cubic Foot: Approximately 55 cents.
Total Cost: $235,000.

UNION STATION
ATLANTA, GEORGIA
MCDONALD & COMPANY
ENGINEERS AND ARCHITECTS
UNION PACIFIC STATION, BOISE, IDAHO
CARRERE & HASTINGS, ARCHITECTS

UNION PACIFIC STATION, TOPEKA
GILBERT STANLEY UNDERWOOD & CO., LTD., ARCHITECTS
CONSTRUCTION DATA

YEAR OF COMPLETION: About 1926.
TYPE OF CONSTRUCTION: Masonry shell, wood framing.
EXTERIOR MATERIALS: Stucco.
ROOF CONSTRUCTION: Wood, tile finish.
WINDOWS: Wood.
INTERIOR FINISHING MATERIALS: Plaster.
FLOORS: Tile and wood.
HEATING (TYPE): Steam.

UNION PACIFIC STATION
BOISE, IDAHO
CARRERE & HASTINGS
ARCHITECTS

COST AND CONSTRUCTION DATA

YEAR OF COMPLETION: 1927.
TYPE OF CONSTRUCTION: Steel frame, brick filler walls.
EXTERIOR MATERIALS: Brick and terra cotta.
ROOF CONSTRUCTION: Steel trusses, wood rafters and sheathing, tile roof.
WINDOWS: Steel.
INTERIOR FINISHING MATERIALS: Plaster walls and ceilings, oak doors and trim.
FLOORS: Terrazzo and concrete.
HEATING (TYPE): Steam, vacuum.
VENTILATION: Fresh air and extraction.
TOTAL CUBAGE: 976,298 feet.
COST PER CUBIC FOOT: 26 cents.
TOTAL COST: $250,000.
AVERAGE PASSENGERS DAILY: 1,200.

UNION PACIFIC STATION
TOPEKA
GILBERT STANLEY UNDERWOOD & CO., LTD.
ARCHITECTS
PASSENGER STATION
EAST LOS ANGELES
GILBERT STANLEY UNDERWOOD & CO., LTD.
ARCHITECTS

D. L. & W. PASSENGER STATION
MADISON, N. J.
G. J. RAY, CHIEF ENGINEER
D. T. MACK AND A. J. NEAFIE
ARCHITECTS
COST AND CONSTRUCTION DATA

YEAR OF COMPLETION: 1928.
TYPE OF CONSTRUCTION: Hollow tile walls, frame roof.
EXTERIOR MATERIALS: Stucco, cast stone, tile.
ROOF CONSTRUCTION: Wood trusses, trussed rafters, tile roofing.
WINDOWS: Wood.
INTERIOR FINISHING MATERIALS: Plaster walls and ceilings, wood wainscot, Oregon pine doors and trim.
FLOORS: Terrazzo and concrete.
HEATING (TYPE): Gas steam.
VENTILATION: None.
TOTAL CUBAGE: 49,797 feet.
COST PER CUBIC FOOT: 57 cents.
TOTAL COST: $28,773.
AVERAGE PASSENGERS DAILY: 146.

PASSENGER STATION
EAST LOS ANGELES
GILBERT STANLEY UNDERWOOD & CO., LTD.
ARCHITECTS

694
THE DESIGN OF SMALL RAILWAY STATIONS

by

GILBERT STANLEY UNDERWOOD

of the Firm

GILBERT STANLEY UNDERWOOD & CO. Ltd., Architects

THE moderate sized railroad station contains in a smaller degree practically all the departments of the large terminal. They are scaled down, but they are present, and they must be included in perhaps smaller and more difficult areas.

Location is determined by the conformation of the railroad's right of way, the position of the tracks, easy service to the city, train lengths, and the importance of keeping adjacent track-crossing streets open for traffic. There is publicity value in the location of a station at the end of a main street, and there is the more important advantage of allowing approaching traffic to divide naturally, the passenger motor traffic going to a parking space at one end of the building, the baggage and express traffic to the opposite end, and the passenger pedestrian traffic directly to the waiting room at the center. The length of trains serving a station is important. Trains must often stop where existing water columns will serve the locomotive from either direction. Baggage trucks must load quickly and express must be transferred, all without interference with the passengers. Cities often object to trains stopping at cross-overs because of creating possible traffic congestion.

In Topeka, the passenger station was put back 800 feet from the main street to permit free passage across the tracks when the trains are stopped. Tracks sometimes serve both sides of a station, and two or more trains may arrive and leave at the same time. Crossing through or around one train to reach another is dangerous and slow. Where the track level and street level are closely related, a subway is often used. High track levels above the street may be so reached with the waiting room and its related facilities on the street level floor; submerged tracks may best be reached from a concourse and stairs to each track.

Parking space for motors, baggage and express trucks is always necessary, but particularly so where the track level is above or below the street. If the right of way is higher than the street approaches, there must be provided easy access to the levels by ramps for motor cars, by comfortable stairs or ramps for pedestrians, and possibly by a lift for invalids.

There is no rule for determining the exact sizes of rooms in a passenger station except by the study of each individual case. Our own firm has developed a great number of standards, but each
of them may be changed by differing conditions on one railroad or by different railroads. Architectural design is the architect's own province. Each problem must be solved in view of its own requirements. On the Union Pacific system, for instance, we have developed a somewhat different style for each of the different railroads forming the system. (The American Railway Engineering Association recommends these space divisions for the small railroad station which does not have many concession demands: waiting room, 41 per cent; agent's office, 15 per cent; baggage and express office, 26 per cent; women's room, 10 per cent; men's toilet, 4 per cent; women's toilet, 4 per cent.)

The waiting room (in all but suburban stations with heavy commuting traffic) must provide seats to accommodate at least 40 per cent of the outgoing and between-train passengers who use the station. In suburban stations, the size of the waiting room is of little consequence so long as the platforms are long and well protected by sheds of the butterfly or umbrella type. Circulation in the waiting room must be sufficiently clear, after allowing for baggage and the feet of sitters, to reach all of the facilities. Approximately 41 per cent of the space of the building should be devoted to the waiting room, according to the American Railway Engineering Association. In hot districts, an outdoor waiting room gives protection from excessive heat. Slat seats conforming to the proper curve of the body are best. Wide roof projections, awnings, or other means of creating shade are important, and a cooled drinking fountain is necessary.
Electric traction passenger station at White Plains, N. Y.
Fellheimer & Wagner, Architects

Toilet facilities must provide a rest room for women, preferably furnished with a couch, easy chairs, table, telephone booth and drinking fountain. Sanitary vending machines in the toilet room are a requirement. Some state laws require smoking rooms for men, but with the growing tolerance toward this delightful vice, the smoking room is disappearing, and it has become merely a vestibule to the toilet room. The women’s rest room is allotted 10 per cent of the station’s area as an average, and each of the toilet rooms 4 per cent of the floor space.

The restaurant, always in full view of the tracks, is often divided into a dining room and a lunch room by a door-height partition. Most of the space should be allotted to the service of the lunch counter, which gets the bulk of the business. One kitchen should serve both rooms, and one cashier should control them. Where the traffic is small enough, the news stand may face both the waiting room and the restaurant so that the cashier can handle both the stand and restaurant business.

The ticket window should be prominent, and in commuter stations it should be located on the direct line of travel from the street to the train platform, and so arranged that passengers waiting to secure tickets will not interfere with the general flow of traffic. Where a large number of commutation tickets are issued during the last two or three days of the month, it is desirable to maintain a portable booth, or else install a combination, door, parcel, and ticket window. (See page 738.) The A. R. E. A. suggests 15 per cent of the total area as sufficient for the ticket office. The
agent's office should be treated acoustically, particularly when it houses telegraph facilities. The ticket window should be broad, 5 or 6 feet wide at least, preferably grilled with a fairly open design, and provided with a sliding window to close the office from the waiting room. Card tickets, coupon tickets, book tickets, ticket dater, rubber stamps, cash drawer, utility drawer, folder pockets, pistol pocket and reserve ticket stock cupboard (locked) are some of the items which must be built in under the counter.

Provisions for the storage of records and files, ample for a number of years (Interstate Commerce Commission ruling), a clothes closet, sometimes a safe and a desk, and a telegraph sending and receiving table—all are parts of the agent's office equipment. It is desirable to project the office itself, or a bay, beyond the main building line on the track side to provide vision of arriving and departing trains. The operator's table should be located at the track-side window, near which the semaphore signals should be operated. If the telegraph office is not actually in the agent's office, it should, at least, be adjacent to it, so that messages may be handled with dispatch.

The baggage lobby is a recessed room off the waiting room connected with the baggage room. A metal-covered counter divides this lobby, cutting off from view the baggage room. A partition or screen should be provided to house the counter, tag racks, tariff folders, rubber stamps, time check, and the paraphernalia of baggage checking. The full height partition is necessary in cold climates, because baggage rooms are sometimes not heated. In a small station the agent may be baggageman as well, which makes a "Ring For Agent" bell advisable for efficient service.

Baggage and express business may be handled
by a joint agent, or in separate rooms when the traffic is large enough to require it. The problems are much the same in either case. Wide doors (8 feet wide by 10 feet high) should open on both street side and track side. A weighing scale should be placed slightly off the line of travel from street to track. Piling space must be created by use of high windows and clear corners. End doors are sometimes planned to permit egress of baggage and express to motor trucks at the end of the building. It is usually wise to make adequate provision for unclaimed baggage and express, either by setting off a certain portion of the space as "holdover space" or by planning a separate holdover room.

In some moderate sized stations, freight and passenger facilities are combined, and usually the bulk of the business handled is "LCL" (less than carload). Some argue that this is not wise, because of the advisability of having one building to operate in case fire destroys the other. The freight handling quarters should be as near to the main office as possible if both are handled in the same building. The freight house floor must be at car-bed height. Refrigerator and freight cars are not the same from top of rail to car bed, and floor levels and platforms must be adjusted to the type of traffic involved. A large station will require toilet facilities for employees and truckers. Frequently, too, a hot and cold room may be needed, insulated for perishables in summer and freezables in winter. For merchandise too heavy to be stolen and not harmed by weather, an additional platform (covered or open) is part of the freight storage equipment. For end-loading cars (automobiles, etc.) there must be a platform at the end of a stub track. Gas, oil, air and water must be provided for motor cars leaving under their own fuel. A ramp should, of course, con-
nect the platform with the ground. A hand crane may be installed for lifting heavy merchandise from truck to platform or to car.

This article scratches the surface only. There are unlimited special problems. To name only a few, a station in a college town must be designed to take heavy peaks of passenger and baggage business; a freight house handling LCL shipments of cement, flour, dry food stuffs, etc., must have protected platforms on both track and street sides; platform lighting must be adequate and properly controlled; stations must have the name of the town or city on the track side as well as on both ends, all well lighted. Some other points may be noted. There must be water connections for flushing the platforms, and convenience outlets for carlights along freight platforms; steam must sometimes be provided in a central heating plant for railroad cars as well as for the station; fire protection demands hose cabinets and chemical cans in convenient positions.

In the opinion of many, the proper landscaping around a passenger station is as important as the building. The most carefully designed structure looks raw and naked without landscaping. We on the Union Pacific have solved that problem by turning over the work to a nationally known landscape architect, Daniel R. Hull, who has provided planting curbs around the base of the building for foundation planting, and has developed parked areas at either end. Hardy shrubs and trees are perhaps the best plant forms to use, since other varieties are likely to die from lack of care. Sprinkling systems for lawns are expensive, but are worth it. In the desert areas, it is actually inspiring to hear travelers remark on the oasis-like beauty of the landscaping; and this type of beauty is the cheapest to get and to keep.
The airport building must be developed, independent of precedent, upon the bases of economic and social demands. It is an increasingly important unit of a new transportation, and demands imagination and a thorough understanding of airport organization for its solution.
THE building requirements of airports are in direct proportion to the popular demand for air travel, which is dependent upon the factors of relative cost and safety in operation. The first regularly operated airway in the United States was opened in 1918, and organized passenger transportation had its inception in 1928. A report by the Aeronautical Chamber of Commerce covering the first six months of 1930 shows a total of 10,725,335 miles flown with 133,005 passengers carried by 29 reporting air transport companies. These are incomplete figures, as there are more than 29 transport companies in operation, and it is estimated that the yearly total will reach to 25,000,000 miles with over 300,000 passengers carried. Many figures might be given relative to improvement in equipment, increase in carrying capacity and comparative safety of airplanes, but their implication should be evident from those already given. They would merely indicate that an increasing public demand is moulding a novel experiment into an important commercial reality, and that any serious discussion of transportation problems must include a consideration of air travel facilities.

REQUIREMENTS OF AIRPORT SITES

The operation of an airplane is a combination of the operative characteristics of a ship and a motor bus, and requisite airport facilities are based upon factors influencing its navigation, consequent to its servicing and dependent upon its use. Certain factors are basic in airport design without regard for particular use, specific location in relation to urban centers, variations in

703
consequent lessening of safe climbing ratios and a reduction in landing speed. Such developments would demand the expansion of an airport to closely parallel the principles of space organization now pertaining in railroad terminals, and although potential, should not be considered as improbable.

The probability of expansion colors at the present time every discussion of airport requirements. Planning for such requirements should be farsighted and complete in relation to the type of airport and the limiting influences of location. Actual building projects, however, should be as modest as actual operations will allow. It should be constantly borne in mind that aviation as a new industry requires the firmest commercial basis and that rigid economy in the fulfillment of airport needs should rule development procedure.

2 **Size and Shape.** These factors of an airport are determined by the size and shape of the landing fields—in turn influenced by distance from important urban centers, cost, type of airport and the characteristics of the surrounding terrain. The size will be determined largely by the first three items with the addition of the expansion factor already mentioned. The shape will develop automatically from the last item, influenced as well by the scope of ultimate plans and the prevailing meteorological conditions. Many theoretical recommendations have been made regarding ideal shapes for landing fields, and runway patterns have been designed to provide maximum ease and number of landings and take-offs. These patterns are based upon an all-way landing field where a continuous change of wind direction is encountered. In practice, however, airport sites are selected, insofar as is possible, in terrain where the direction of prevailing winds is usually constant, and, since airplanes should land and take-off directly into the wind, the pat-
tern of runways is largely controlled by special local conditions. In addition the shape will be influenced by the placement of airport structures and the location of surrounding obstructions, both of which may also have bearing upon the size of landing fields.

3 Freedom from Obstructions. The airport site should be entirely free from obstructions of any sort. For the field itself unevenness and a grade over 2½ per cent constitute hazards for airplanes; and, for the surroundings, heights of buildings, trees, hills, etc., regulate the effective landing area and have a definite bearing upon the future development of the airport. The Department of Commerce has fixed a ratio of 7 to 1 as a safe gliding angle for planes operating at sea level. The effective area of landing fields is reduced therefore by 700 feet for every 100 feet of boundary obstruction height. At higher altitudes this increases according to the chart in

![Fig. 1](image)

**Fig. 1.** The relative danger of obstructions depends somewhat upon the type of plane, as small, fast planes climb more sharply than large transports. In consideration of an airport within easy reach of a city, however, the flattest angle must prevail to promote the operating flexibility of the field. Regardless of plane types, sharply veering winds with rapidly changing velocities and the presence of smoke or fog constitute hazards that should be completely charted before the airport site is accepted.

4 Accessibility. The characteristic of commercial air travel is speed with a consequent saving in time. The airport must be easily reached, therefore, from adjacent centers within a relative minimum of time or it has defeated its own purpose. The airport site must be located on a well paved highway, and may be served by rail

Runway patterns are influenced by the direction of the prevailing wind, the location of airport structures and the character of the surroundings. Provision should be made for future expansion as indicated in the diagram of the Detroit Municipal Airport...
or water as well as motor transportation. It should be so placed in relation to these facilities that they do not constitute a barrier to subsequent growth, but provision for intimate transfer relations should be made. Though close contact with urban centers is necessary, an airport surrounded by congested areas containing high structures is not safely accessible to present prevailing type of planes. If the selection of an airport site holds the possibility of intensive building development, the controlled area should be large enough to insure the airport against early obsolescence caused by future building to constitute ineradicable obstructions.

TYPES OF COMMERCIAL AIRPORTS

Due to the rapidity of its growth, the great number of technical problems still demanding solution and much unfortunate exploitation, the aviation industry is still generally unorganized. Although at the present time many aeronautical interests are grouped together, the evident tendency is toward the specialization of activities similar to the organization pertaining in railroad and steamship transportation companies. Within a short time manufacturing and testing will be separated from centers intimately concerned with public service, and the same division will undoubtedly take place with the location of flying schools outside the limits of commercial airports. The scope of this division, however, depends upon the subsequent development of the industry.

Airports should be quickly accessible to urban centers, but should be located to prevent early obsolescence due to intensive building developments. The Central Airport at Camden, N. J., is on the main traffic arteries connecting Camden, Philadelphia and Atlantic City, and controls sufficient area to assure such expansion as may be necessary.

Airports proper may be divided into three general types: (1) Privately owned commercial centers, (2) Public transport terminals, and (3) State or municipal airports.

As regards size, shape, lighting, navigation aids and general aeronautical equipment, they may be similar in conformation with the requirements of the Aeronautics Branch of the Department of Commerce, listed in Aeronautics Bulletin No. 16. As regards the building requirements, however, they may differ widely. The classification has been stated in relation to type of organization, and buildings should be planned to fill the specific needs of airport activities arising as results of administrative policies.

1 Privately Owned Commercial Centers. The organization of such airports has for its primary consideration the operation of its facilities for profit, and its activities may include any or all of the following:

(1) Rent of land to manufacturers.
(2) Lease of buildings to flying schools.
(3) Concessions, such as fuel, hotel and restaurant, repair service, etc.
(4) Rent of hangar space for storage or overhaul of planes.
(5) Sales agencies for various types of planes.
(6) Operation of lights on government airways.
(7) Air taxi lines and joy riding.
(8) Lease of airport facilities to transport lines.
Whether or not the business of the airport is concerned with all of these items, the minimum building requirements include (1) provision for plane storage, overhauling, fueling and minor repairs; (2) provision for administrative facilities, rest rooms, limited permanent accommodations for personnel, restaurant or lunch room, communications—radio, telegraph and telephone—weather reports and first aid. The placement of these facilities is dependent upon the size and shape of the airport, the pattern of runways or taxi strips, and upon the location of motor roads and rail lines. An airport of this type will usually be served only by a road, as it depends for its income largely upon the patronage of local interests, and should be situated as near as possible to them. If the probability exists that it may be served by rail, provision for passenger stations with all the facilities should be made.

