THE ARCHITECTURAL FORUM

IN TWO PARTS

ARCHITECTURAL ENGINEERING & BUSINESS

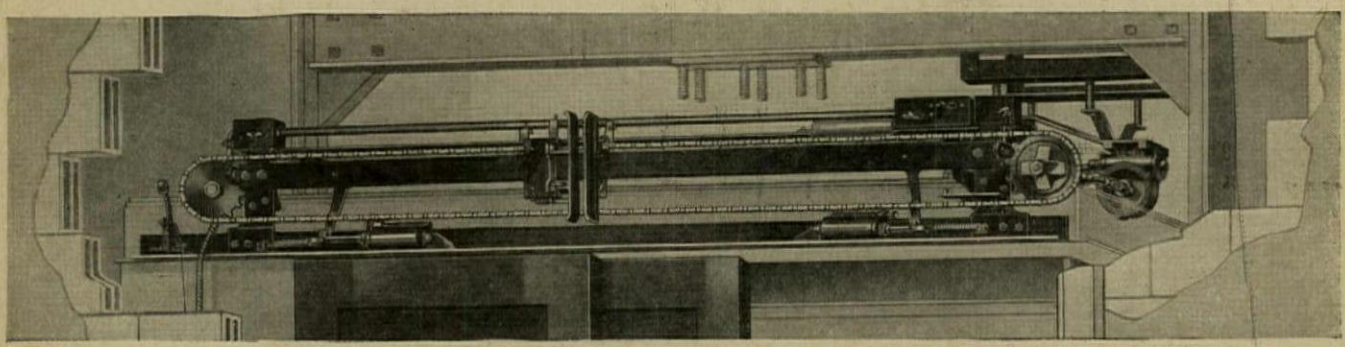
PART TWO

DECEMBER

1929

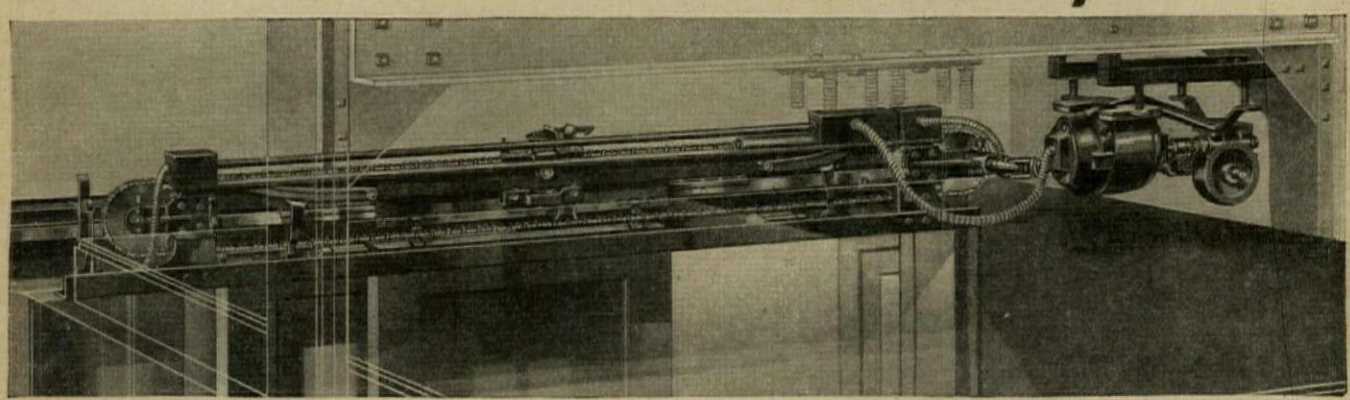
HOTEL REFERENCE NUMBER
PRICE $3

OPERATE ELEVATOR DOORS *electrically*



Elevation looking toward the cab from corridor side, with top of doorway and hangers cut away to allow a clear view of the operating machine.

The only proven electric method is PowR-Way



View looking toward the corridor doors from the top of the cab, showing motor drive unit suspended from elevator cross beams and operating machine mounted on top of cab just above the entrance.

Speed, Safety and Economy

PowR-Way possesses all these virtues. It opens and closes elevator doors speedily, smoothly, quietly, *by electricity*. The speed, while constant and invariable, may be regulated.