The airport concessions may be expanded to include public recreational facilities, such as swimming pools, golf courses, both regular and miniature types, tennis courts, etc., and in some localities the entire development may become a popular resort, with flying as its principal attraction. The necessary buildings for such concessions do not differ generally from others of their type, but should be designed as one- or two-story structures to prevent their becoming obstructions to planes. If flying schools are operated on lease, or if transport terminals exist, office space, waiting rooms, etc., will probably be rented in a building owned by the airport company. This is advisable, as it provides a centralized control of field traffic and enlarges field facilities by keeping building areas at a minimum. Plans for such a structure should provide for a separation of independent activities; and circulation, field exits,

One structure may house concessions and field administration on a small airport. Washington Airport, Washington, D. C. Holden, Stott & Hutchinson, Architects

Tobbs & Knell
An airport necessity. Restaurant and lunch room at Valley Stream, Long Island. Kenneth Franzheim, Architect

Hood
Commercial airport concessions often include resort facilities. The swimming pool at the Central Airport at Camden, N. J., is typical of good practice for this type of airport building. The pool and all accessory structures are floodlighted.
A compact, well-planned airport. Public facilities are centrally located and close to plane service and storage. Parking areas are close to buildings and the surfaced public promenade is separated from the flying field by fences. Rotterdam Airport, Holland.

Roosevelt Field, Mineola, L.I., one of the oldest and largest fields in America. It was started during the World War, and is now used as a manufacturing site as well as a commercial airport. It is efficiently surfaced for a large volume of air traffic.

Administration and terminal units of the Schiphol Airport, Holland. Notice the efficient arrangement of surfacing to serve both hangars and terminal, the large parking area, and the separation of the flying field from public grounds.
etc., should be projected in relation to private taxi lanes to avoid congestion of general field operations.

2 Public Transport Terminals. Public air transportation may be divided into two classes—
(1) lines operating independently, solely as air travel units, and (2) lines that are subsidiary to railroad or motorbus corporations and operate in conjunction with such established facilities. The building requirements of the two types are similar in their salient aspects, though the latter may require a special consideration in view of the implied transfer of travel means.

Normally, many of the commercial features of the privately operated airport are absent, though a terminal airport may lease areas for manufacturing or sales purposes. There is an essential difference between the two types. The private airport is developed as a source of income by itself; in the transport terminal such income is incidental and the primary consideration is fast transportation service.

The terminal buildings should be planned to provide the maximum of comfort and convenience to passengers, consistent with the size and importance of the airport, and should include a central waiting room, information and ticket booth, news and refreshment stand, restaurant or lunch room, toilets, pilots' quarters, communications and weather reports office, airport executive offices and field control room. The public facilities should be definitely separated from all others, which should be grouped to facilitate communication.

The plane buildings should be planned to promote the maximum of efficiency in plane servicing. Hangar space, repair shops, and fueling areas should be located close to the field passenger exit of the terminal building to minimize plane taxiing.

3 State or Municipal Airports. The functions of airports under this heading may include any or all of the factors present in the foregoing classifications and in addition may include facilities for expositions, public air meets, parks, and civic center developments. The essential difference in purpose and equipment is indicated by the type of ownership and administration. Since it constitutes primarily a public benefit—even though some portions may be leased by private interests—the problems of crowd circulation and control should be solved for the probable maximum anticipated by the airport's size, its proximity to the municipality and the ease with which it is reached. A separate administrative building is usually not as important as in other types of airports, though the determined activities may make it desirable in some instances. If terminal
Airports attract crowds of spectators, and easily accessible parking areas should be provided, so placed, however, that they do not constitute an obstruction to field activity.

Separation of public space from the flying field is essential for safety and convenience of field operation. Terminal field exits should also be fenced to exclude spectators.

Hangars should be close enough to the terminal structure to admit of quick service and a minimum taxi run, but removed enough so that the motor exhaust and the propeller stream are not objectionable.
facilities are leased, the area should be separated from municipal grounds, and separate facilities for planes and passengers provided.

Concessions of various sorts will be necessary. They may be extended to approach the resort type of a private commercial venture and provision for spectators should be made by reserving ground for the erection of temporary grandstands or by the utilization of flat roof areas.

FACTORS OF PLOT PLANNING

Airport buildings should be located to meet the following requirements:

1. **Accessibility from Land Transportation Routes.** Hangar, concession and terminal buildings should be close to roads, and provision made for automobile parking in their vicinity, the size of the area depending upon the importance and location of the airport. In large terminals weather protection should be afforded passengers arriving by bus or train.

2. **Convenience in Airport Operation.** Terminal buildings or loading centers should be centrally located in relation to other structures. Hangars should be near enough to them to avoid long taxi runs, but should be placed to accomplish a minimum of plane maneuvering preparatory to take-off or taxi runs to loading centers. Buildings should be grouped in areas least effective as landing fields. They may be placed near the juncture of runways, but not at the ends, as they would there constitute obstructions.

Areas reserved for probable expansion may be used temporarily as concession space, in which case they should be separated from airport activities by fences. The same separation should be planned between passengers or airport operatives and sightseers, special provision being made to keep the landing field and hangar area clear of spectators at all times, while still allowing an unobstructed view of field activities.

CONSIDERATIONS IN BUILDING DESIGN

The height of all structures should be kept to the practical minimum and requirements met by horizontal planning and, where the terrain permits, by the utilization of basement space. Public areas should be separate from offices, control rooms, operatives quarters and service areas, and private access to the last three from the field is desirable.

Buildings should be in every case as clear in plan, and direct in elevation as is possible. It should be remembered that structures are utility buildings, seen from the air as well as the ground, and non-essentials tending to confuse a pilot or offer an obstruction to his plane should be avoided. The disposition of parts should clearly
Concession structures will be determined by particular requirements. Usually they are gas stations, garages or lunchrooms, but may include the resort facilities already mentioned.

The foregoing planning requirements are common to the average airport. Problems including large freight areas, post offices, customs and immigration offices, extensive shopping areas, a hotel and facilities for railroad and subway transfers are extraordinary and require much research and careful study for their proper solution. In many cases expansion may include any or all of these items, and where even a remote possibility of such development exists, space for their installation should be reserved in the airport plan. Such projects are entirely dependent upon the progress of the airplane itself. If airplanes develop in size and safety to compete with other means of transportation, large and complex airports will become a necessity. Until that time, airport buildings should be designed to serve the strict and peculiar demands of air travel with the minimum of effort and expense and the maximum of efficient service.

**BIBLIOGRAPHY**

*The American City*, New York. Articles on airports and city planning.

*Airports*. Flushing, Long Island, N. Y. Current articles on all phases of planning.


*Airport Rating Regulations*. Department of Commerce, Aeronautics Branch, Washington, D. C.

*Construction of Airports*. Department of Commerce, Aeronautics Branch, Washington, D. C.


AIR TRANSPORTATION BUILDINGS
TERMINALS AND HANGARS

The Grand Central Air Terminal
Glendale, California
H. L. Gogerty
Architect

View from the Flying Field
GRAND CENTRAL AIR TERMINAL
GLENDALE, CALIFORNIA
H. L. COGERTY, ARCHITECT

714
Mott Studios

TERMINAL BUILDING FROM THE STREET

Main Lobby and Stair to Restaurant

GRAND CENTRAL AIR TERMINAL
GLENDALE, CALIFORNIA

H. L. GOGERTY
ARCHITECT

715
COST AND CONSTRUCTION DATA

NAME OF BUILDING: Grand Central Air Terminal.
LOCATION: Glendale, Calif.
ARCHITECT: H. L. Gogerty.
YEAR OF COMPLETION: 1929.
TYPE OF CONSTRUCTION: Class “C” Structural steel skeleton with masonry exterior walls.
EXTERIOR MATERIALS: Masonry with plaster and cast stone finish.
ROOF: Tile.
WINDOWS: Steel.
INTERIOR FINISHING MATERIALS: Plaster, ornamental tile, wrought iron.
FLOORS: Concrete and wood.
HEATING (TYPE): Gas steam.
VENTILATION: Exhaust system in cafe portion.
TOTAL CUBAGE: 415,000 feet.
COST PER CUBIC FOOT: 36c.
TOTAL COST: $150,000.
AVERAGE PASSENGERS DAILY: Week days 150 to 200.
Holidays and Sundays 350 to 500.

GRAND CENTRAL AIR TERMINAL
GLENDALE, CALIFORNIA
H. L. GOGERTY
ARCHITECT

716
THE ARCHITECTURAL FORUM

PLATE 179

Courtesy Boeing Air Transport

THE AUSTIN CO.
ARCHITECTS & ENGINEERS

UNITED AIRPORT
BURBANK, CALIFORNIA

717
FROM THE FLYING FIELD

MAIN LOBBY

THE AUSTIN CO.
ARCHITECTS & ENGINEERS

UNITED AIRPORT
BURBANK, CALIFORNIA
UNITED AIRPORT
BURBANK, CALIFORNIA
THE AUSTIN CO.
ARCHITECTS & ENGINEERS
ENTRANCE TO HANGAR

CURTISS-WRIGHT HANGAR
LOS ANGELES, CALIFORNIA

721
NAME OF BUILDING: Curtiss-Wright Hangar.
LOCATION: Los Angeles, Calif.
ARCHITECT: Gable & Wyant.
YEAR OF COMPLETION: 1929.
TYPE OF CONSTRUCTION: Structural steel framework, hollow concrete block walls, also walls of 2½" concrete on rib metal lath and steel channels.
EXTERIOR MATERIALS: Walls—concrete and hollow concrete block brush coated with colored waterproof stucco paint.
ROOF: Corrugated galvanized iron on steel trusses.
WINDOWS: Steel sash.

HANGAR DOORS: Steel, overhead type, power driven.
INTERIOR FINISHING MATERIALS: Plastered walls and ceilings, painted; Douglas fir wood trim, stained and glazed, antiqued ornamental ironwork. Steel stairs, steel fire doors.
FLOORS: Concrete, cement finish, acid stained and hardened.
HEATING (TYPE): Gas-steam radiation.
VENTILATION: Roof ventilators.
TOTAL CURBAGE: 396,540.
COST PER CUBIC FOOT: 15 cents.
TOTAL COST: $63,097.50.
AVERAGE PASSENGERS DAILY: 50.

CURTISS-WRIGHT HANGAR
LOS ANGELES, CALIFORNIA
GABLE & WYANT
ARCHITECTS

722
GENERAL VIEW FROM FIELD

SPECTATORS' PROMENADE

HANGAR BUILDING
CURTISS-REYNOLDS AIRPORT
CHICAGO, ILLINOIS

REBORI & WENTWORTH
ARCHITECTS
COST AND CONSTRUCTION DATA

NAME OF BUILDING: Curtiss-Reynolds Airport.

LOCATION: Chicago, Ill.

ARCHITECTS: Rebori & Wentworth.

YEAR OF COMPLETION: 1929.

TYPE OF CONSTRUCTION: Steel.

EXTERIOR MATERIALS: Silica Brick and Steel—Concrete Ramps.

Roof: Steel I Plate Roof Decking with Asphalt Roofing.

WINDOWS: Steel.

INTERIOR FINISHING MATERIALS: Steel I Plate used for ceilings; steel panels; steel shelving; all doors of steel.

Floors: Cement.

HEATING (TYPE): Steam with unit heaters.

TOTAL COST: $310,000.

CURTISS-REYNOLDS AIRPORT
CHICAGO, ILL.

REBORI & WENTWORTH, ARCHITECTS
DETROIT MUNICIPAL AIRPORT
DETROIT, MICHIGAN
CITY ENGINEERING DEPT., ARCHITECTS
PERSPECTIVE OF FUTURE DEVELOPMENT

PLAN OF THE AIRPORT

COST AND CONSTRUCTION DATA

NAME OF BUILDING: Detroit Municipal Airport.
LOCATION: Detroit, Michigan.
ARCHITECT: Bureau of Public Structures, City Engineer's Office.
YEAR OF COMPLETION: 1930.
TYPE OF CONSTRUCTION: Fire resistant.
EXTERIOR MATERIALS: Face brick and limestone.
ROOF: Four-ply asbestos on 3/4" insulation, over precast concrete.

WINDOWS: Steel pivoted.
INTERIOR FINISHING MATERIALS: Salt glazed brick.
FLOORS: Concrete with super cement finish.
HEATING (TYPE): Unit heaters.
VENTILATION: Windows.

TOTAL CUBAGE: 9,440,000.
COST PER CUBIC FOOT: 11.66 cents.
TOTAL COST: $1,100,000.
AVERAGE PASSENGERS DAILY: 20 to 50.

DETROIT MUNICIPAL AIRPORT
DETROIT, MICHIGAN
CITY ENGINEERING DEPT., ARCHITECTS
DECEMBER, 1930
THE ARCHITECTURAL FORUM
PLATE 184

GENERAL VIEW FROM THE FIELD

DETAIL OF MAIN ENTRANCE AND CONTROL TOWER

MAIN HANGAR
GIFFELS & VALLET, INC.
ENGINEERS & ARCHITECTS

WAYNE COUNTY AIRPORT
WAYNE COUNTY, MICHIGAN

727
COST AND CONSTRUCTION DATA

NAME OF BUILDING: Wayne County Airport—Main Hangar.

LOCATION: Middlebelt and Goddard Roads, Detroit, Mich.

ARCHITECTS: Giffels & Vallet, Inc., Engineers and Architects.

YEAR OF COMPLETION: 1930.

TYPE OF CONSTRUCTION: Long span, steel, brick and concrete floors.

EXTERIOR MATERIALS: Brick and aluminum spandrels.

ROOF CONSTRUCTION: Steel trusses, cement tile, composition roofing.

WINDOWS: Steel sash.

INTERIOR FINISHING MATERIALS: Salt glazed brick and plaster.

FLOORS: Concrete and terrazzo.

HEATING (TYPE): Steam—unit heaters and direct radiation.

VENTILATION: Natural, except in toilets.

TOTAL CUBAGE: 2,000,000 feet.

COST PER CUBIC FOOT: 20 cents.

TOTAL COST: $400,000.

AVERAGE PASSENGERS DAILY: Just recently opened.
HANGAR BUILDINGS
WAYNE COUNTY AIRPORT
WAYNE COUNTY, MICHIGAN

GIFFELS & VALLET, INC.
ENGINEERS & ARCHITECTS

729
COST AND CONSTRUCTION DATA

NAME OF BUILDING: Wayne County Airport—Military Hangar.

LOCATION: Middlebelt and Goddard Roads, Detroit, Mich.

ARCHITECTS: Giffels & Vallet, Inc., Engineers and Architects.

YEAR OF COMPLETION: 1930.

TYPE OF CONSTRUCTION: Long span, steel, brick and concrete floors.

EXTERIOR MATERIALS: Brick and aluminum spandrels.

ROOF CONSTRUCTION: Steel trusses, cement tile, composition roofing.

WINDOWS: Steel sash.

INTERIOR FINISHING MATERIALS: Salt glazed brick and plaster.

FloORS: Concrete and terrazzo.

HEATING (TYPE): Steam—unit heaters and direct radiation.

VENTILATION: Natural, except in toilets.

TOTAL COST: $100,000.

AVERAGE PASSENGERS DAILY: Just recently opened.
VIEW FROM FLYING FIELD

INTERIOR OF WAITING ROOM

TERMINAL BUILDING
PAN-AMERICAN AIRWAYS
MIAMI, FLORIDA
DELANO & ALDRICH, ARCHITECTS
CONSTRUCTION DATA

NAME OF BUILDING: Miami Terminal, Pan-American Airways, Inc.
LOCATION: Miami, Florida.
ARCHITECTS: Delano & Aldrich.
YEAR OF COMPLETION: 1928.
TYPE OF CONSTRUCTION: Fireproof concrete.
EXTERIOR MATERIALS: Concrete and stucco.
ROOF CONSTRUCTION: Sheet steel slab-painted.
WINDOWS: Metal.
INTERIOR FINISHING MATERIALS: Wood and metal.
FLOORS: Cement.

PAN-AMERICAN AIRWAYS
MIAMI, FLORIDA
DELANO & ALDRICH, ARCHITECTS
CHATTANOOGA MUNICIPAL AIRPORT
CHATTANOOGA, TENN.
WILLIAM CRUTCHFIELD, ARCHITECT
CHATTANOOGA MUNICIPAL AIRPORT
CHATTANOOGA, TENN.
WILLIAM CRUTCHFIELD, ARCHITECT

734
WASHINGTON AIRPORT
WASHINGTON, D. C.
COST AND CONSTRUCTION DATA

NAME OF BUILDING: Washington Airport.
LOCATION: Washington, D. C.
ARCHITECTS: Holden, Stott & Hutchinson.
YEAR OF COMPLETION: 1930.
TYPE OF CONSTRUCTION: Frame.
EXTERIOR MATERIALS: Brick veneer base, stucco walls.
ROOF: Canvas deck.
WINDOWS: Steel Sash.
INTERIOR FINISHING MATERIALS: Plaster and Paint.
FLOORS: Rubber tile.
HEATING (TYPE): Steam.
VENTILATION: Windows.
TOTAL CUBAGE: 58,000 feet.
COST PER CUBIC FOOT: 50 cents.
TOTAL COST: $29,187.78.
AVERAGE PASSENGERS DAILY: 50 sightseeing and 30 transport.

HOLDEN, STOTT & HUTCHINSON
ARCHITECTS

WASHINGTON AIRPORT
WASHINGTON, D. C.
PAUL AND KLAUS ENGLER
ARCHITECTS

TEMPLEHOF AIRPORT
BERLIN, GERMANY

Photos. Courtesy German Information Bureau
BASEMENT
1. 2. 3. Kitchen, pantry, etc.
4. Toilets.
5. Police.
7. Travel bureau.
8. Bar.
9. Refrigerator.
11. Pneumatic mail tubes.
20. Kitchen, storage, etc.

GROUND FLOOR
1. Wine room.
2. Vestibule and check room.
3. Toilets.
4. Main entrance and exit lobby.
5. Barber shop.
6. Telephones.
7. Vestibule and post office.
8. Ramp.
10. Pantries and restaurant.
12. Flying, weather and customs offices.
13. Lecture hall.

SECOND FLOOR
1-10. Living quarters.
11. Toilets.
12-16. Offices.
17. Radio rooms.
18. Upper part of restaurants, and lecture hall.
20-25. Executive offices.
A PROPOSED
METROPOLITAN AIR TERMINAL
FELLHEIMER & WAGNER, ARCHITECTS
The project was developed as the terminal point of a large air transport line serving, through land routes, a considerable metropolitan area. The salient feature of the plan considered independently of the layout of flying fields provides for a distinct separation of passengers and spectators. Circulation from the ground floor concourse leads out to a large observation area or down to the transport waiting room. Arrivals and departures are controlled from a centrally located station, and passenger traffic is regulated along a corridor facing the field, directly accessible from the waiting room and ticket offices. This project, with the addition of the club and resort facilities, would only be justified in cases where great concentration of air travel facilities were necessary but is worthy of study as an indication of future requirements and a possible solution of many of them.
OFFICE BUILDING, BUS TERMINAL AND HOTEL (RIGHT) VEHICLE ENTRANCE

INTERURBAN CENTRAL BUS STATION
KANSAS CITY
WIGHT & WIGHT ARCHITECTS
Baltimore & Ohio Railroad Motor Coach Station

(Below) Station Office and Lobby

B. & O. Motor Coach Station
New York

Sloan & Robertson
Architects
B. & O. MOTOR COACH STATION
NEW YORK
SLOAN & ROBERTSON
ARCHITECTS
BUS TERMINAL PLANNING

By JOHN C. FISTERE

THE design of a bus terminal is based chiefly on two factors,—the type of passengers who use it, and the size and shape of the plot on which it is to be located. To a large extent the problem is not unlike that of a railroad station, which is not strange, since both are details in the business of getting people from one place to another. The degree of comfort and facility with which the bus terminal aids in doing this indicates the degree of success which it reaches.

Passengers may be divided roughly into two groups, each of which requires different methods of handling. The first group consists of frequent, short-trip passengers, who need little guidance and a minimum amount of service, and who are perfectly content if they can arrive at the station and leave as soon as possible. The second class consists of the profitable, long-distance passengers, who do not travel very often by bus, and who must therefore, receive much more attention while they are in the station. They come early, are impatient guests, use the waiting room, the concessions, the toilet facilities, and ask a lot of questions. Both these types use the same stations, which means that the architect must have his mind on the needs of both in creating his plan.

For the frequent, short-tripper, these services must be considered: ready access to the buses from the street and, conversely, ready access to the street from the buses; small waiting room space, few concessions and toilet facilities; and an abundance of loading area. For the infrequent, long-tripper, the station must provide these requirements: abundant waiting room space and adequate concessions, as well as other service accommodations, including a prominent information desk; convenient toilet facilities; and baggage room space. The proper relation between these two sets of requirements, even though they may be contrary, will produce an efficient bus station.

In general, there are two types of bus terminals, just as there are two types of railroad station,—the stub type and the through type. As their names suggest, the first is located at the end of a route, through which traffic does not pass, but ends; and the second is the type of station

Plan of the Central Union Bus Terminal in the basement of the Dixie Hotel, New York, showing the ramps leading from the street to the turntable and loading area. Emery Roth, Architect
located along the route which accommodates vehicles from two or more directions.

Since the chief interest lies in getting the bus into the station and out again, and in loading and unloading passengers and baggage, that is of primary importance in the plan. Two methods may be used to attack the problem, depending on the location and size of the plot as well as the further requirements of the station. The loading area may be on the same level as the waiting room, or it may be below it; in very rare instances, the loading area could be placed above, but this occurs only when the station has two levels, as in the Kansas City terminal, designed by Wight & Wight, Architects, and illustrated elsewhere in these pages. In that case, the terminal was located on a steep hill, and the design was created to take advantage of the natural ramps which that condition offered.

If the plot runs from one street through to a parallel street, the obvious method of providing ingress and egress is to have the vehicular passage run straight through, with loading platforms parallel to the passage. This is most easily accomplished when the waiting room is above the loading level, for it is then possible to have the passengers pass over the traffic lanes. This is the same principle that is applied in railroad stations which have island platforms for three or more tracks. If this plan is utilized in a through station, it is advisable to have separate stairways or ramps for arriving and departing passengers, leading from the overhead passage to the platforms.

If the waiting room is on the same level with the loading area, the straight-through drive cannot be utilized, because it would be necessary to have the passengers go upstairs to get above the traffic lanes, and then down to reach the buses. There are two alternatives which have proved successful in handling this situation. The first is illustrated in the Kansas City terminal, which
employs the sawtooth platform along the sides. The bus enters, runs past the platform to be used, turns slightly, and backs in, all without undue maneuvering. The second plan is to have the platforms in a stall arrangement, at right angles to the drive, an example of which is the Fresno, Cal., station. This, of course, requires a turntable

if backing and turning are to be avoided. The Fresno station does make use of the sawtooth platform for unloading, but the rest of the platforms are arranged in stalls.

It should be mentioned at this point that some bus companies have seen fit to have their loading areas in the open, either in a public street or a private alley. Under these conditions, the architect’s problem involves nothing more than the creation of a waiting room and the necessary facilities. An example of this is the Fifth Avenue Coach station, West 36th Street, New York, which permits only one-way traffic in a narrow alley, with no provision for future growth. If, for instance, two or three buses were to arrive at the same time, the lane would become bottled up with a possible delay of several minutes to the last bus. This plan, however, might be used on a strictly stub terminal, provided adequate shelter were provided for the entire length of the alley.

In many cases, the straight-through drive will not be possible, because most plots face on streets at right angles to one another or on only one street. Two prominent examples of the latter type are the B. & O. station on the first floor of the Chanin Building in New York, and the Central Union Bus terminal in the basement of the Dixie Hotel in the same city. Where the terminal faces on two streets, the designer has several possible plan solutions, the most efficient type of which is, perhaps, that of the Madison terminal of the Wisconsin Power & Light Co. In this station, the waiting room is above the loading area,
The baggage and parcel office of the B. & O. station on the first floor of the Chanin Building in New York. Exit from the unloading platform is at the right, and the company offices are in the mezzanine above. Sloan & Robertson, Architects.

and stairways lead down to the island platforms. The two entrances to the building are set at an angle of 45 degrees, each of which leads to one of two platforms. The angled entrance allows the buses to make the turn at an easy pace, and eliminates backing and turning after the bus has entered the building.

One Chicago terminal architect was faced with the same problem with the exception that his waiting room had to be placed on the same level as the loading area, which cut out island platforms and overhead passage. He placed his drive on the exterior of the building, providing a curved turn at the corner. The same difficulty of bottling up traffic would occur in this plan if a few buses arrived off schedule at the same time. The Portland, Ore., station is planned on the same general principle except that the turn is effected inside the building, with the loading areas located on the turn itself, thus permitting the bus to make the swing in two movements.

While it has never been put into effect, a plan has been designed by LeRoy Rothschild of Philadelphia which makes use of a uniquely shaped platform, curved, with a protrusion at one end to bring the bus-door up to the platform. The platforms were to be of the island type, with an overhead passage. The driver runs past the end of the platform and backs slightly, cutting his wheels to bring the door on line with the platform extension so that passengers need not step down.
Depending upon the amount of traffic which the terminal must handle, there are two solutions of the problem presented by the one-street site either of which may be employed. For light traffic, the B. & O. station in New York suggests a plan that appears most logical. It has two parallel lanes, which lead to a turntable. A bus enters and deposits its passengers on a platform which leads into a tunnel to the ticket office, baggage room and the street; the bus then advances to the table, and is swung completely around to face the outgoing lane. Passengers are admitted to the bus from the waiting room on the side. The difficulty with this plan is that the waiting room and loading area are separated from the ticket and baggage offices.

For heavy traffic, a most ingenious plan has been worked out for the Central Union Bus terminal in New York. Here, two oblique lanes at street level lead down to a turntable, off of which are ten short lanes to accommodate waiting buses. In appearance, the plan is much like a wheel with 12 spokes (page 709). By placing the terminal in the basement of a hotel, the owners were able to locate it in the heart of the metropolis.

The problem of planning a bus waiting room is just about the same as the problem of planning a railroad station waiting room. If possible, the ticket offices should be on a direct line from the street to the loading area, or, at least, in a prominent position. It is advisable to handle baggage

![Floor Plan](image-url)
with as little interference with the passengers as possible. Separate entrances to the loading area should be provided if possible. If the buses are of the type which carries baggage on the top, a platform or balcony above the loading area is most convenient. Some buses store baggage at the rear, which means that unless an exclusive entrance to the platform is provided, considerable congestion will result at loading time. In all cases, luggage must be handled by attendants as far as the waiting room, where a baggage room should be provided. The inconvenience which would result from giving the passengers their luggage immediately upon alighting is obvious.

As in railroad stations, the waiting rooms should be directly accessible to the loading area, and, if possible, in view of it. One plan which has been adopted is the installation of a glass partition between, which permits impatient passengers to watch the arrival and departure of all buses. In time this may not be necessary, but at present, with bus transportation somewhat of a mystery, passengers are more concerned about missing a bus than they are about missing trains. The loading area ought to be visible from the lunch room as well. An information booth, toilet and wash rooms, newspaper, cigar and candy counters, a bootblack stand, and perhaps a haberdashery shop, drug store and florist shop are some concessions which ought to be arranged for in a terminal of any size. It has been estimated that the concessions should take care of at least 75 per cent of a terminal's running expenses.

Since the present development of bus terminal design indicates problems analogous to those in railroad station planning, the future solution of efficient terminals is likely to be found in studying the methods of railroad station architects, and adapting the findings of their experience. The same principles of circulation discussed by Alfred Fellheimer in this issue are the same principles which should be embodied in bus terminal design.
Among the other users of A.C.F. architectural woodcarvings are the following:


AMERICAN CAR AND FOUNDRY COMPANY • WILMINGTON, DELAWARE
Creating truly fine offices is a pleasant task with Leopold furniture available

One of the interesting duties you face along with every building you design is the creation of modern offices.

That work is much simplified with the availability of Leopold furniture. It is ready to occupy the fine offices you create.

Leopold furniture is produced with that thoughtful attention to detail which makes an article really superb. It is furniture so fine as to design, material and craftsmanship that daily use enhances the satisfaction which the occupant secures from the possession of a truly beautiful office.

Here we show an office which fosters that satisfaction. Other such offices are shown in our booklet "The spirit of gracious living moves downtown." In it you'll find helpful suggestions for office designs, as well as illustrations of a number of fine offices.

Shall we send you a copy?

THE LEOPOLD COMPANY
BUILDERS OF OFFICE FURNITURE AT BURLINGTON, IOWA, SINCE 1876
Sleep, invincibly—such as this street in Bellagio—add much to the picturesque and charm of the hill-town of Lombardy. It is not alone because of its scenery, however, that Lombardy is famous, for Lombardy is the center, in Italy, for the cultivation of the silkworm and the weaving of fine silk fabrics. The design illustrated—developed in a number of delightful color combinations—is a recent Johnson & Faulkner importation, and exemplifies both the beauty and the surpassing quality of the modern Lombardy weave.

***Imported Upholstery and Decorative Fabrics***

Established more than a century ago, Johnson & Faulkner for generations have been importing Old World fabrics to meet the most exacting requirements of the decorative trade. Decorators and their clients are cordially invited to visit the new Johnson & Faulkner Building, and to inspect, under ideal conditions, a comprehensive display of every type of high class fabric required in the decoration of the modern home.
Tradition is a guide but not a master to those architects who have learned for themselves the merits of American Walnut in the decoration of church interiors. Just as they have forsworn the gloominess of candle-light in favor of modern lighting, they have substituted the mellow, softer beauty of American Walnut for the harshness of the materials employed by designers of the distant past.

For architects, adapting the traditional to the needs of today, find that no material so serves to embellish fundamental, structural unity as does American Walnut. No other adds those grace notes of design to the "frozen music" of a composition. American Walnut covers bareness without monopolizing attention. It glows with warm color without being ostentatious. It provides texture to a broad surface without being obtrusive. And it is equally beautiful in broad expanses or intricate carvings.

Architects contemplating the use of wood in design will find our technical consultation service of real assistance in devising patterns, panels, and finishes to meet specific situations. Even our personal service is available, gratis, to any architect.
A Glimpse of Old Spain

The Renaissance brought from Italy and Spain many influences reflected today in Period Furniture that have lived through the ages. While Spanish architecture suggests furniture of Spanish influence, there are many designs of English authenticity that harmonize with the same influence in Spanish and Italian pieces.

You will find in the Kittinger Line many opportunities for harmonious and unique selections of groups and occasional pieces that will emphasize good architectural design.

In the different Showrooms mentioned below, our trained representatives render a special service to architects, decorators and dealers as well as home owners through their specific training . . . to select Kittinger pieces suitable for different requirements. Visit one of our Showrooms or write us for details of the Kittinger Layout Service available to architects through furniture dealers and decorators. We will gladly furnish from blue-prints, layout service plans to show location of pieces augmented by photographs of pieces and samples of coverings. Address Kittinger Company, Dept. 710, N. Elmwood Ave., Buffalo, N. Y.

At home in a Spanish environment! An Elizabethan Dining Group by Kittinger in Solid Walnut. Decorators—Mooro Furniture Co. of Miami, Florida.
SALUBRA'S Architectural Service is particularly helpful to architectural firms who do not feel justified in maintaining a special Department of Interior Decoration, but who desire to broaden and extend their service to clients to include advice on such subjects. The scope of this special co-operative service is as follows: To recommend suitable color-schemes for walls, wood-work and paneling—To make a tentative selection for specific jobs, from Salubra's more than 2000 patterns—To supply samples, and estimate the cost of Salubra from floor plans supplied by the architect. Remember, wherever you are specifying paint for interior walls, Salubra—"paint-by-the-roll"...washable...fadeless...non-porous...may be used to advantage—and Salubra's Decorative Service will prove invaluable. Write for your copy of the folder explaining this new and helpful service in detail.

FREDERIC BLANK & COMPANY, 230 Park Avenue, New York, N. Y. or 24 North Wabash Avenue, Chicago, Ill.

Salubra's Special Architectural Service

SALUBRA

Pattern No. 30833 provides a background of soft pastel shades of cafe, orchid, and yellow in a diamond plaid effect. The screen is also covered with Salubra in a soft blue-green, with figures in contrasting colors. These are but two of hundreds of beautiful patterns designed to harmonize with every type of interior, Period or Modern.

FOUR COLORS OF SALUBRA

* * *

Salubra's Decorative Service will prove invaluable.

THE FOLDER illustrated describes a service which will prove of value to every architect who is asked—as architects so frequently are, these days—for advice on the subject of decorating interiors.
Folder illustrating the features of a Church Pew necessary to permanent comfort and beauty, on request.

Address Department F, DeLong Furniture Company, 1505 Race St., Phila., or 329 Fourth Ave., New York.
TODHUNTER
119 East 57th Street, New York

LIGHTING FIXTURES
Authentic reproductions of Colonial and Early English Lights
Special designs executed to order

The Most Distinguished 18th Century Collection of the Year!

Now on exhibition at the Newcomb Galleries in New York and Boston is the most distinguished collection of Seventeenth and Eighteenth Century antiques from England, France, Italy and Spain it has ever been our good fortune to display at any one time. Attention is particularly called to the scores of originals of the more popular early English eras as well as to the many charming examples of both sophisticated and provincial craftsmen of corresponding French periods. Most of these pieces were collected during the past summer months and have arrived at our galleries only within the past fortnight. The display also includes many new pieces of high merit produced during the summer by Newcomb cabinet-makers. Without question the most important single collection of fine furniture and art objects in Newcomb history.
For Smart Interiors

Harry Sternfeld favors the wood whose charm is ageless

Tidewater Red Cypress (Coast Type) yields a glowing beauty which seems only to mellow with age. Fashionable today, an interior of this Wood Eternal will not have lost its lovely distinction ten...twenty...even a hundred years from now.

Architects and interior decorators throughout the country are employing Tidewater Red Cypress in an ever-increasing number of homes.

Like Mr. Harry Sternfeld, of Philadelphia, who has long sponsored this beautiful wood, they find that its exquisite grain holds a charm rarely equaled for panels, doors, beams and trim.

They also find that no other material is quite so versatile. Stained or varnished, painted or charred, sand-etched or left in its natural state, Tidewater Red Cypress is always richly warm.

A Book of Interiors—sent free

In this illustrated book of interesting interiors, designed by noted architects, you will see how and why Tidewater Red Cypress is being used in greater quantities today than ever before.

We shall gladly send you a complimentary copy. Address the Southern Cypress Manufacturers' Association, Jacksonville, Fla.

If your dealer is not stocked with Tidewater Red Cypress, he can get it for you quickly—or you can write direct to any of the Association Mills listed below.

Tidewater Red Cypress (Coast Type)
The Wood Eternal

This advertisement is published by the following members of the Southern Cypress Manufacturers' Association, Jacksonville, Fla.:

J. Ray Arnold Cypress Co., Groveland, Fla. 
Big Saltwater Cypress Co., Varvarville, S.C. 
Burton-Swartz Cypress Co., Perry, Fla. 
Cawmer Cypress Co., Jacksonville, Fla. 
Diben, Stark & Brown Cypress Co., Donner, La. 
Everglade Cypress Co., Loughman, Fla. 
Feather Lumber Co., Glenwood, Fla. 
Pattison Lumber Co., Shamrock, Fla. 
Putman Lumber Co., Pensacola, Fla. 
Wilson Cypress Co., Palatka, Fla.

Quaker Photo Service

To this intimately warm yet distinctive living room in the home of Mr. W. N. Morice of Fleurtown, Pa., Tidewater Red Cypress lends its inimitable charm. Mr. Harry Sternfeld of Philadelphia was the architect.
French Provincial Woven Wood Fence... an investment in fence satisfaction

Through long years of service, protection, and lasting beauty, the French Provincial Woven Wood Fence will pay steady dividends undiminished by time or weather. The palings of live young chestnut saplings, woven together with Copperweld wire, need no paint to enhance their natural beauty... therefore your first cost is the last. In full five-foot sections ready to erect.

ROBERT C. REEVES CO.
101 Park Avenue New York City

PURE WHITE LEAD for Every Type of Surface... Every Kind of Finish

Washable interior wall paint... undercoatings for enamel... any one of a thousand different tints... flat, egg-shell and gloss finishes... durable, economical paint for wood, plaster, wall board or metal... blended or mottled effects... plastic paint that gives the decorative low-relief textures—any of these you can get with Dutch Boy White Lead. It is the all-purpose, all-round paint material. It makes for convenience and economy to standardize on Dutch Boy White Lead in your painting.

NATIONAL LEAD COMPANY

DUTCH BOY WHITE LEAD

Frankly, do not these considerations come first in your choice of tiles?

Colors deeper, richer and more lasting, tone and texture more mellow and distinctive, range of colors and patterns wider and more authentic, quality more uniform through and through. These characteristics have caused the fast growing preference for Flint Faience, have brought to architects and builders the finest results obtainable with tiles. Faience artists and designers are able to create or interpret the unusual and distinctive in tile design. For any and all work, deliveries are made promptly in accordance with promise. Flint Faience Tiles are a General Motors product. Quality considered, values are the best to be had. Descriptive brochure in full color will be forwarded upon request. In writing, please indicate the nature of your requirements.

FLINT FAIENCE FLINTCRAFT
A genuine handmade tile A high quality machine-made tile

VITROGRAF A durable handmade unglazed floor tile

FLINT FAIENCE & TILE COMPANY
A Division of the AC Spark Plug Company
MAIN OFFICE AND FACTORY: FLINT, MICHIGAN

District Offices:
103 Park Ave., New York City - 1629 Pontiac Ave., East Cleveland, O. 1404 Tribune Tower, Chicago, Ill. - 206 E. Grand River, Detroit, Mich. 2915 Seventh Ave., South, Birmingham, Alabama
Seymour H. Knox Residence, Aiken, South Carolina

"Metal Work by FISKE"

THE Seymour H. Knox residence at Aiken, S. C., is one of many luxurious homes throughout the United States where the ornamental metal fittings have been executed by FISKE. The preference for FISKE is constantly growing among architects and especially among architects whose specifications always call for the finest. For they realize that to specify "metal work by FISKE" is to specify the finest in workmanship, materials and perhaps what is even more important—over 70 years of experience in close cooperation with architects and builders.

The FISKE organization maintains complete consultory and design services which are always available to architects interested in ornamental metal work. Write for illustrated catalogue.

J.W. Fiske IRON WORKS
80 Park Place ~ New York
ESTABLISHED 1858

SPECIALISTS IN ORNAMENTAL METAL WORK
PONDOSA AFFORDS REAL PROTECTION AGAINST THE EXTREMES OF WARMTH AND COLD . . .