With PowR-Way, the car can move only when all doors in the shaft are fully closed. One switch for the entire shaft, instead of a switch at every opening, unfailingly controls this simplified interlocking mechanism. The "master switch" itself is an engineering triumph, operating by gravity alone.

PowR-Way equipment requires *no clearance space* behind doors. This space-saving feature alone brings unprecedented savings in rentable floor space. The additional speed of PowR-Way elevator service reduces the number of cars required in large buildings . . . further savings in space, equipment, installation, operation and maintenance.

Every elevator door requirement is met by R-W equipment; Hangers, closers, checks, interlocks, electric operation AND SIGNAL SYSTEMS OF ALL MODERN TYPES. ***Send for catalog.***

RICHARDS-WILCOX R·W AURORA TRADE MARK

"Quality leaves its imprint"

Richards-Wilcox Mfg. Co.

"A Hanger for any Door that Slides"

New York . . . . AURORA, ILLINOIS, U.S.A. . . . . Chicago

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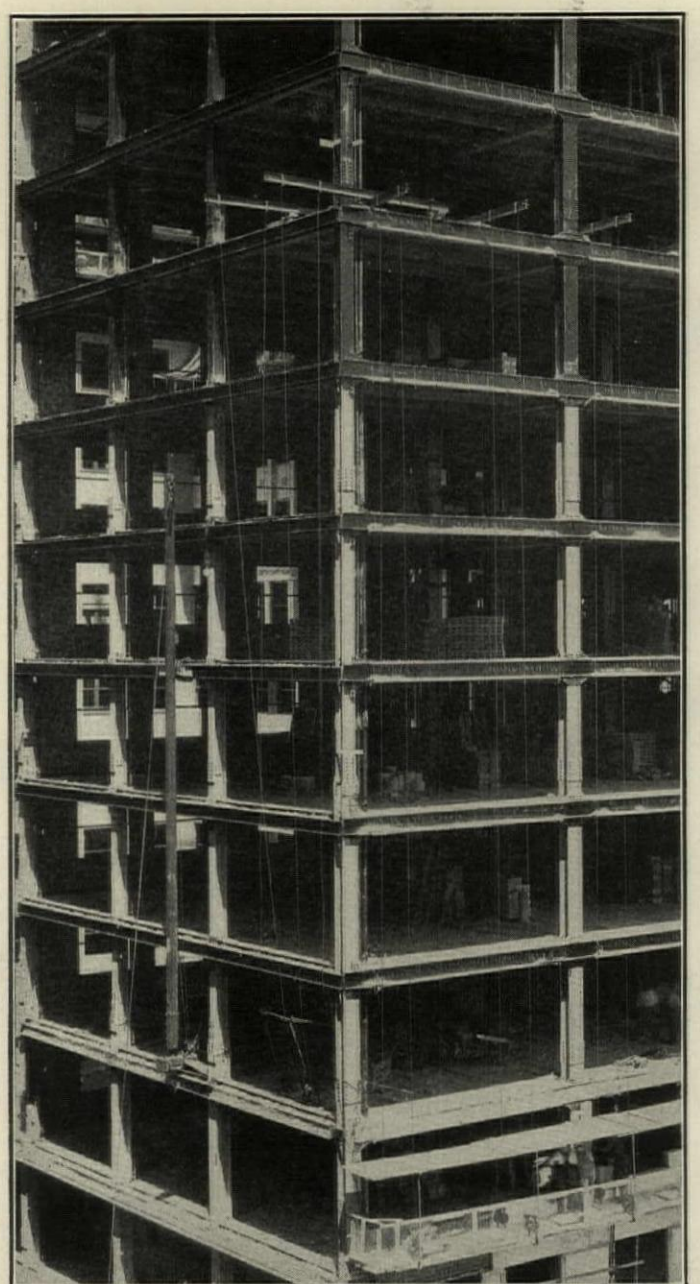

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BECAUSE NATCO MEANS EVERYTHING IN TILE

FOR WALLS—interior and exterior, load bearing, curtain and partition; finished face, brick veneered, or stuccoed—

FOR FLOORS—flat arch, combination floor, or Natcoflor—

FOR FIREPROOFING—on beams, girders, and columns—

—you can safely specify Natco, secure in the knowledge that Natco Structural Clay Tile completely fills each need. No matter what the application, Natco brings to it the sterling qualities of fire-safety, permanence, freedom from maintenance, low depreciation, protection, and all-around economy, that have dictated the use of Natco in almost every building of note erected in recent years.