Whatever the sun is blazing down, or wintry winds storm outside the home walled with Pondosa Pine stands safely protected. Pondosa Pine is a low density wood, a natural insulator. Pine siding, pine sheathing, and pine lath . . . these three layers . . . with their count less air spaces interspersed within the rigid fibrous structure of the wood . . . serve to retard greatly the passage of heat or cold, and to set up an effective insulating barrier.

In addition to its high insulating qualities, Pondosa is both beautiful and weather resistant. The paint brush goes smoothly over the surface and with fewer coats leaves a lustrous finish free from ripples. That soft and even color will be in evidence for years. And during that time, joints will be tight, cupboard doors work smoothly, and the base-board cling snugly to the floor. Pondosa builds for permanence.

In short, this light, strong Pondosa is ideal for almost any soft-wood purpose, inside or outside. Specify Pondosa by the mark of the pine tree, imprinted on the lumber. Most good lumber yards can supply large amounts of Pondosa quickly. Western Pine Manufacturers Association, Portland, Oregon.

Not a knot in 10,000 columns

Though you personally inspected Hartmann-Sanders Koll Lock-Joint columns at the time of manufacture, you would not find a single knot in ten thousand columns. Moreover, they are correctly proportioned according to the five orders of architecture and authentically represent the periods from which they are taken. They cannot come apart due to the Lock-Joint principle owned and developed by us.

We are equipped to execute particular architectural specifications as well as those standard in nature and invite builders and architects to send us their problems. Send for Catalog No. 48, No charge. HARTMANN-SANDERS CO., Factory and Showroom: 2151 Elston Ave., Chicago; Eastern Office and Showroom: Dept. I, 6 E. 39th St., New York City.

HARTMANN-SANDERS
PERGOLAS • COLONIAL ENTRANCES • KOLL COLUMNS
ROSEARBORS • GARDEN EQUIPMENT

5,000 Model Kitchens
“on File”

All Curtis Kitchen Units in all sizes are reproduced in Miniature Kitchen Sets. Ask your nearest Curtis dealer to show you one of these clever miniature sets. See the almost numberless arrangements of storage units, utility units, drawer sections and the like made possible for your houses this new way.

The kitchen plan once made, Curtis Units come completely set up—ready to fill the available space. Send for “Your Dream Kitchen,” showing a few of the kitchens built with Curtis Units. Let us explain our Free Kitchen Planning Service.

THE CURTIS COMPANIES
SERVICE BUREAU
363 Curtis Building, Clinton, Iowa
Each block is a complete square or rectangular unit of 3 or more flooringstrips, in oak, walnut, maple, beech, light and dark Philippine mahogany, yellow pine or cedars beveled or square edge.

6¼" to 15" squares, 12-14½" thickness, all grades. Rectangle sizes: 6" x 12½", 6¼" x 13½"; also in maple 6" x 13½".

A very material saving in finishing cost is effected by Maple and Beech blocks, factory-sanded, and then CELLized.

WHERE durability of the floor is the first consideration, as in schools, department stores, chain stores, high class factories, etc., pre-sanded CELLized wood floor blocks meet every requirement.

The unit block floor needs only to be laid in EVERBOND, a plastic cement, over concrete or any level sub-floor, before use. The appearance is highly pleasing, and the floor is durable, supporting constant heavy use with ease and noiselessness under foot. Cleaning, if necessary, and polishing may be accomplished in one operation by the application of hard paste-wax, rubbed with steel wool.

The unit block is rapidly laid and the floor is inexpensive in both original and upkeep costs. Laid directly over concrete in EVERBOND, providing a sound-deadening resilient base.

*CELLized wood floor blocks are guaranteed by *CELLized Oak Flooring Inc. Laid only by Licensed Flooring Contractors. The names of those licensed to use this label in your locality will be supplied upon request.

*CELLized by a chemical treat, to reduce the tendency to change in size, insect and decay resistant.
Miles of Steel Partition

Nowhere on earth is the ultra-modern in building materials so widely employed as in the monumental structures of greater Manhattan. To be selected for one of New York’s cloud-piercing business buildings is a warrant of quality and efficiency for any product.

We take especial pride in the use of United Hollow Metal interior trim in the great Bank of Manhattan Building. The New York structures in which United products have been used would make a city in themselves—a monument to United quality.

The United Metal Products Company, Canton, Ohio
BRANCH OFFICES IN ALL PRINCIPAL CITIES

You should have this Insulation Data Book

... A book of practical information and technical data covering all phases of residential and industrial insulation, including valuable charts, diagrams and architectural plates. Sent on receipt of name and address.

INSULATION DIVISION
CHICAGO MILL and LUMBER CORPORATION
111 West Washington Street  Chicago, Ill
Exterior Lighting Fixtures
by
SMYSER-ROYER

The real proof of the merit of any manufacturer is found in the architects who depend upon them for the execution of original designs.

For years Smyser-Royer has demonstrated their ability to faithfully reproduce unusual and difficult designs in iron, bronze and aluminum from architects' original drawings. Many of the finest buildings in the country are equipped with exterior lighting fixtures by Smyser-Royer.

If an original design is not required, Sweet's Catalogue shows a variety of two hundred designs for exterior lighting which Smyser-Royer can furnish economically and on short notice.

SMYSER-ROYER COMPANY
MAIN OFFICE AND WORKS, YORK, PENNA.
PHILADELPHIA OFFICE, 1700 WALNUT STREET
Occasionally there is a building erected so striking in appearance and so unique in location that the architect and owner realize prestige and profit from it to an unusual extent. When a building is not so favored, we suggest an investigation of floodlighting in color and motion. It is effective, dignified, and surprisingly inexpensive, when compared with other forms of publicity. You are assured of our cooperation in furnishing you with adequate information on Mobile Color Lighting, and you will be placed under no obligation in using this service.

Vitrohm Dimmers for all lighting control purposes, arc and spot light ballasts and rheostats, and other electric control devices are among the products made by this company.

WARD LEONARD ELECTRIC CO
MOUNT VERNON N Y

HIGGINS
Black
Your Standard—and Standby—
For Half a Century
WATERPROOF (White Label)  GENERAL (Red Label)

FOR working drawings, tracings, elevations, perspectives and other types of work which must withstand handling and be otherwise exposed, HIGGINS’ WATERPROOF DRAWING INK (the original India Ink) has long shown its superiority.

For exceptionally fine line work, black washes, elevations, perspectives and other “show” and specimen drawings, HIGGINS’ GENERAL DRAWING INK has, since its introduction, stood supreme.

In all probability both these inks are at this moment on your draughting table. Why not put them to all the uses for which they are intended?

The lavishly illustrated handbook, “Techniques,” contains many valuable suggestions. Just write for it on your firm letterhead and mention this magazine. No obligation.

CHAS. M. HIGGINS & CO., INC.
Drawing Ink Makers for Half a Century
271 Ninth Street Brooklyn, N. Y.

WEBER
Riefler Sphinx Dural

WEBER offers you a precision-made drawing instrument for every requirement. Choose WEBER-Riefler for lifetime durability and accuracy . . . WEBER-Sphinx for high quality at moderate cost. WEBER-Dural for extreme lightness. One and all bring you the Original Round System plus many exclusive WEBER features.

F. WEBER CO., INC.
1220 Buttonwood Street, Philadelphia
Branches: St. Louis—Baltimore

WEBER
Drawing Instruments & Materials
SINCE 1856
GREATLY HIGHER VALUE FOR GREATER LESS COST

After all, Roddis Flush Doors when finished cost less than ordinary doors made ready for hanging. Roddis Doors when stained, filled and shellacked at our factory before shipping are protected and preserved in transit against moisture, warping, raising grain, etc. The doors arrive at the job ready to hang, with only the final coat of finish to apply. The sanding and finishing expense is saved; and in addition a far superior door is obtained because of Roddis completely solid construction and permanently enduring beauty and finish. Therefore, where Roddis quoted price might be a little higher, the greatly higher value and economy represented make Roddis price actually lowest.

SPECIAL ARCHITECTURAL DESIGNS MADE TO INDIVIDUAL ORDER

— for residences especially

Before you next decide upon doors write for and read the interesting Roddis Catalog: of exceptionally attractive stock doors, for apartment buildings and residences particularly. Where you require a special inlay or figure design to particularly lend with the interior trim, Roddis Department of Design is at your service: to originate or to follow idea furnished. Roddis Flush Doors, of standard styles or custom made special designs are universally preferred: for most enduring service and beauty and real economy value. Write Roddis now.

RODDIS LUMBER & VENEER CO.
127 FOURTH ST. MARSHFIELD, WIS.

DISTRIBUTORS IN ALL PRINCIPAL CITIES

DOORS by RODDIS

Trade Mark
Red-White Blue Dowel on edge of each Roddis Door. The mark of Roddis identity and quality.
ORANGE Extruded Aluminum SCREENS

HEAVY DUTY ALUMINUM SCREEN DOORS

SEE for yourself how husky the top and bottom rails of our heavy duty aluminum doors are made.

Notice the thickness of the extruded metal—the same strong alloy they use in making airplanes.

Then take into account the non-sag welded corners and deep-set screen key, that never loses its grip on the wiring.

It is because of the way our aluminum doors are made, that we put so rigid a guarantee behind them. You don't need to take our word for their sturdy worth. We will gladly send you sample sections, so that you may judge for yourself.

There's an Orange Screen man in your vicinity, who will show you anything you want to see about aluminum screens. Ask us to send him to you, with complete samples of our aluminum screens.

The drawing shows in actual size the rails of a heavy-duty aluminum screen door. Slender extruded sections are used for light doors and window screens.

ORANGE SCREEN COMPANY
Aluminum Screens and Window Ventilators Also Wood, Steel, Bronze and Roll Screens

MAPLEWOOD, NEW JERSEY
Harmony without Sound—a Modern Floor at R.C.A.-Victor

Its harmonizing colors and design are made possible through a choice of 27 distinctive types in squares and rectangles. • • • Its sound deadening quality is due to the definite, lasting resilience of Stedman Reinforced® Rubber Tile • • • With this adaptable material architects and decorators are meeting all artistic requirements while providing floors that are quiet, comfortable, entirely practical • • • For churches and theatres, hospitals and stores; for the formal rotunda or the modernistic beauty salon, Stedman Tile reveals its superiority in its characteristic color veinings, its remarkable durability and low up-keep cost. • • • You will receive intelligent co-operation from design to installation • • • Booklet and color charts are free.

Stedman Reinforced® Rubber Tile

*REINFORCED: In the Stedman Process minute cotton filaments, uniting with the rubber under high pressure and heat, are responsible for its unusual resistance to wear and distention, its lasting resilience and smooth, impervious surface—characterized by color veinings of remarkable finesse and beauty.

Stedman Rubber Flooring Co.,
SOUTH BRAINTREE, MASSACHUSETTS
TERRA COTTA

ornamentation on the tower of the Merchandise Mart, Chicago,—the world's largest building. Figures are warm gray, spandrels dark green, small circular panels, gold.

TERRA COTTA

alone among architectural materials gives the designer freedom to create a new and vital modern architecture thru the application of color; monumental sculpture and ornament; and the liberal use of gold, silver and platinum in ceramic form.

NATIONAL TERRA COTTA SOCIETY

Please send me your plate series

MODERNE ORNAMENT in TERRA COTTA

Name

Address

City State

Architects have been waiting for this Skylight Shade

This handsome shade is of regular Athey quality workmanship and material, and is made in many sunfast colors. It weighs only 3/8 of an ounce per sq. ft. —is manufactured in almost any size—even as large as 20 ft. x 36 ft. in one leaf.

This popular Skylight Shade is adjusted by a convenient, small wall crank and sometimes from the stage for lecture rooms. It is translucent, shading without eliminating necessary light and giving full light when needed.

Hundreds of successful installations have demonstrated the utility of this superior product.

Write for interesting catalog.
These colorful floors

are in the spirit of today

Approximately 31,000 square feet of Goodyear Rubber Flooring were laid in the striking Richfield Oil Building, Los Angeles. Here is another modern building whose tenants enjoy lasting comfort and pleasure from this modern flooring material.

Goodyear Rubber Flooring is a working material. As made by Goodyear for floors it will wear as long as the building itself. Rubber is resilient. Rubber is silent. Rubber is moisture proof. The colors go the whole depth of the material and are consequently permanently fresh. They do not fade even where wear is hardest as on stairs or in elevator cars.

Rubber Flooring saves tons of building weight.

The smooth and lustrous surface of Goodyear Rubber Flooring—the clear colors and trim patterns—win building occupants. Tenants appreciate the noiselessness and yielding “give” of this flooring underfoot. Owners value likewise its immaculate appearance and the ease with which it is kept up. Goodyear Rubber Flooring cleans instantly with cold water. It does not scar, scuff, or stain.

You can pattern Goodyear Rubber Flooring to agree with any decorative treatment. It is as available to conservative architecture as to the most radical modernism. Yet, in all styles, it has an identical efficiency. It is always comfortable, cleanly, durable, and silent.

Write for Architect’s File, A.I.A. 23C, containing specifications and whole floor designs—Goodyear, Akron, Ohio, or Los Angeles, California.
Timber Trusses
McKeown Bros.
Company
Builders

New York Office
21 East 40th Street

Chicago Office
5235 S. Keeler Ave.

Here are some of the charming old houses, gateways, churches, halls, etc., photographed and measured for this volume:

Isaac Cook House, Brooklyn; Christ Church, Alexandria; Phillipse Manor House, Fanueil Hall; City Hall, New York; Old House Gates, New York; Christ Church, Philadelphia; State House, Boston; Pennsylvania Hospital, Philadelphia; The Taylor Octagon House, Washington; The Whipple House, Salem; Leffert's Homestead, Brooklyn; Phillip's House, Salem; Pinge House, Salem; Erasmus Hall, Brooklyn; Hamilton Hall, Salem; St. Paul's Church, New York; Old South Church, Boston; St. John's Chapel, New York; The Taylor House, Roxbury; State House, Philadelphia; Mount Pleasant Mansion, Christ Church, Philadelphia; House In Shirley, Virginia; Joseph Cabor House, Salem; Forrester House, Salem; Shreve House, Salem; Haven and Ladd Houses, Portsmouth; South Church, Salem; City Hall and Trinity College and a number of other public buildings in Dublin and England.

Over 1,000 photos and scaled details are included.

The Georgian Period
Students' Collection from Original Edition
Edited by Wm. Rotch Ware

Every architect should have a good reference to the Georgian or Colonial architecture in America. This volume is recognized as the standard authority on the subject. It was prepared at great expense by a corps of men who actually photographed and measured each house.

This "Students' Collection" comprises 100 plates, carefully selected from the 450 in the complete edition. They are from the original printing and show every detail clearly. The photographs, which were reproduced by the Heliotype process, are large enough to show every detail of the ornamentation. The measured plates not only show the scaled drawing of the whole mantel, cornice, doorway, or whatever it may be, but also give all the profiles or sections, and larger sized details of all important points.

When you are looking for a suggestion for exterior treatment of the house, church, hall, gateway, cornice, or for a stairway, mantel, cabinet, iron grille, etc., you are certain to find a great many charming examples on each subject from which to make your selection.

100 Plates 10 x 14 inches, 28 Pages Text, Portfolio. Price $15.00 delivered.

Architectural Forum Book Department
521 Fifth Avenue, New York
He learned about saddles

He worked very fast. Galloped through his plans. Got his estimate in ahead of the field. And lost by a saddle! The saddle... that innocent-looking strip of wood between the jambs of a door... can cause a lot of trouble. When it's set back from the wall of the corridor it means cutting the carpet to fit (which is an item of expense) or sewing in a small carpet strip (which looks pretty bad). When saddles are made even with the walls, there's an unbroken stretch of carpet the length and width of the hall. This strikes the eye very agreeably. And it strikes the builder as a neat little economy. Bigelow-Sanford's contract department overflows with practical ideas such as this. That's one reason why more and more architects look to Bigelow-Sanford for floor-coverings. The other reasons are (1) unequalled variety, (2) authentic patterns and colorings, and (3) the greatest resources and facilities of any rug and carpet weavers in the world. The name of your nearest dealer will gladly be sent on request. Or present your problems direct to the contract department.

BIGELOW-SANFORD
Rugs and Carpets

Made by Bigelow-Sanford Carpet Co. Inc. Mills at Thompsonville, Conn.; Amsterdam, New York; Clinton, Mass. Main Sales Office: 385 Madison Ave., New York
Sales Offices: Boston - Philadelphia - Pittsburgh - Atlanta - Dallas - St. Louis - Chicago - Detroit - Minneapolis - Denver - Los Angeles - San Francisco - Seattle
STRIKING A MODERN NOTE IN LIGHTING

with wiring adapted to restaurant needs

by FREDERICK PUTNAM PLATT—A.I.A.
of F. P. Platt & Bro., Architects, New York, N.Y.

In the Horn & Hardart Company restaurant at 1165 Sixth Avenue, New York, light enhances the inviting atmosphere of the restaurant and provides appetizing display for food.

Uncontrollable factors necessitated the development of an unusual type of exterior illumination for this building and the decorative scheme of the interior called for a lighting plan that would take full advantage of the colors and materials used.

In such a situation, where specific questions of lighting practice are raised, proper co-operation between the architect and the lighting and wiring section of the local electric service company can be most valuable. Information about changing styles in lighting and about the use of light for both decorative and merchandising purposes helps materially in reaching a happy solution of the problems.

For the exterior illumination in this case, lighted panels are used at the sides of the window jambs. These give a pleasing effect, both day and night, while they also bathe the interior with a soft glow of light which enriches the decorative features.

Modernistic ceiling and side wall fixtures make the restaurant interior inviting. A continuous hood-light over the cafeteria and automat counters is used in the merchandising of food.

The total connected load in this restaurant is 63 K.W. for lighting and 50 H.P. for power. Every care has been taken in the wiring to provide for possible future needs of the kind that are constantly developing through the increasing use of electricity.

Attractive pendant type fixtures provide general illumination over the mezzanine wells.

Hood light illumination is used over the counters with a concealed lamp in each food compartment.

In the smaller bays a modernistic, box-type carved glass fixture is used.

For information about trends in lighting standards, and about adequate wiring, call on the Wiring Bureau of your local electric service company, or write direct.

NATIONAL ELECTRIC LIGHT ASSOCIATION, 420 LEXINGTON AVENUE, NEW YORK, N. Y.
YOU CAN DO THIS SORT OF THING WITH THE NEW SEEMINGLY SEAMLESS CARPET

There are a lot of people yet who find it hard to understand that the new Collins & Aikman Carpet actually gives a seemingly seamless appearance—at the price of ordinary narrow-width carpet with stitched seams. The idea is so unique that it hardly seems possible—until you see the proof before your eyes. That is why we are showing these photographs of actual installations—just two of the many which have been made. In homes, offices, restaurants, hotels, theaters and steamships, the new Collins & Aikman Carpet is already in service. For full information, write to Collins & Aikman Corporation, 25 Madison Ave., New York City.

This unusual circular room, completely laid with rich, black Collins & Aikman Carpet, was photographed in a beautiful home located at Cummings Point, Stamford, Conn. The new carpet comes in 54-inch widths. The resilient backing locks the pile, and allows the carpet, when cut, to form its own selvage. Strips are joined by pushing edges together and applying a tough web of strapping to the back. The thick pile meshes...the finished carpet is apparently seamless.

This photograph shows the New York office of Miss Virginia Hamill, a leading stylist. Miss Hamill made the color-design for the carpet herself, and it was laid just as she wished. The unique manner of joining strips permits any number of colors to be inlaid. To get the same effects with broadloom carpet would involve special loomings. Collins & Aikman Carpet is the only kind that can be laid in special color combinations at a price which encourages heavy sales. Our booklet explains other advantages—to dealers, decorators and consumers.
LIKE a bit of Sunny Spain transplanted in the desert at Barstow, California, Beacon Tavern sounds a new keynote in modern hotel luxury for the motorist.

First of a possible chain of thirty-two Beacon Taverns to be dotted throughout the Pacific Coast, this unusual new development combines everything the hotel guest could desire in beauty, comfort and service.

To add that sparkling touch of color— that atmosphere of distinction which only the finest of appointments can create—Blabon’s Inlaid Linoleum (Pattern No. 1129) has been installed in this delightful hostelry.

For, after all, no type of floor covering surpasses in richness and practicability America’s finest Linoleum.

BLABON-SANDURA COMPANY, INC.
FINANCE BUILDING PHILADELPHIA
BLABON’S LINOLEUM ~ ~ ~ ~ WILD’S LINOLEUM
Selected List of Manufacturers' Publications
FOR THE SERVICE OF ARCHITECTS, ENGINEERS, DECORATORS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge unless otherwise noted, by applying on your business stationery to The Architectural Forum, 521 Fifth Ave., New York, or the manufacturer direct, in which case kindly mention this publication.

ACOUSTICS

R. Guastavino Co., 40 Court Street, Boston.


Sound-Absorbing Treatment in Banks and Offices, booklet, 19 pp., 8'/4 x 11 ins. Illustrated.


ASH HOISTS

Gills & Geoghegan, Inc., 544 West Broadway, New York.

ASH HOISTS—TELESCOPIC

Gills & Geoghegan, Inc., 544 West Broadway, New York.

CONCRETE BUILDING MATERIALS

Concrete Steel Company, 2 Park Avenue, New York, N. Y.

Modern Concrete Reinforcement. Booklet, 22 pp., 8'/4 x 11 ins. Illustrated.

CONSTRUCTION, FIREPROOF


CONSTRUCTION, STONE AND TERRA COTTA

Coving Pressure Relief Joint Company, 100 North Wella St., Chicago, Ill.

Pressure Relieving Joint for Buildings of Stone, Terra Cotta or Marble. Brochure, 16 pp., 8'/4 x 11 ins. Illustrated. Deals with preventing cracks, spalls and breaks.

DOORS

David Lupton's Sons Company, Philadelphia.

Lupton Commercial Steel Doors. Folder, 8'/4 x 11 ins. Illustrated. Lupton Steel Industrial Doors. Brochure, 8 pp., 8'/4 x 11 ins. Illustrated. Details and specifications.

DOORS AND TRIM, METAL

The American Brass Company, Waterbury, Conn.

The Kawneer Company, Niles, Michigan.

The Evanston Soundproof Door. Folder, 8 pp., 8'/4 x 11 ins. Illustrated. Dealt with a valuable type of door.

DOOFSOUNDPROOF

Irving Hamlin, Evanston, Ill.

To get any of the catalogs described in this section, put down the title of the catalog desired, the name of the manufacturer and send coupon to The Architectural Forum, 521 Fifth Avenue, New York.
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 67

DUMBWA'TERS
Sedgwick Machine Works, 151 West 15th St., New York, N. Y. Catalog and Service Sheets. Standard specifications, plans and prices for various types, etc. 4½ x 8¼ ins., 40 pp. Illustrated. Catalog and pamphlets, 8½ x 11 ins. Illustrated. Valuable data on dumbwa'ters.

ELECTRICAL EQUIPMENT

The Bryant Home of Ideas. Contains data and suggestions useful in connection with residence wiring 8½ x 10 ins. 16 pp. "Re-Na-X" and "Hooks-X" Bulletin No. 312B. Contains data and specifications pertaining to devices for use in connection with the hanging of lighting fixtures, making such fixtures portable or removable, soldered joints being eliminated. 8½ x 10 ins. 6 pp.


The House of a Hundred Comforts. Booklet, 40 pp., 8 x 10½ ins. Illustrated. Dwells on importance of adequate wiring.


Equipment for Heating and Ventilating Systems. Booklet, 22 pp., 8½ x 11 ins. Illustrated. This is "Motor Application Circular 7279."


Beauty; Power; Silence; Westinghouse Fans. (Dealer Catalog 41.) Booklet, 16 pp., 8½ x 11 ins. Illustrated. Valuable information on fans and their uses.

Electric Range Book for Architects (A. L. A. Standard Classification 31-G-4). Booklet, 24 pp., 8½ x 11 ins. Illustrated. Deals with important details of machines, motors and controllers for these types.


ELEVATORS
Otis Elevator Company, 260 Eleventh Ave., New York, N. Y. Otis Push Button Controlled Elevators. Descriptive leaflets, 8½ x 11 ins. Illustrated. Full details of machines, motors and controls for these types.

Otis Geared and Gearless Traction. Elevators of All Types. Descriptive leaflets, 8½ x 11 ins. Illustrated. Full details of machines, motors and controllers for these types.


Sedgwick Machine Works, 151 West 15th St., New York, N. Y. Catalog and descriptive pamphlets, 4½ x 8¼ ins., 70 pp. Illustrated. Lists of properties for certain types of elevators, sidewalk elevators, automobile elevators, etc.

ELEVATORS—Continued.
Catalog and pamphlets, 8½ x 11 ins. Illustrated. Important data on different types of elevators.

ESCALATORS

FIREPROOFING

Concrete Steel Company, 2 Park Avenue, New York, N. Y. Economical Fireproof Floors for Suburban Buildings. Folder, 4 pp., 8½ x 11 ins. Illustrated.


Make the Facing Bear Its Share. Folder, 8½ x 11 ins. Illustrated.


Face Tile Walls, Folder, 8½ x 11 ins. Illustrated.

Meeting Every Need. Folder, 8½ x 11 ins. Illustrated.

Natico Vitrified. Folder, 8½ x 11 ins. Illustrated.

Natico Double Shell Load Bearing Tile. Folder, 8½ x 11 ins. Illustrated.

FLOODLIGHTING

FLOOR HARDENERS (CHEMICAL)
Minwax Company, 11 West 46th Street, New York, N. Y. Concrete Floor Treatments. Folder, 4 pp., 8½ x 11 ins. Illustrated.


FLOORS—STRUCTURAL


FLOORING


Linoleum Layer’s Handbook. 5 x 7 ins., 36 pp. Instructions for linoleum layers and others interested in learning most satisfactory methods of laying and taking care of linoleum.


Detailed Instructions for Handling and Laying Linoleum. Brochure, 40 pp., 3½ x 5½ ins. Illustrated.


Comparison of Tests. Folder, 8½ x 11 ins. Illustrated.

REQUEST FOR CATALOGS
To get any of the catalogs described in this section, put down the title of the catalog desired, the name of the manufacturer and send coupon to THE ARCHITECTURAL FORUM, 521 Fifth Avenue, New York.
When you are cramped for FUNDS

USE CARNEY CEMENT MORTAR

HOW MANY TIMES have you wanted to employ a certain feature on a project and found that a limited appropriation prevented its installation?

Time and again Carney Cement has helped architects out of this predicament. The very simple mixing specification of water, sand and Carney Cement, together with the unusual plasticity and workability of the mortar, greatly reduces mixing and masonry costs.

It's a good point to bear in mind with building appropriations limited as they are today. Save money with this time-tested quality material.

THE CARNEY COMPANY

District Sales Offices

CHICAGO     CINCINNATI     DETROIT     ST. LOUIS     MINNEAPOLIS

Mills: Mankato and Carney, Minn.
Cement Makers Since 1883

Carney Cement
for Brick and Tile Mortar

Specifications: 1 part Carney Cement to 3 parts sand
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS: Continued from page 68

FLOORING—Continued
Congooleum-Nairn, Inc., 190 Beigeuro Drive, Kearny, N. J.
Part III should know about Resilient Floors. A series of booklets on floors for (1) schools, (2) hospitals, (3) offices, (4) stores, (5) homes, (6) churches and Lodges, (7) apartments and hotels. Illustrated.
Sealers Treadline Tiles. Two booklets, 8 and 16 pp. Illustrated.
Goodyear Tire & Rubber Co., Inc., Akron, Ohio.
Address Structural Gypsum Corporation, Linden, N. J.
Stedman Rubber Flooring Company, South Braintree, Mass.
American Seating Co., 14 E. Jackson Blvd., Chicago, 111.
Libbey-Owens Sheet Glass Co., Toledo, Ohio.
Structural Gypsum Corporation, Linden, N. J.
William H. Lutton Company, 267 Kearney Ave., Jersey City, N. J.
P. & F. Corbin, New Britain, Conn.

FURNITURE
American Seating Co., 14 E. Jackson Blvd., Chicago, Ill.
Structural Gypsum Corporation, Linden, N. J.
Goodyear Tire & Rubber Co., Inc., Akron, Ohio.
Address Structural Gypsum Corporation, Linden, N. J.

GLASS CONSTRUCTION
Libbey-Owens Sheet Glass Co., Toledo, Ohio.
Flat Glass. Brochure, 12 pp., 55% x 8% ins. Illustrated.
GREENHOUSES
William H. Lutton Company, 267 Kearney Ave., Jersey City, N. J.

GYPSUM
Structural Gypsum Corporation, Linden, N. J.
Service Sheet No. 1. Specifications and Details of Design and Construction for Gypsum Pre-Cast Long-Span Roof. Folder, 85% x 11 ins. Illustrated. Service Sheet No. 2. Specifications and Details of Design and Construction for Gypsum Pre-Case Short-Span Roof. Folder, 85% x 11 ins. Illustrated.
Service Sheet No. 3. Specifications and Details of Design and Construction for Gypsum Fireproof Pre-Cast Floors and Cellings. Folder, 85% x 11 ins. Illustrated.
Service Sheet No. 5. Specifications and Details of Design and Construction for Gypsum Fireproof Pre-Cast Assembled Slab Roofs. Folder, 85% x 11 ins. Illustrated.

HARDWARE—Continued
Distinctive Elevator Door Hardware. Booklet, 90 pp., 9% x 11 ins. Illustrated.
Hardware for the Home. Booklet, 34 pp., 5% x 5 ins. Deals with residence hardware.
Door Closer Booklet. Brochure, 16 pp., 85% x 6 ins. Data on a valuable detail.
Garage Hardware. Booklet, 12 pp., 85% x 6 ins. Hardware intended for garage use.

HEATING EQUIPMENT
American Blower Co., 6604 Russell St., Detroit, Mich.
Heating and Ventilating Utilities. A binder containing a large number of valuable publications, each 85% x 11 ins., on these important subjects.
American Radiator Co., New York, N. Y. C.
Ideal Boilers for Oil Burning. Catalog, 56 pp., 8% x 8 scheds. Illustrated. Describes a line of Heating Boilers especially adapted to use with Oil Burners.
Ideal Arco Radiator Warmth. Brochure, 8% x 8% ins. Illustrated. Describes a central all-on-one-floor heating plant with radiators for small residences, hotels, apartments and offices.
How Shall I Heat My Home? Brochure, 36 pp., 56% x 8% ins. Illustrated. Full data on heating and hot water supply.
New American Radiator Products. Booklet, 44 pp., 5% x 74% ins. Illustrated. Complete line of heating products.

Other CATALOGS
To get any of the catalogs described in this section, put down the title of the catalog desired, the name of the manufacturer and send coupon to The Architectural Forum, 521 Fifth Avenue, New York.

REQUEST FOR CATALOGS
To get any of the catalogs described in this section, put down the title of the catalog desired, the name of the manufacturer and send coupon to The Architectural Forum, 521 Fifth Avenue, New York.
Solved the Problem of Beauty with Economy

AGAIN BEST BROS. Keene’s Cement has proved its quality and adaptability... this time in the beautiful St. Luke’s Catholic Church, Richmond Heights, Mo., near St. Louis. The problem was to find a treatment for the interior walls that would be beautiful and lasting... and economical. There were objections to brick and ordinary plaster... and decorative tile or Bedford Stone were too expensive. Then Guy Study, of Study, Farrar and Rothenheber, architects of the church, had the thought of BEST BROS. Keene’s Cement.

In writing of the successful results, Mr. Study says:

“Neither for the interior of St. Luke’s Church that would be permanent, reasonable economical and in entire sympathy with the character of the architecture. This was obtained by plastering with BEST BROS. Keene’s Cement. While this was still wet we marked off the walls with a diamond pattern and in the center of the diamonds, stamped the Greek letters Alpha and Omega and a Greek cross.

“We used a trowel perforated with these designs and merely pressed the trowel on the plaster, so that the design was a raised ornament. The crisscross diamond pattern was obtained with a sort of rake or trowel. After the plaster was thoroughly dry, we washed the entire wall with a glaze, slightly tinted.

“This simple lattice work design is the type of design common in Gothic work and it is more than probable that in many of the old churches the plaster was scratched the same way. Nearly all who have seen these walls have been tremendously struck by the beauty of this simple method of decoration.”

BEST BROS.

This newest Best Bros. Product is receiving enthusiastic favor everywhere. It needs no admixtures. Used with good aged lime-putty, it will set up fast enough for finish troweling without waiting. FAST FINISH sacrifices none of the characteristics of Best Bros. (Regular) Keene’s Cement. It produces the same durable, perfect ceilings and walls and is readily adaptable to all types of modern interior finishes and color effects. Write for further information.

BEST BROS. KEENE’S CEMENT CO.

1050 W. 2nd Avenue Medicine Lodge, Kansas

Sales Offices in: New York, Chicago, Toledo, St. Louis, San Francisco, Kansas City, Philadelphia
SELECTED LIST OF MANUFACTURERS’ PUBLICATIONS—Continued from page 70

HEATING EQUIPMENT—Continued

To et any of the catalogs described in this section, put down the title of the catalog desired, the name of the manufacturer and send coupon to The ARCHITECTURAL FORUM, Inc., 521 Fifth Avenue, New York.

Bryant Electric Co., Bridgeport, Conn.

HOSPITAL EQUIPMENT

Bryant Electric Co., Bridgeport, Conn.

HOSPITAL SIGNAL DEVICES. Bulletin HS-622-HF. Complete information on hospital signal devices. Pull Control Type. 85 x 11 ins. 46 pp.


The Frink Co., Inc., 30 Lexington Ave., New York City.

Catalog 426. 7 x 10 ins., 16 pp. A booklet illustrated with photographs and drawings, showing the types of lights for use in hospitals, as operating table reflectors, ward reflectors, bed lights and microscopc reflectors, giving sizes and dimensions, explaining their particular fitness for special uses.

The International Nickel Company, 67 Wall St., New York, N. Y.

Hospital Applications of Monel Metal. 80 x 11 ins. 16 pp. Illustrated. Gives types of equipment in which Monel Metal is used, reasons for its adoption, with sources of such equipment.

John Van Rang Co., Cincinnati, Ohio.

Practical Planning for Hospital Food Service. 62 pp., 85 x 11 ins. Illustrated.

Wilmut Castle Company, Union Trust Bldg., Rochester, N. Y.

The Hospital Sterilizer Data Sheets. Booklet, 16 pp., 85 x 11 ins. Illustrated. Data on planning sterilizer installations.

HOTEL EQUIPMENT

Pick-Bart Company, Inc., Albert, 1300 West 35th St., Chicago, Ill. 64 pp. 85 x 11 ins. Illustrated.

Some Thoughts on Furnishing a Hotel. Booklet, 75 x 9 ins. Data on complete outfitting of hotels.

INCENTRATORS


Josam-Graver Incinerators. Folder, 4 pp., 85 x 11 ins. Illustrated.


Garbage and Waste Disposal for Apartment Buildings. Folder, 85 x 11 ins., 36 pp. Illustrated. Describes principle and design of Kernorater Chimney-fed Incinerator for apartments and gives list of buildings where it has been installed.

Sanitary Disposal of Waste in Hospitals. Booklet, 4 x 9 ins., 12 pp. Illustrated. Shows how this necessary part of hospital service is taken care of with the Kernorater. Gives list of hospitals where it has been installed.

Estate Type Kernorater, for Estates and Country Homes. Booklet, 8 pp., 85 x 11 ins. Illustrated.

INSULATION


The Insulation of Roofs with Armstrong's Corkboard. Booklet. Illustrated. 75 x 109/4 ins. 22 pp. Discusses means of insulating roofs of manufacturing or commercial structures.

Insulation of Roofs to Prevent Condensation. Illustrated book lets. 75 x 109/4 ins. 36 pp. Gives full data on valuable line of roof insulation.

Filing Folder for Pipe Covering Data. Made in accordance with A. I. A. rules.
FLATTER. BRIGHTER. CLEARER
—YET NOT HIGHER PRICED

FLATTER—freer from waves and streaks and surface imperfections than window glass ever was before. Brighter—the finest, most even surface a fire-finished glass ever showed. And both sides alike—saving labor for the glazier. Yet the price—the same as that of ordinary glass! Unquestionably a vitally important development in glass-making.

Let Pennvernon speak for itself. Any Pittsburgh Plate Glass Company warehouse—they're located in all leading cities—will gladly supply samples and fill orders promptly. And read the new booklet about the revolutionizing process by which Pennvernon is made. Just write to Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Pa.

Pennvernon
flat drawn
WINDOW GLASS
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS. Continued from page 72

INSULATION—Continued

The Cork-lined House Makes a Comfortable Home. 5 x 7 ins. Illustrated.

Armstrong's Corkboard. Insulation for Walls and Roofs of Buildings. 66 pp., 8½ x 11¼ ins. Illustrates and describes use of insulation for structural purposes.


Structural Gypsum Corporation, Linden, N. J. Insulation of Gypsum. Folder 8½ x 11 ins. Illustrated.

LATH, METAL AND REINFORCING—Continued

Steeltex Data Sheet No. 2, Folder. 8 pp., 8½ x 11 ins. Illustrated. Steeltex for floors on steel joists with flat top flanges.

Steeltex Data Sheet No. 3. Folder, 8 pp., 8½ x 11 ins. Illustrated. Steeltex for folders on wood joists.


LAVATORY MACHINERY

American Laundry Machinery Co., Norwood Station, Cincinnati, O. Functions of the Hotel and Hospital Laundry. Brochure, 8 pp., 8½ x 11 ins. Valuable data regarding an important subject.


Troy Laundry Machinery Co., Inc. 9 Park Place, New York City. Laundry Machinery for Large Institutions. Loose-leaf booklet, 30 pp., 8½ x 11 ins. Illustrated.

Laundry Machinery for Small Institutions. Loose-leaf brochure, 30 pp., 8½ x 11 ins. Illustrated.