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General Offices: Fulton Building, Pittsburgh, Pa.

Branch Offices: New York, Chanin Bldg; Chicago, Builders Bldg; Philadelphia, Land Title Bldg; Boston, Textile Bldg.

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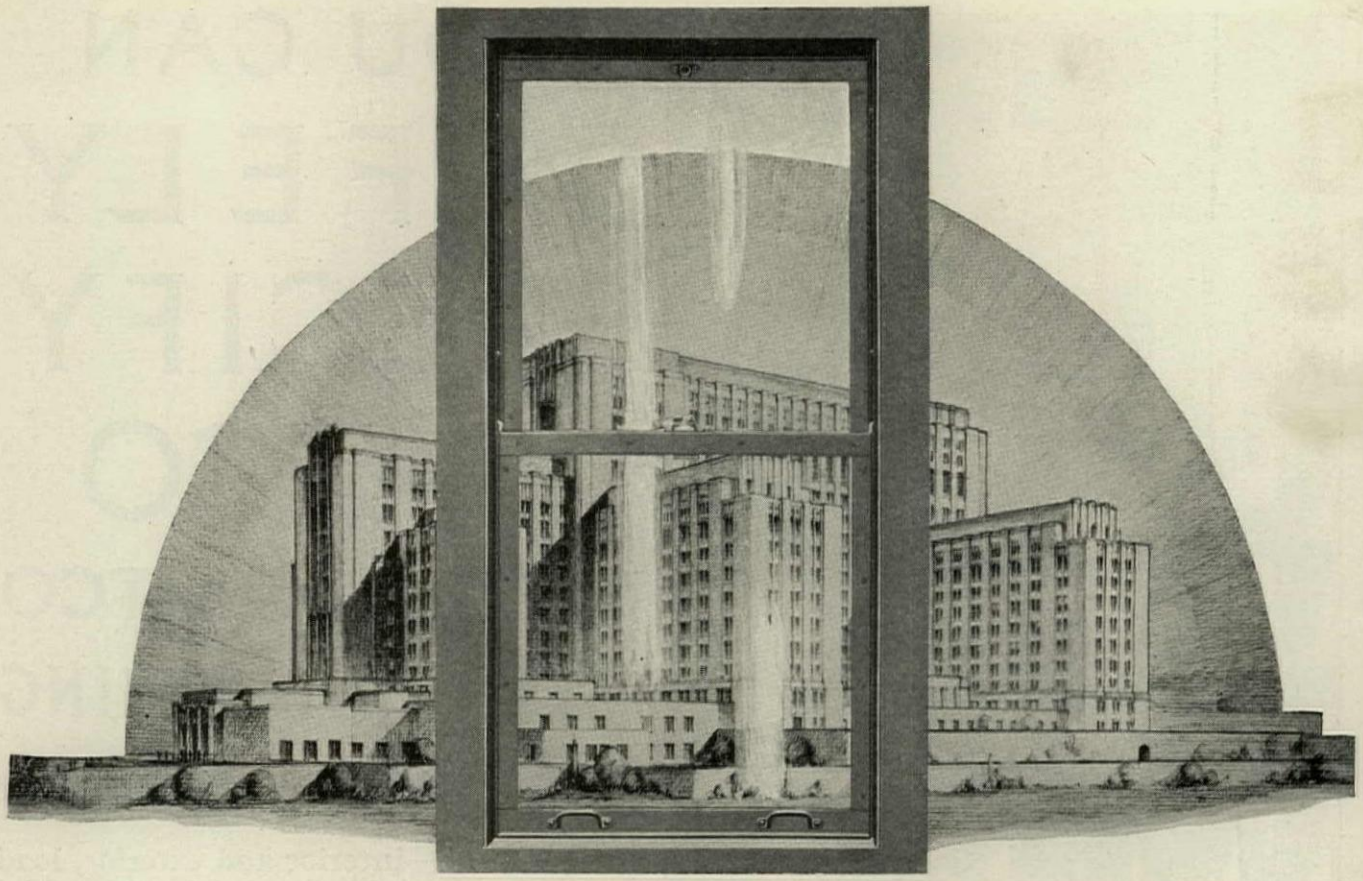
NATCO

THE COMPLETE LINE OF STRUCTURAL CLAY TILE

TURN TO "SWEET'S"



Quality Steel Windows

designed to meet modern architectural needs

To provide a steel window of the highest quality in materials and workmanship has been the constant aim in the development of Truscon Double-Hung Steel Windows. They are built of galvanized solid steel and have bronze weatherstripping. Improved manufacturing methods and large scale production have reduced costs so that Truscon Double-Hung Steel Windows are practical for any good building.