Dry Cleaning Equipment for Institutional Purposes. Brochure, 30 pp., 8½ x 11 ins. Illustrated.

LIGHTING EQUIPMENT


Celestialite Catalog 727. Booklet, 18 pp., 8½ x 11 ins. Illustrated. Valuable brochure on lighting.

Smyser-Royer Co., 1700 Walnut Street, Philadelphia, Pa. Catalog "J" on Exterior Lighting Fixtures. Brochure, illustrated, giving data on over 300 designs of standards, lanterns and brackets of bronze or cast iron.


MAIL CHUTES

Cutler Mail Chute Company, Rochester, N. Y. Cutler Mail Chute Model F. Booklet, 4 x 9½ ins., 8 pp. Illustrated.

MANTELS

Henry Klein & Co., Inc. 40-46 West 23rd Street, New York.


MARBLE

The Georgia Marble Company, Tate, Ga.; New York Office, 1328 Broadway.

Why Marble. Booklet, 9½ x 6 ins. Gives analysis, physical qualities, comparison of absorption with granite, opinion of authorities, etc.

Convincing Proof. 9½ x 6 ins., 8 pp. Classified list of buildings and memorials in which Georgia Marble is used, with names of Architects and Sculptors.

Hurt Building, Atlanta; Senior High School and Junior College, Muskogee, Okla. Booklet, 8½ x 11 ins. Illustrated.
The Whole World wants

LUSTRA GLASS

FLAT-DRAWN

Because...

It Transmits ultra-violet sun rays.

It Transmits more daylight.

It is the "whitest" of all glass made for windows.

It costs no more than ordinary window glass.

Never before has a window glass created such world-wide interest. Never before has a glass for glazing purposes offered so many advantages at any price. It is only natural that architects, builders and home buyers will not be satisfied with anything less than LUSTRA GLASS. Write for our LUSTRA GLASS BOOKLET A-430.

AMERICAN WINDOW GLASS CO.

Farmers Bank Bldg.

Pittsburgh, Pa.

Also makers of Armor-Lite Scatter-Proof and Bullet-Proof Glass, Tintaglass, Picture Glass, Photographic Dye Plate Glass, 3/4" and 3/6" Crystal Sheet, Ground and Chipped Glass, Improved Quartz-Lite and Bulb Edge Glass.
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 74

METALS
The International Nickel Company, 67 Wall St., New York, N. Y. Malleable Steel Products Catalog, containing 10 full page plates of illustrative office layouts. Valuable data on use of malleable in kitchens, laundries, etc.

MILL WORK—See also Wood
Curtis Companies Service Bureau, Clinton, Iowa. Your Dream Kitchen, Booklet, 11 pp., 7 x 10 ins. Illustrated. Fine line of fittings for kitchens, breakfast alcoves, etc.
Hartmann-Sanders Company, 2155 East Ave., Chicago, III. Column Catalog, 7 x 9 ins., 48 pp. Illustrated. Contains prices on columns 6 to 36 ins. diameter, various designs and illustrations of columns and installations.
The Pergola Catalog, 7 x 10 ins., 64 pp. Illustrated. Contains illustrations of pergola lattices, garden furniture in wood and cement, garden accessories.
A New Style in Interior Decoration. Folder, 4 pp., 6 x 9 ins. Illustrated. Deals with interior woodwork.
Roddis Doors for Hospitals. Brochure, 16 pp., 8½ x 11 ins. Illustrated work on hospital doors.
Roddis Doors for Hotels. Brochure, 16 pp., 8¼ x 11 ins. Illustrated work on doors for hotel and apartment buildings.

ORNAMENTAL PLASTER

PAINTS, STAINS, VARNISHES AND WOOD FINISHES
Medusa Portland Cement Co., Engineers' Building, Cleveland. How to Paint Concrete and Masonry Surfaces. Booklet, 16 pp., 8½ x 11 ins. Illustrated.

PARTITIONS—Continued
Hausmaner Company, E. F., Cleveland, Ohio. Malleable Steel Partitions for Sub-dividing office and industrial space with detachable partitions. Folders on complete line, 8½ x 11 ins, giving full data on space. Shows typical offices laid out with Malleable partitions, cuts of finished partition units in various woods. Gives specifications and cuts cal buildings using Malleable.
Hollow Steel Standard Partitions. Various folders, 8½ x 11 ins. Illustrated. Give full data on different types of steel partitions, together with details, elevations and specifications.

Improved Office Partition Co., 25 Grand St., Elmhurst, L. I., N. Y. (See Henry Klein & Co.)
Telesco Office Partition, 25 Grand St., Elmhurst, L. I., N. Y. (See Henry Klein & Co.)

PIPE
Clew & Sons, James B., 534 S. Franklin St., Chicago, Ill. Catalog, 7½ x 11 ins., 700 pp. Illustrated. Shows a full line of steam, gas and water works supplies.
National Tube Co., Frick Building, Pittsburgh, Pa. "National" Bulletin No. 2. Corrosion of Hot Water Pipe, 8½ x 11 ins., 24 pp. Illustrated. In this bulletin is summed up the most important research dealing with hot water systems. The text matter consists of seven investigations by authorities on this subject.
National Bulletin No. 3. The Protection of Pipe Against Internal Corrosion, 8½ x 11 ins., 20 pp. Illustrated. Discusses various causes of corrosion, and details are given of the deactivating and deaerating systems for eliminating or retarding corrosion in hot water supply lines.
"National" Bulletin No. 25. "National" Pipe in Large Buildings. 8½ x 11 ins., 38 pp. This bulletin contains 24 illustrations of prominent buildings of all types, containing "National" Pipe, and considerable engineering data of value to architects, engineers, etc.
Modern Welded Pipe. Book of 88 pp., 8½ x 11 ins., profusely illustrated with halftone and line engravings of the important operations in the manufacture of pipe.

PLASTER

REQUEST FOR CATALOGS
To get any of the catalogs described in this section, put down the title of the catalog desired, the name of the manufacturer and send coupon to THE ARCHITECTURAL FORUM, 521 Fifth Avenue, New York.
Planning a Commercial Structure?

Then Consider HOW and WHERE to USE... ART IN GLASS

Through stately windows worked in the medium of tinted glass, light pours in subdued tones to create a picture. If it be a civic structure, perhaps the picture typifies the traditions, the growth or the aspirations of the city. In like manner, banks, office buildings, hotels, hospitals, educational institutions and industrial plants can use art glass windows... With the modern trend toward beautifully appointed offices, art glass casement windows, blending with interior decorations, provide softer light and shut out disturbing views. Office effects produced by art glass lighting lift the drabness from this work-a-day world and make it a happier place in which to live....

Probably one of the most practical applications of art glass is found in skylights. Here opalescent glass transforms glare into friendly light. Or sub-tinges a rose tinge for grayness when clouds hang low without.... Art in glass is a medium in which you can work with some nearby craftsman to produce effects that place your work, large or small, in the distinguished achievements of your profession.

KOKOMO

OPALESCENT GLASS... CO.

1200 S. Market St. Kokomo, Indiana

MANUFACTURERS COLORED OPALESCENT CATHEDRAL GLASS / ROLLED ANTIQUE GLASS / MOSAIC GLASS / GLASS FOR ART PURPOSES
PLASTER—Continued

Interior Walls Everlastling. Booklet, 20 pp., 8 1/2 x 11 ins. Illustrated. Describes origin of Keene's Cement and views in which it is used.

Structural Gypsum Corporation, Linden, N. J.

Plugging Time Book. 4 pp., 8 1/2 x 11 ins. Illustrated. Contains specifications, yardage, and general instructions for using Gypsum Plasters.

PLUMBING EQUIPMENT

Chow & Sons, James B., 534 S. Franklin St., Chicago, III.

Catalog M. 272 pgs., 8 1/2 x 11 ins. Illustrated. Shows complete line of plumbing fixtures for Schools, Railroads and Industrial Plants.

Crane Company, 826 S. Michigan Ave., Chicago, Ill.

Plumbing Suggestions for Home Builders. Catalog, 3 x 6 ins., 80 pp. Illustrated.

Plumbing Suggestions for Industrial Plants. Catalog, 4 x 6 1/2 ins., 34 pp. Illustrated.

Planning the Small Bathroom. Booklet, 5 x 8 ins. Discusses planning bathrooms of small dimensions.

Duriron Company, Dayton, Ohio.

Duriron Acid, Alkali and Rust-Proof Drain Pipe and Fittings. Booklet, 8 1/4 x 11 in., 20 pp. Full details regarding a valuable form of piping.

Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, III.


Kohler Company, Kohn. Wis.

Catalog R. 322 pp., 8 1/2 x 11 ins. Illustrated. Loose-leaf catalog of complete line of plumbing fixtures and accessories.

New Beauty and Utility in Plumbing Fixtures. Booklet, 36 pp., 8 1/2 x 11 in. Illustrated. Shows well-arranged bathrooms, kitchens, etc.

Speckman Company, Wilmington, Del.

Catalog K. 150 pp., 8 1/2 x 10 1/2 ins. Illustrated. Data on showers and equipment details.

PNEUMATIC TUBE SYSTEMS


12 pp., 8 1/2 ins. Illustrated booklet of tube systems for retail stores and other buildings.

4 pp., 8 1/2 x 11 in. Data Sheet showing schematic diagrams for hotel, bank, factory and wholesale buildings, table of sizes, space requirements and preliminary layout steps. A.L.A. 35c.

PUMPS

Kewanee Private Utilities Co., 424 Franklin St., Kewanee, Ill.


Nash Engineering Company, South Norwalk, Conn.

Bulletin 23. Brochure, 6 pp., 10 1/2 x 7 3/4 ins. Illustrated in color. Devoted to Jennings Standard Centrifugal Pumps for house service, giving cylinder city water pressure to supply top stories, for circulating warm water, etc.


REFRIGERATION

The Fulton Syphon Company, Knoxville, Tenn.

Temperature Control of Refrigeration Systems. Booklet, 8 pp., 8 1/2 x 11 ins. Illustrated. DEALS with cold storage, chilling of water, etc.

REINFORCED CONCRETE—See also Construction, Concrete

Concrete Steel Company, 2 Park Avenue, New York, N. Y.

Modern Concrete Reinforcement. Booklet. 32 pp., 8 1/2 x 11 ins. Illustrated.

Kalman Steel Company, Chicago, Ill.

Building for Permanence. Booklet. 8 pp., 8 1/2 x 11 ins. Reinforced concrete products.

Truscon Steel Company, Youngstown, Ohio.

Sharpening Shavers in Reinforced Concrete Beams. Booklet, 8 1/2 x 11 in. Illustrated.

REQUEST FOR CATALOGS

To get any of the catalogs described in this section, put down the tide of the catalog desired, the name of the manufacturer and send coupon to THE ARCHITECTURAL FORUM, 521 Fifth Avenue, New York.

Name

Business

Address
LIKE MAKING TEA

IN A SALT CUP!

If we tried to make tea in a cup made of salt, a great part of the cup would dissolve rapidly into the tea and the resulting mixture would be unfit to drink.

Just so, when glass is manufactured in pots made from clay containing impurities, the impurities dissolve into the molten glass. Because impurities in glass retard the transmission of light, the greatest care must be exercised in the making of glass for illuminating globes.

To assure a minimum of impurities and maximum efficiency of light transmission, clays used in the manufacture of Macbeth illuminating glass are chosen with meticulous care. Selected from the finest deposits in Europe and America, they are analyzed, prepared and formed with the utmost skill. Some are burned at high temperatures. Others are dried for at least six months and then brought slowly to a white heat for two weeks before they are lifted . . . glowing hot . . . into the furnace . . .

Working with the finest raw materials obtainable, with the most advanced knowledge and exact skill, Macbeth illuminating engineers have made possible the high transmission efficiency peculiar to Macbeth illuminating glassware. • • • MACBETH-EVANS GLASS Company, Charleroi, Pennsylvania.

Macbeth

The same tradition of quality behind them both.
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued from page 78

SCREENS
American Brass Co., The, Waterbury, Conn.

STEEL PRODUCTS FOR BUILDING
Bethlehem Steel Company, Bethlehem, Pa.

STONE, BUILDING
Indiana Limestone Company, Bedford, Ind.

STORE FRONTS

STEEL FRAME SHELVING
Bethlehem Steel Shelving. Catalog E. Illustrated brochure, 40 pp., 8½ x 11 ins. Deals with steel cabinets, shelving, racks, doors, partitions, etc.

STEEL FRAME STANDARD GASOLINE SERVICE STATIONS

TERRA COTTA
National Terra Cotta Society, 97 West 44th St., New York, N.Y.

TILES

TRUSSES
McKewen Bros. Company, 523 South Keeler Avenue, Chicago.

VALVES
Craie Co., 636 S. Michigan Ave., Chicago, Ill.

VENETIAN BLINDS
The 70-Story - The Manhattan Company Building

One of the World's Largest

Lighted with Gleason-Tiebout's

H. Craig Severance Inc., Architects and Engineers
Yasuo Matsui, Associate Architect
Starrett Brothers and Eken, Inc., Builders
SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—Continued

VENTILATION
American Blower Co., Detroit, Mich.


Detroit Company, Dayton, Ohio.
Acid-proof Exhaust Fans. Folder, 8 x 10 1/2 ins., 8 pp. Data regarding fans for ventilation of laboratory fume hoods.

Specification Form for Acid-proof Exhaust Fans. Folder, 8 x 10 1/2 ins.

Orange Screen Company, Maplewood, N. J.
Window Ventilator. Filters the air. Folder 4 pp., 83/4 x 11 ins. Illustrated.

WATERPROOFING
Medusa Portland Cement Co., 1032 Engineers' Building, Cleveland.


Minwax Company, Inc., 11 West 42nd St., New York.

Waterproofing Stadia. Folder, 4 pp., 83/4 x 11 ins. Illustrated.

Transparent Waterproofings for All Masonry Walls and Surfaces. Folder, 4 pp., 83/4 x 11 ins. Illustrated.

Data Sheet on Membrane Waterproofing. Folder, 4 pp., 83/4 x 11 ins. Illustrated.

Toch Brothers, New York, Chicago, Los Angeles.

Architects' Specification Data. Sheets in loose leaf binder, 83/4 x 11 ins., dealing with an important line of materials.

WEATHER STRIPS
Avery Company, 605 West 69th St., Chicago, Ill.
The Only Weatherstrip with a Cloth to Metal Contact. Booklet, 16 pp., 83/4 x 11 ins. Illustrated.

Data on an important type of weather stripping.

WINDOW GLASS
Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Pa.

Pennvemon Window Glass With the New Flatter Surface. Booklet, 83/4 x 11 ins. Illustrated.

of weather stripping.

WINDO W S
William Bayley Co., 147 North Street, Springfield, Ohio.

Bayley Pivot Windows. Booklet, 24 pp., 83/4 x 11 ins. illustrated. Sections, hardware, and other details, and illustrations of installations.

Detroit Steel Products Co., 2250 E. Grand Boulevard, Detroit.


The Kawneer Company, Niles, Mich.

Circular, 83/4 x 11 with A.I.A. File No., featuring full size details and specifications of Heavy Type Sealair Independent Balanced Sash Window.

Circular, 83/4 x 11 with A.I.A. File No., featuring full size details and specifications of Light Independent Balanced Sash Sealair Windows.

Circular, 83/4 x 11 with A.I.A. File No., featuring full size details and specifications of Inswinging Sealair Sash Sealair Windows. The above to be furnished in non-ferrous metal and steel.


Lupton Pivot Sash Catalog 12-A. Booklet, 48 pp., 83/4 x 11 ins. Illustrated and describes windows suitable for manufacturing buildings.


WIND OWS, CASEMENT
Detroit Steel Products Co., 2250 E. Grand Boulevard, Detroit.


Fenestra Screen Casements. Brochure, 16 pp., 83/4 x 11 ins. Illustrated.

Decorating With Casements. Booklet, 18 pp., with inserts in color 6 x 83/4 ins. Deals with use of decorations, particularly draperies, with casement windows.


Lupton Casement of Copper Steel. Catalog C-217. Booklet, 24 pp., 83/4 x 11 ins. Illustrated brochure on casements, particularly for residences.

Lupton Heavy Casement. Detail Sheet No. 101, 4 pp., 83/4 x 11 ins. Details and specifications only.


Casement Window Hardware. Booklet, 24 pp., 83/4 x 11 ins. Illustrated. Shows typical installations, detail drawings, construction details, blueprints if desired. Describes All-Way Multifold Window Hardware.


List of Parts for Assembly. Booklet, 83/4 x 11 ins., 16 pp. Full lists of parts for different units.

WINDOW SCREENS
Detroit Steel Products Co., 2250 E. Grand Boulevard, Detroit.

Fenestra Screen Casements. Brochure, 16 pp., 83/4 x 11 ins. Illustrated.

William Bayley Co., 147 North Street, Springfield, Ohio.

Bayley Painted Windows Screened. Booklet, 8 pp., 83/4 x 11 ins. Data on screening and window ventilation.

WIND OWS, STEEL AND BRONZE
William Bayley Co., 147 North Street, Springfield, Ohio.

Bayley Steel Window Inserts. Brochures, 8 pp., 83/4 x 11 ins. Illustrated Suggestions on correct use of inserts.


A Rain-shed and Ventilator of Glass and Steel. Pamphlet, 4 pp., 83/4 x 11 ins. Deals with Pond Continuous Sash. Sawtooth Roofs, etc.


Truscon Steel Company, Youngstown, Ohio.

Draughting Room Standards. Book, 83/4 x 11 ins., 120 pages of mechanical drawings showing drafting room standards, specifications and construction details of Truscon Steel Windows, Steel Lintels, Steel Doors and Mechanical Operators.


Continuous Steel Windows and Mechanical Operators. Catalog 120. Booklet, 22 pp., 83/4 x 11 ins. Illustrated.

WOOD—See also Millwork

American Walnut. Booklet, 7 x 9 ins., 46 pp. Illustrated. A very useful and interesting little book on the use of walnut in Fine Furniture with Illustrations of pieces by the most notable furniture makers from the time of the Renaissance down to the present.

American Walnut for Interior Woodwork and Panseling. 7 x 9 ins. Illustrated. Discusses interior woodwork, giving costs, specifications of a specimen room, the different figures in Walnut wood, Walnut doors, finishes, comparative tests of physical properties and the advantages of American Walnut for woodwork.

Wood Conversion Company, Cloquet, Minn.

True Insulation for Your Present House. Brochure, 12 pp., 5 x 7 ins. Illustrated.


House Comfort that Pays for Itself. Brochure, 32 pp., 5 1/2 x 7 1/4 ins. Illustrated.

WOOD FINISH
Minwax Company, 11 West 42nd St., New York.

Color card and specification for Minwax Flat Finish. Folder, 4 pp., 83/4 x 11 ins. Illustrated. Dealt with a penetrative, preservative stain finish giving grain and soft wax effect.

REQUEST FOR CATALOGS

To get any of the catalogs described in this section, put down the title of the catalog desired, the name of the manufacturer and send coupon to THE ARCHITECTURAL FORUM, 521 Fifth Avenue, New York.
This beautiful portfolio of plates should be in the files of every architect specializing in Residences Schools Universities Hospitals —in fact wherever greenhouses are used.