Write for full information, literature and quotations.

TRUSCON STEEL COMPANY, YOUNGSTOWN, OHIO
STEEL WINDOW DIVISION

Truscon Steel Company of Canada, Limited, Walkerville, Ontario
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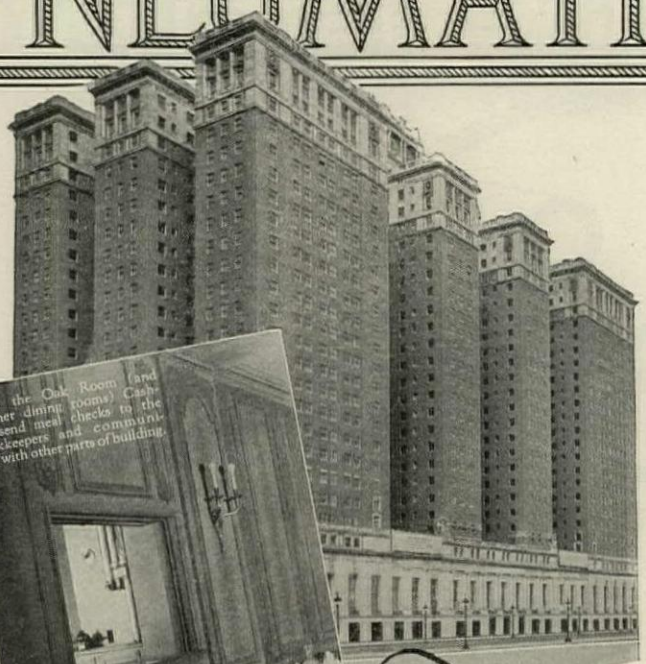
MODEL-No 28

TRUSCON
DOUBLE-HUNG
STEEL WINDOWS
COUNTERWEIGHTED

PNEUMATIC TUBES



In the World's Greatest Hotel

THE STEVENS

CHICAGO, ILLINOIS

HOLABIRD & ROCHE, Architects
WALTER BIRD, Chief Engineer
ERNEST J. STEVENS, President and Gen'l Mgr.

TO RENDER quiet, unobtrusive and always pleasing service to its thousands of daily guests is a task in The Stevens Hotel that demands the most modern equipment to support the large staff of employees. In the prompt execution of routine and special service the G&G Atlas Pneumatic Dispatch System plays an important rôle.

Guests are registering and checking out in a continual procession. Meals are served and charged. Telephone calls, valet service and laundry charges must be transferred to guest accounts *immediately*. Hotel executives, department chiefs and floor clerks must be linked together for the exchange of written messages, orders and other forms.

Banks, hotels, hospitals, newspapers, libraries, mail-order houses, retailers, wholesalers, factories and large offices of all kinds use G&G Atlas Pneumatic Dispatch Tubes for speedily (30 feet per second) distributing mail, telegrams, inter-office papers and light-weight articles among scattered departments. "Mechanical Messengers are faster and more dependable than human messengers."

Catalog in Sweet's Arch't. Cat., 24th Ed., pp. D5116-23
Catalog in Specification Data, 1929 Ed., pp. 228-229

G&G ATLAS SYSTEMS, Inc.