32 photographs of some of the finest greenhouse layouts in the country. On the reverse side of each is a ground plan and complete description of the job.

A request on your letterhead will bring you a copy free of charge.

King Construction Company
517 Wheatfield Street
No. Tonawanda, N. Y.
Give Helpful Books for Xmas!

Freese's Perspective Projection
A new and thoroughly tested method for making perspective drawings without the use of a vanishing point. It is based on sound principles and has been successfully for many years by the author, a Los Angeles architect, and by men to whom he has taught the system. It is not merely "another book on Perspective," it is a concise and complete exposition of a simple method of making perspectives instead of theorizing them. It is based on ordinary applied geometry rather than upon the highly-involved theory of optical phenomena. The ordinary drafting board with T-square and triangles are all the equipment needed. It is simple, exact, ready comprehended, easy of execution, speedy and of universal application to any object whatsoever.

Of the forty-three pages in this book the first sixteen are a complete exhibition of the method of making perspective drawings and in all the pages are devoted to time-saving expedients and practical applications of the method of architectural subjects. The remaining pages are devoted to time-saving expedients and practical applications of the method of architectural subjects.


43 pages—9 x 12 inches. Cloth Price $1.50

Geerling's Metal Crafts in Architecture
A practical reference guide for the best examples of metal work, ancient and modern, in architecture and interior decoration. 280 photographs, diagrams and measured detail studies of many years by the author, Albert Kahn, Los Angeles, partly on his experience as a professional illustrator and as an architectural renderer. The student and craftsman will find it to be a sound and complete study of the use of colored inks.


444 pages—9 x 12—over 800 Figures Price $8.50

Gupill's Drawing with Pen and Ink
Like its companion book, "Sketching and Rendering in Pencil," this book is based partly on lectures and instructions given by the author in his classes at Pratt Institute, Brooklyn, N. Y., and partly on his experience as a professional illustrator and as an architectural renderer. The student and craftsman will find it to be a sound and complete study of the method of rendering with ink and its various techniques, even through the use of colored inks.


200 pages—9 x 12—200 Figures. Cloth Price $5.00

Geerling's Wrought Iron in Architecture
This book combines for the first time a practical discussion of craftsmanship, of what can be justly expected of the metal with economic limitations, of the inter-relationships of client and artist, and the many general principles through the use of colored inks, through outline, light and shade, free hand perspective, life drawing and architectural drawing. A textbook for the student and a reference book for those more advanced.

In addition to the text illustrations by the author, there are numerous supplementary illustrations including life drawings by H. J. Stickler, Louise Geerling, Thomas Sears, Barry Faulkner, Eugene F. Savage, sketches and renderings by Otto R. Eggers, Birch Bardette Long, Chester D. Price, Hugh Ferriss, Troy Kinney, Kenneth Nast, Frank Vincent DuMond, Albert Kahn, Otto F. Langmann, Schell Lewis, Robert A. Lockwood, C. D. Maginnis, And Smith and Charles Livingston Bull Society of Architects; Illustrations by the author are all the equipment needed. It is simple, exact, ready comprehended, easy of execution, speedy and of universal application to any object whatsoever.

Of the forty-three pages in this book the first sixteen are a complete exhibition of the method of making perspective drawings and in all the pages are devoted to time-saving expedients and practical applications of the method of architectural subjects. The remaining pages are devoted to time-saving expedients and practical applications of the method of architectural subjects.

202 pages—9 x 12—318 figures. Cloth Price $7.50

Harbeson's Study of Architectural Design
This book, which follows the method of the Beaux Arts, allows the student to study at will the underlying principles of architectural design and development and to get a great deal of instruction and design as well as much about the early American traditions and European styles. There are chapters on the use of batik hangings, tapestries, old wall papers, and the importance of metal work, 208 pages—9 x 12—Well Illustrated. Cloth Price $4.00

Architectural Forum Book Store, 521 Fifth Avenue, New York

List of Titles and Prices

<table>
<thead>
<tr>
<th>Title</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freese's Perspective Projection</td>
<td>$1.50</td>
</tr>
<tr>
<td>Drawing with Pen and Ink</td>
<td>$8.50</td>
</tr>
<tr>
<td>Sketching and Rendering in Pencil</td>
<td>$5.00</td>
</tr>
<tr>
<td>Geerling's Metal Crafts in Architecture</td>
<td>$7.50</td>
</tr>
<tr>
<td>Geerling's Wrought Iron in Architecture</td>
<td>$5.00</td>
</tr>
<tr>
<td>Clute's Treatment of Interiors</td>
<td>$7.50</td>
</tr>
<tr>
<td>The Study of Architectural Design</td>
<td>$7.50</td>
</tr>
</tbody>
</table>

Enclosed find $______ to pay for the books checked.

Name: ____________________________

Address: ____________________________

City, etc. ____________________________

202 pages—9 x 12—324 figures. Cloth. Price $7.50
TOPS on kitchen cabinets with or without sinks are being made of Formica. Unusual and attractive colors and finishes have in this way been brought into the kitchen.

No room in the small house or apartment is more important. An attractive kitchen makes any place easier to sell or rent.

There are twenty handsome Formica colors. The material does not stain with liquids; chip, crack or burn easily.

It is used also for kitchen window stools, and for dinette tables.

Any ordinary liquid will not stain it or affect the finish in any way.

Let us send you all the facts.

THE FORMICA INSULATION COMPANY
4620 Spring Grove Avenue, Cincinnati, O.
are among the structures likely to baffle if not dismay even a gasometer architecturally acceptable, and grain elevators of utility structures of many kinds is suggested by this excellent architectural treatment is abundantly proved, and forlorn. It is true that no one has yet succeeded in making designed by the Metropolitan District Commission and F. F. terrier deals with the use of Indiana limestone for such building in association, and an excellent sub-station for an elec­ trical light and power company in St. Louis designed by La Beaumé & Klein in a modified version of the "modern" style.

THE E. F. HAUSERMAN COMPANY, Cleveland. "Office Planning Studies by Hauserman." The considerable cost of space in an office building presup­poses arrangement of whatever space there is. The best possible use must be made of windows; provision must usually be made for keeping hats, coats and umbrellas; and generally at least some small storage space is required. To do this within contracted area is difficult but not impossible, as is proved by this extremely useful brochure issued by a firm specializing in the planning, manufacturing and install­ ing of partitions, the organization's work involving, quite logically, considerable study to secure the most advantageous use of what area there is. "Efficient mental work necessitates the workers' being safeguarded from disconcerting interrup­ tions and irritating annoyances. This is an accepted fact. Psychologists have proved it, repeatedly, with scientifically conducted experiments involving the reaction of hundreds of students and adult office workers of both sexes. It has been customary in the past for each tenant or business executive to figure his space requirements from the ground up, as if no one had ever attempted to solve a like problem before. This method of allocating departments has often resulted in awkward office arrangement and a waste of valuable floor space. Notwithstanding the fact that businesses differ in their needs, some similarity exists as far as dividing space is concerned. There are many frequently­used layouts and modes which may be applied to the problem of matching space to the needs of any organization as well as meeting the provision for future growth. These have been analyzed and reproduced in this book. This group of studies is presented with the thought that the principles involved may be selected to fit the needs of each specific case. In many cases the layouts may be used with little or no change. In others they will serve as suggestions and may be used with modifications."

The booklet offers a number of plans (and sometimes gives views) of single­desk offices; two­desk offices; and offices of larger extent. Certain of the chapters are entitled, "The Key to Good Planning"; "Single­Swing Doors are Best"; "Angles are Always Wrong"; "Office Sizes Made Independent of Column Centers"; "The Standard Unit of Space", "The Center Island Plan"; and "The Open Center Plan."

Useful hints are given as to the best use of light, both natural and artificial, and as to securing the most comfortable venti­ lation, and the final page says: "It has been the privilege of the Hauserman engineers to consult with hundreds of architects, contractors, builders and fact­ ory executives. In this capacity they have handled thousands of feet of partition layouts and specifications for the econom­ ical use of movable steel partitions. These are thoroughly schooled in laying out space so that it may be easily changed in size, shape and arrangement, for the best planned busi­inesses always provide for un planned changes. These people understand how to handle ventilation, light, radiators, conditions, and overhead obstructions. They are experienced in planning the equitable division of floor space so that doors, ventilators and transoms are properly located.

PORTLAND CEMENT ASSOCIATION, Chicago. "Monolithic Buildings." Some suggestions on constructing them. The word "monolithic" is itself descriptive as meaning "one stone," and this is literally accomplished when a wall or a building of concrete hardens into one solid substance. But building in this manner, and architecturally acceptable, and grain elevators of utility structures of many kinds is suggested by this excellent architectural treatment is abundantly proved, and forlorn. It is true that no one has yet succeeded in making designed by the Metropolitan District Commission and F. F. terrier deals with the use of Indiana limestone for such building in association, and an excellent sub-station for an elec­ trical light and power company in St. Louis designed by La Beaumé & Klein in a modified version of the "modern" style.

THE GOODYEAR TIRE & RUBBER COMPANY, Inc., Akron, O., and Los Angeles. "Homes with Beautiful Floors." Many of the most excellent of the various advertising booklets and brochures which reach THE FORUM's office are those issued by the makers of flooring materials of differ­ent kinds, their excellence being due to beauty of pro­duction, clarity of data given, and several other qualities likely to interest architects and interior decorators. One of these brochures is among the best of its kind, giving as it does all requisite data regarding the rubber flooring pro­duced by this old and well known firm, and suggesting its proper use in domestic buildings by numerous beautiful illustrations of interiors of several of the architectural styles.

LUDOWICI-CELADON COMPANY, New York, Chicago, Washington, "Domestic Architecture in Surrey and Sussex." The series of monographs being issued bi-monthly under the title of "The Tulleries Brochures" are intended, first of all, to further the use by architects and builders of the excellent roofing tile made by these well known manufactur­ers. The first of these brochures was issued in July, 1930, deals with "Some Domestic Architecture in Surrey and Sussex," the text having been prepared by W. Pope Barney, while the illustrations are from photographs by the well known British architect, F. R. Yerbury. These illustrations show a number of the fine old domestic buildings which are found even yet in these two English shires, their color and detail from time even their managers and fac­tory executives. In this capacity they have handled thousands of feet of partition layouts and specifications for the econom­ical use of movable steel partitions. These are thoroughly schooled in laying out space so that it may be easily changed in size, shape and arrangement, for the best planned busi­nesses always provide for un planned changes. These people understand how to handle ventilation, light, radiators, conditions, and overhead obstructions. They are experienced in planning the equitable division of floor space so that doors, ventilators and transoms are properly located."

REVIEWS OF MANUFACTURERS' PUBLICATIONS

WHOLE SUNLIGHT—TO LIVE WITH

When you are planning sun-windows—whether for homes, hospitals, sanitariums or schools—go a step farther than designing beautiful windows. Make them windows that will let in whole sunlight—sunlight that includes those priceless, health-bearing, vital ultra-violet rays—rays which ordinary glass actually blots out. Specify Helioglass. It not only brings in those precious rays in generous measure—but will do so permanently. It makes windows to live with!

Our Architectural Representative will be glad to tell you more about Helioglass—another product sponsored by the large organization whose service in the fields of plate, window and structural glass you are already familiar with. And Helioglass is conveniently available at our branch warehouses in all leading cities.

PITTSBURGH PLATE GLASS COMPANY
PITTSBURGH, PA.

HELIOGGLASS
ULTRA-VIOLET RAY GLASS
INDIANA LIMESTONE COMPANY, Bedford, Ind. "Limestone for Sculpture, Carving and Finishes."

The various booklets and brochures issued by the Indiana Limestone Company are among the most interesting and valuable which reach the desk of THE FORUM's reviewer of manufacturers' publications. This widely known firm operates at some 20 quarries from which there are obtained varieties of limestone which by reason of their colors or textures are appropriate for many different uses, and with reference to each use the firm issues publications which are richly illustrated and full of valuable data. This particular booklet has to do with limestone when used for architectural sculpture and finishes. Among the illustrations are those of many important examples of such sculpture, used for the exteriors or interiors of buildings, several being parts of the new British Embassy building in Washington. A number of pages show different forms of rustication, a type of ornament for which Indiana limestone is particularly well adapted.

MEDUSA PORTLAND CEMENT COMPANY, Cleveland. "Gray Portland Cement—Waterproofed."

A valuable booklet lately issued by this well known firm deals with the making of cement which is waterproof. This waterproof cement is made by the Medusa process, which consists of grinding in Medusa waterproofing with the cement before it goes to the mill during the manufacture of the cement. The issuing of this brochure marks the 20th year of the successful use of this product in the building material field. Several interesting details are brought out in the booklet. There is a graphic test showing the advantages of the use of waterproofed cement. The subject of why concrete and mortar should be waterproofed is thoroughly dealt with, as is also the advantage of mill-mixed waterproofed cement over the use of mixtures made at the site. It gives complete specifications and details for the making of a good, permanent, waterproofed concrete. It tells how to waterproof concrete and masonry both above and below grade, and it gives the specifications and use for waterproofed mortars. Other interesting details in the booklet include specifications for waterproofed concrete blocks, for waterproofing existing work, waterproofing in home construction, mercantile buildings, factories, swimming pools, etc. The brochure is profusely illustrated and is a valuable guide for anyone interested in making good waterproofed concrete for any use.

CLINTON METALLIC PAINT COMPANY, Clinton, N. Y. "The Importance of Color of Mortar in Architecture."

One tendency in present-day architecture is toward economy of ornament. In tall buildings, such as office and loft buildings, apartment houses and hotels, the cornice with or without a supporting frieze has almost completely disappeared, and gone likewise are the garlands, cartouches and other devices with which until a few years ago architects were fond of embellishing their buildings. This does not mean that ornament is no longer used, but that now the ornament is what might be termed "structural"—secured usually by use of the building material in ways which are sufficiently tasteful to give grace and dignity to the structure without using any form of applied ornament. It is quite possible that brick is being used more extensively today than at any time in the world's history. Even the tall est building must be enclosed, even though the enclosing walls support nothing—not even themselves—and this involves vast areas of wall which are often of brick, and to give architectural character to these great expanses, often without even windows, is to give ornament which is part of the structure itself. Character in brickwork can be secured in several ways, one by using an attractive bond, and another by using an appropriate mortar joint, giving the mortar itself a color which affords a pleasing contrast with the brick. This folder deals with the mortar colors made and sold by the Clinton Metallic Paint Company, materials possessed of a uniformity which has seldom been pointed out in these pages. In addition to giving valuable data on the use of these colors, the folder makes many suggestions.


Use of clay tile in structural work is of course a matter of great interest to architects, engineers and builders. This valuable booklet deals quite fully with the subject as it relates to the building of exteriors and interiors of buildings, and sets forth the advantages of using the material because of its strength and minimum weight and because of its insulating, fire-safe, and sound-proofing qualities.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y. "Arc Welding Structural Steel."

The growing use of arc welding in erecting the steel construction of buildings means a vast reduction in the amount of noise which distracts the inhabitants of so many American cities. In this booklet, one of several issued by the General Electric Company dealing with the use of arc welding for different purposes, the matter of arc welding construction is covered quite fully. The various advantages of arc welding are set forth, and descriptions are given of the different types of welding—both gas and arc.

Regarding the relation of building codes to arc welding, the brochure has this to say: "The revision of building codes and the preparation of specifications for welded buildings are highly important matters. Much thought and attention have been given to them at the present time. Many municipalities and engineers have formally recognized metal arc welding as worthy of consideration wherever structural steel is to be fabricated, either in the shop or in the field. The American Welding Society has published its 1928 Code. Copies of this code may be had from the Society. The Pacific Coast Building Officials' Conference has included in its 'Uniform Building Code,' Section 2710, the authority to use arc welding. This code also sets forth the essential elements required by engineers and architects for working out designs of welded joints in steel beams and columns used for building construction. The unit stresses as given in this code are to be changed in the near future to agree with those given in the code of the American Welding Society. Over 50 cities have adopted the code of the Pacific Coast Building Officials' Conference. These cities are listed in the appendix at the end of this publication; and, as will be gathered from the two lists of cities following in the appendix, it appears that, under reasonable supervision, arc welding is an acceptable means of construction in other localities. The Pennsylvania legislature has recently passed a new law which permits welded construction to be used in cities of the first class. As this law is applicable only to cities of the first class, municipalities below that grade are free to adopt their own codes. This is a good indication that an increase in the use of arc welding in the construction of buildings may be expected in the near future."

Archer-Hobart Building, 13th and Broad streets, Columbus, Ohio. This building was constructed of welded steel, and the work was done by the American Bridge Company. The steel used in this structure is made by the U. S. Steel Company. It is approximately 150 feet high and contains 450 tons of steel. Steam boilers, coal bunkers, and various other accessories of considerable weight incidental to a plant of this kind are supported by the frame-work."

88
CONSTANT USE CANNOT DIM THE LUSTRE
OF BAKELITE MOLDED DOOR KNOBS

On doors that are opened and closed every minute of the day, Bakelite Molded door knobs do not get shabby. Constant use merely keeps the smooth, hard surface bright as new. There is no lacquer or plating to wear off or peel, and they do not stain or tarnish. They are solid, very strong, and the color is in the material—not just on the outside.

Bakelite Molded door knobs are furnished in standard sizes with, or without, roses and key escutcheons. Several finishes and colors are always available, including burled walnut, jet black and dull black, but others may be had when desired. Write to us for full particulars and to see samples.

BAKELITE CORPORATION, 247 Park Ave., New York. CHICAGO OFFICE, 635 West 22nd St.
BAKELITE CORPORATION OF CANADA, LIMITED, 163 Dufferin Street, Toronto, Ontario
**INDEX TO ADVERTISING ANNOUNCEMENTS**

### Part 1—Architectural Design

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Company of America</td>
<td>12, 13, 14</td>
</tr>
<tr>
<td>American Brass Company</td>
<td>9</td>
</tr>
<tr>
<td>American Car and Foundry Company</td>
<td>41</td>
</tr>
<tr>
<td>American Walnut Manufacturers Association</td>
<td>44</td>
</tr>
<tr>
<td>American Window Glass Company</td>
<td>23</td>
</tr>
<tr>
<td>Architectural and Allied Arts Exposition</td>
<td>22</td>
</tr>
<tr>
<td>Arkansas Oak Flooring Co</td>
<td>53</td>
</tr>
<tr>
<td>Circle A Products Corporation</td>
<td>26</td>
</tr>
<tr>
<td>Carney Company, The</td>
<td>69</td>
</tr>
<tr>
<td>Bakelite Corporation</td>
<td>89</td>
</tr>
<tr>
<td>Curtis Companies Service Bureau, The</td>
<td>52</td>
</tr>
<tr>
<td>Corbin, P. &amp; F</td>
<td>36</td>
</tr>
<tr>
<td>Collins &amp; Aikman Corporation</td>
<td>65</td>
</tr>
<tr>
<td>Chicago Mill &amp; Lumber Corporation</td>
<td>54</td>
</tr>
<tr>
<td>Blank &amp; Company, Frederick</td>
<td>46</td>
</tr>
<tr>
<td>Blabon-Sandura Company</td>
<td>66</td>
</tr>
<tr>
<td>Bigelow-Sanford Carpet Company</td>
<td>63</td>
</tr>
<tr>
<td>Duriron Company, The</td>
<td>154</td>
</tr>
<tr>
<td>Compound &amp; Pyrono Door Company, The</td>
<td>154</td>
</tr>
<tr>
<td>Castle Co., Wilmot</td>
<td>140</td>
</tr>
<tr>
<td>Columbia Mills, Inc., The</td>
<td>30</td>
</tr>
<tr>
<td>Computer &amp; Data Equipment Corporation</td>
<td>48</td>
</tr>
<tr>
<td>Curtis Companies Service Bureau, The</td>
<td>52</td>
</tr>
<tr>
<td>DeLong Furniture Co</td>
<td>47</td>
</tr>
<tr>
<td>Du Pont de Nemours &amp; Co., Inc.</td>
<td>23</td>
</tr>
<tr>
<td>Eagle-Picher Lead Company</td>
<td>3</td>
</tr>
<tr>
<td>Federal Cement Tile Company</td>
<td>6</td>
</tr>
<tr>
<td>Flint FAience &amp; Tile Company</td>
<td>50</td>
</tr>
<tr>
<td>Formica Insulation Company, The</td>
<td>85</td>
</tr>
<tr>
<td>General Bronze Corporation</td>
<td>34</td>
</tr>
<tr>
<td>Georgia Mache Company</td>
<td>81</td>
</tr>
<tr>
<td>Goodyear</td>
<td>61</td>
</tr>
<tr>
<td>Gustavino &amp; Co., R.</td>
<td>29</td>
</tr>
<tr>
<td>Hanley Company, Inc.</td>
<td>1</td>
</tr>
<tr>
<td>Hartmann Sanders Co</td>
<td>52</td>
</tr>
<tr>
<td>Houseman Co., The R. F.</td>
<td>7</td>
</tr>
<tr>
<td>Heinz Tile Roofing Co., The</td>
<td>21</td>
</tr>
<tr>
<td>Higgins &amp; Co., Charles M.</td>
<td>56</td>
</tr>
<tr>
<td>Hook Company, B. Millin</td>
<td>8</td>
</tr>
<tr>
<td>Indiana Limestone Company</td>
<td>18</td>
</tr>
<tr>
<td>Johnson &amp; Faulkner</td>
<td>43</td>
</tr>
<tr>
<td>King Construction Company</td>
<td>83</td>
</tr>
<tr>
<td>Kittinger Company</td>
<td>45</td>
</tr>
<tr>
<td>Klein &amp; Co., Inc., Henry</td>
<td>77</td>
</tr>
<tr>
<td>Kolpak Opalescent Glass Co.</td>
<td>42</td>
</tr>
<tr>
<td>Long-Bell Lumber Co., The</td>
<td>74</td>
</tr>
<tr>
<td>Ludowici-Celadon Company</td>
<td>54</td>
</tr>
<tr>
<td>LuPort's Sons Co., David</td>
<td>58</td>
</tr>
<tr>
<td>Macbeth-Reynolds Glass Co.</td>
<td>79</td>
</tr>
<tr>
<td>McKewon Bros. Co.</td>
<td>62</td>
</tr>
<tr>
<td>Nashville Hdw. Flooring Co.</td>
<td>53</td>
</tr>
<tr>
<td>National Electric Light Association</td>
<td>64</td>
</tr>
<tr>
<td>National Lead Company</td>
<td>50</td>
</tr>
<tr>
<td>National Terra Cotta Society</td>
<td>65</td>
</tr>
<tr>
<td>Newcomb Mfg. Co., F. J.</td>
<td>48</td>
</tr>
<tr>
<td>Northwestern Terra Cotta Company</td>
<td>5</td>
</tr>
<tr>
<td>Orange Screen Company</td>
<td>58</td>
</tr>
<tr>
<td>Parler Works, The C.</td>
<td>19</td>
</tr>
<tr>
<td>Pittsburgh Plate Glass Co.</td>
<td>73, 87</td>
</tr>
<tr>
<td>Portland Cement Association</td>
<td>49</td>
</tr>
<tr>
<td>Randoph</td>
<td>48</td>
</tr>
<tr>
<td>Reeves Company, Robert C.</td>
<td>39</td>
</tr>
<tr>
<td>Rising and Nelson Slate Company</td>
<td>57</td>
</tr>
<tr>
<td>Roodie Lumber &amp; Verner Co.</td>
<td>37</td>
</tr>
<tr>
<td>Russell &amp; Erwin Mfg. Co.</td>
<td>2nd Cover</td>
</tr>
<tr>
<td>Sargent &amp; Company</td>
<td>10</td>
</tr>
<tr>
<td>Sheldon Slate Co., F. C.</td>
<td>2</td>
</tr>
<tr>
<td>Snowser-Royer Company</td>
<td>55</td>
</tr>
<tr>
<td>Soss Manufacturing Company</td>
<td>60</td>
</tr>
<tr>
<td>Southern Cypress Manufacturers' Association</td>
<td>49</td>
</tr>
<tr>
<td>Stedman Rubber Flooring Company</td>
<td>59</td>
</tr>
<tr>
<td>Todhunter, Inc.</td>
<td>48</td>
</tr>
<tr>
<td>United Metal Products Co.</td>
<td>54</td>
</tr>
<tr>
<td>Ward Leonard Electric Co.</td>
<td>56</td>
</tr>
<tr>
<td>Weir Co., Inc.</td>
<td>56</td>
</tr>
<tr>
<td>Western Pipe Manufacturing Co.</td>
<td>52</td>
</tr>
<tr>
<td>Westinghouse Electric Elevator Company</td>
<td>91</td>
</tr>
<tr>
<td>Westinghouse Lamp Company</td>
<td>91</td>
</tr>
<tr>
<td>Wilson Corporation, The J. G., Third Cover</td>
<td>54</td>
</tr>
<tr>
<td>Wright Rubber Products Co.</td>
<td>54</td>
</tr>
<tr>
<td>Zonri Company, The</td>
<td>15</td>
</tr>
</tbody>
</table>

### Part 2—Architectural Engineering and Business

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allerene Stone Company</td>
<td>115</td>
</tr>
<tr>
<td>Aluminum Company of America</td>
<td>103</td>
</tr>
<tr>
<td>American Brass Company, The</td>
<td>123</td>
</tr>
<tr>
<td>American Institute of Steel Construction, Inc.</td>
<td>130</td>
</tr>
<tr>
<td>American Laundry Machinery Co., The</td>
<td>175</td>
</tr>
<tr>
<td>American Radiator Company</td>
<td>175</td>
</tr>
<tr>
<td>American Rolling Mill Company, The</td>
<td>159</td>
</tr>
<tr>
<td>American Telephone &amp; Telegraph Co.</td>
<td>199</td>
</tr>
<tr>
<td>Armstrong Cork</td>
<td>171</td>
</tr>
<tr>
<td>Automatic Electric, Inc.</td>
<td>183</td>
</tr>
<tr>
<td>Brownell Company, The</td>
<td>160</td>
</tr>
<tr>
<td>Bryant Electric Company, The</td>
<td>147</td>
</tr>
<tr>
<td>Carbonized Machine Co., The</td>
<td>177</td>
</tr>
<tr>
<td>Carnegie Steel Company</td>
<td>158</td>
</tr>
<tr>
<td>Castle Co., Wilmot</td>
<td>140</td>
</tr>
<tr>
<td>Chow &amp; Sons, James H.</td>
<td>144</td>
</tr>
<tr>
<td>Compound &amp; Fenno Door Company, The</td>
<td>154</td>
</tr>
<tr>
<td>Concrete Engineering Company</td>
<td>152</td>
</tr>
<tr>
<td>Concrete Steel Co.</td>
<td>161</td>
</tr>
<tr>
<td>Connecticut Telephone &amp; Electric Corporation</td>
<td>174</td>
</tr>
<tr>
<td>Cork Import Corporation</td>
<td>130</td>
</tr>
<tr>
<td>Coving Pressure Relieving Joint Co.</td>
<td>130</td>
</tr>
<tr>
<td>Cullin Company</td>
<td>121</td>
</tr>
<tr>
<td>Cutter Mail Chat Co., The</td>
<td>131</td>
</tr>
<tr>
<td>D. G. C. Trap &amp; Valve Co.</td>
<td>118</td>
</tr>
<tr>
<td>Dunham Co., C. A.</td>
<td>154</td>
</tr>
<tr>
<td>Durston Company, The</td>
<td>173</td>
</tr>
<tr>
<td>Electric Storage Battery Company, The</td>
<td>103</td>
</tr>
<tr>
<td>Elevator Supplies Company, Inc.</td>
<td>113</td>
</tr>
<tr>
<td>Fichter Boiler Company, Inc.</td>
<td>158</td>
</tr>
<tr>
<td>Fulton Stycphon Company, The</td>
<td>173</td>
</tr>
<tr>
<td>G &amp; G Atlas Systems, Inc.</td>
<td>105</td>
</tr>
<tr>
<td>Graybar Electric Co.</td>
<td>96</td>
</tr>
<tr>
<td>Hamlin, Irving</td>
<td>154</td>
</tr>
<tr>
<td>Hardinge Bros., Inc.</td>
<td>157</td>
</tr>
<tr>
<td>Hazard Invented Wire Works</td>
<td>164</td>
</tr>
<tr>
<td>Heating &amp; Ventilating</td>
<td>128</td>
</tr>
<tr>
<td>Heuge-Simples Boiler Co., The</td>
<td>154</td>
</tr>
<tr>
<td>Hoffman Specialty Company, Inc.</td>
<td>186</td>
</tr>
<tr>
<td>Hoffrahn &amp; Billings Mfg. Co.</td>
<td>140</td>
</tr>
<tr>
<td>Imperial Brass Mfg. Co., The</td>
<td>140</td>
</tr>
<tr>
<td>International Nickel Company, The</td>
<td>122, 146</td>
</tr>
<tr>
<td>Jenkins Bros.</td>
<td>149</td>
</tr>
<tr>
<td>Johnson Service Company</td>
<td>149</td>
</tr>
<tr>
<td>Johnson Co., S. T.</td>
<td>181</td>
</tr>
<tr>
<td>Josam Manufacturing Company</td>
<td>135</td>
</tr>
<tr>
<td>Kalman Steel Company</td>
<td>151</td>
</tr>
<tr>
<td>Kernew Boiler Corporation Co.</td>
<td>152</td>
</tr>
<tr>
<td>Kewene Private Utilities Co.</td>
<td>136</td>
</tr>
<tr>
<td>Kinser Mfg. Co.</td>
<td>100</td>
</tr>
<tr>
<td>Knight, Maurice</td>
<td>142</td>
</tr>
<tr>
<td>Kohler Co.</td>
<td>139</td>
</tr>
<tr>
<td>Lamson Co., The</td>
<td>148</td>
</tr>
<tr>
<td>Lincoln Electric Co., The</td>
<td>98, 163</td>
</tr>
<tr>
<td>Louisville Cement Company</td>
<td>127</td>
</tr>
<tr>
<td>Malquist Radiator Corporation</td>
<td>130</td>
</tr>
<tr>
<td>Medina Portland Cement Company</td>
<td>154</td>
</tr>
<tr>
<td>Miller Steel Company</td>
<td>151</td>
</tr>
<tr>
<td>Minors Inc., Inc.</td>
<td>109</td>
</tr>
<tr>
<td>Modine Manufacturing Company</td>
<td>156</td>
</tr>
<tr>
<td>Mueller Co.</td>
<td>135</td>
</tr>
<tr>
<td>Naiicrete Corporation, The</td>
<td>152</td>
</tr>
<tr>
<td>Nash Engineering Co., The</td>
<td>191, 162</td>
</tr>
<tr>
<td>National Radiator Corporation</td>
<td>117</td>
</tr>
<tr>
<td>National Tube Company</td>
<td>120</td>
</tr>
<tr>
<td>Nelson Corporation, The Herman</td>
<td>111, 112, 129</td>
</tr>
<tr>
<td>Otis Elevator Company</td>
<td>142</td>
</tr>
<tr>
<td>Peacock Paint Company</td>
<td>156</td>
</tr>
<tr>
<td>Peerless Unit Ventilation Co., Inc.</td>
<td>161</td>
</tr>
<tr>
<td>Pierce, Butler &amp; Pierce Mfg. Co.</td>
<td>140</td>
</tr>
<tr>
<td>Radio Receptor Co., Inc.</td>
<td>100</td>
</tr>
<tr>
<td>Raymond Concrete Pile Company</td>
<td>95</td>
</tr>
<tr>
<td>Reading Iron Company</td>
<td>136</td>
</tr>
<tr>
<td>Republic Steel Corporation</td>
<td>163, 186</td>
</tr>
<tr>
<td>Richards Wilcox Mfg. Co., Second Cover</td>
<td>146</td>
</tr>
<tr>
<td>Roberson Co., The</td>
<td>150</td>
</tr>
<tr>
<td>Sarco Co., Inc.</td>
<td>194</td>
</tr>
<tr>
<td>Sedgwick Machine Works</td>
<td>142</td>
</tr>
<tr>
<td>Seckman Company</td>
<td>143</td>
</tr>
<tr>
<td>Steel Frame House Company</td>
<td>157</td>
</tr>
<tr>
<td>Sterling Engineering Company</td>
<td>138</td>
</tr>
<tr>
<td>Sturtevant Company, B. F.</td>
<td>184</td>
</tr>
<tr>
<td>Toch Brothers</td>
<td>156</td>
</tr>
<tr>
<td>Troy Laundry Machinery Co., Inc.</td>
<td>179</td>
</tr>
<tr>
<td>United States Gypsum Company</td>
<td>123</td>
</tr>
<tr>
<td>Van Range Co., The John</td>
<td>114</td>
</tr>
<tr>
<td>Vogel Company, Joseph A.</td>
<td>94</td>
</tr>
<tr>
<td>Voeppe Hardware Co.</td>
<td>150</td>
</tr>
<tr>
<td>Walworth Company</td>
<td>107</td>
</tr>
<tr>
<td>Warren Webster &amp; Company</td>
<td>109</td>
</tr>
<tr>
<td>Westinghouse Electric &amp; Mfg. Co.</td>
<td>126</td>
</tr>
<tr>
<td>Westinghouse Traction Brake Co.</td>
<td>185</td>
</tr>
<tr>
<td>Wood Engineering Co., Gar. Association</td>
<td>145</td>
</tr>
<tr>
<td>York Ice Machinery Corporation</td>
<td>116</td>
</tr>
</tbody>
</table>
Modern lighting keeps your buildings out of the Twilight Zone

TWILIGHT zone illumination may throw your buildings into the twilight zone of usefulness . . . the twilight zone of profits . . . the twilight zone of owner satisfaction . . . for twilight zone lighting fosters inefficiency. It is so deceiving . . . this partial darkness that retains the hampering qualities of total darkness while it masquerades as helpful light.

Modern standards of lighting adequacy recognize the part light plays in making every building serve its purpose better . . . in making possible the greater appreciation of a building's artistic merits. Keep your buildings out of the twilight zone with modern lighting.

Westinghouse lighting specialists can serve architects and their clients, they help to plan lighting installations that meet today's requirements and make it easy to adopt higher standards in keeping with future lighting progress.

The way out of the Twilight Zone

Architects and engineers who are interested in using light effectively should have a copy of the new, illustrated book, "The Way Out of the Twilight Zone." Address your request to the Westinghouse Lamp Company, Department 203, 150 Broadway, New York, N. Y.

On MAZDA Avenue
In the Westinghouse Lighting Institute actual installations scientifically demonstrate every type of modern lighting —
Open to visitors
Daily 9 to 5 — Saturday 9 to 12
7th Floor, Grand Central Palace,
New York City
— around the corner from your hotel

*The deceptive half-light between obvious darkness and adequate illumination.

Westinghouse Lighting Specialists will help you in planning effective lighting installations
Architects Recognize the Superiority of LIBBEY-OWENS-FORD GLASS because of its Permanent Lustre, True Flatness and Crystal Clearness

Over a period of many years—in fact, ever since the perfection of the exclusive Libbey-Owens-Ford flat-drawing process—architects have learned to depend upon Libbey-Owens-Ford Glass. For—in the basic qualities that every architect knows are absolutely essential—Libbey-Owens-Ford Glass has always excelled.

It is truly flat because it is drawn flat. Its brilliant, sparkling lustre is an inherent feature of the exclusive Libbey-Owens-Ford process of manufacture. The fire-finish it possesses is permanent. And it always affords crystal-clear vision.

If you are not already a consistent Libbey-Owens-Ford user, write it into the specifications for your next building. Insist upon Libbey-Owens-Ford “A” quality flat-drawn clear sheet glass. Each light is inspected and reinspected to insure uniform high quality, and it is paper packed to protect its brilliant, sparkling lustre. The familiar L.O.F label appears on each light for your identification and protection against substitution.

LIBBEY·OWENS·FORD GLASS COMPANY
TOLEDO, OHIO
Manufacturers also of Polished Plate Glass and Shatter-proof Safety Glass

TUNE IN! FLOYD GIBBONS—Libbey-Owens-Ford Radio Program—Sunday Evenings at 9:30 E.S.T.—over WJZ and Associated N.B.C. stations
What Good are Cloak Rooms Anyway?

The old-fashioned cloakroom has served its purpose, for the most part in demonstrating the useless construction expense attached to a separate walled-in enclosure, its unsanitary characteristics and as an obstacle in the path of educational efficiency.

Wilson Hygienic Wardrobes become an integral part of the class room, but without undesirable encroachment on valuable floor space.

In the Disappearing Door type, the doors, when open, protrude but 2 1/2 inches into aisle space, folding easily and nearly to the sides of the individual cabinets.

They may be set against the wall or be installed in a convenient recess.

They can be made to conform to any special interior finish, the upper parts of the doors provided with blackboard surface that meets with no interference from clothes inside.

Wilson Hygienic Wardrobes can be connected to the ventilating system, providing hygienic conditions.

They are constantly under the teacher's eye, promoting discipline.

Besides these advantages, they conserve construction funds, saving, for example, $120 to $187 in a room 20' x 22' x 12'.

Wilson Wardrobes are made by pioneers in this field, proving their superiority during 50 years of service. They are installed under our own supervision and are guaranteed for one year.

For full details as to advantages, descriptions, etc., including the Wilson Rolling Front type for small schools with limited construction appropriation, send for catalog No. 3.

The J. G. Wilson Corporation
11 East 38th Street
New York City
Offices in all principal cities
Also Manufacturers of Sectionfold and Rolling Partitions

Over Fifty Years in Business
This new building is the advanced conception of hotel accommodation—where automobiles also receive efficient, orderly care. The famous "precision landings" of Westinghouse Electric Elevators are as essential in modern garage operation as in passenger transportation—permitting heavy or light loads to roll smoothly on or off. The elevators in the Harrison-Wabash Building are high speed—full automatic control—the highest type in this class of fine elevators.

Westinghouse Elevators
Are the Logical Highways of Modern Architecture

Westinghouse Electric Elevator Company