544 West Broadway New York
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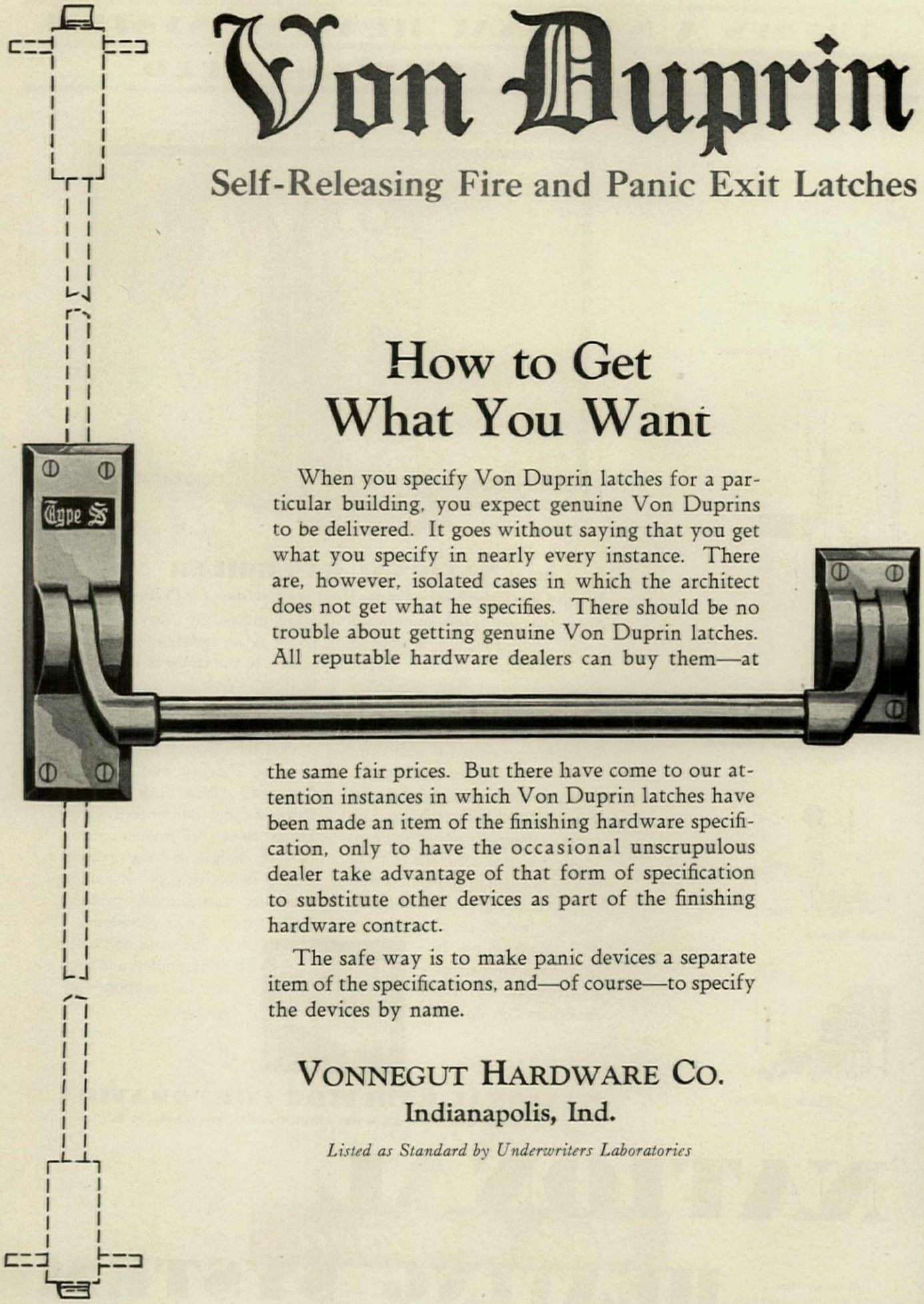
The G&G ATLAS PNEUMATIC TUBE SYSTEM
REG. U.S. PAT. OFF.



Von Duprin

Self-Releasing Fire and Panic Exit Latches

How to Get What You Want

When you specify Von Duprin latches for a particular building, you expect genuine Von Duprins to be delivered. It goes without saying that you get what you specify in nearly every instance. There are, however, isolated cases in which the architect does not get what he specifies. There should be no trouble about getting genuine Von Duprin latches. All reputable hardware dealers can buy them—at the same fair prices. But there have come to our attention instances in which Von Duprin latches have been made an item of the finishing hardware specification, only to have the occasional unscrupulous dealer take advantage of that form of specification to substitute other devices as part of the finishing hardware contract.

The safe way is to make panic devices a separate item of the specifications, and—of course—to specify the devices by name.

VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Listed as Standard by Underwriters Laboratories

Modern hotels and apartments GUARD AGAINST SUDDEN DARKNESS

The Neil House, Columbus, Ohio, protects guests against failure of important lights with reliable Exide Batteries. Gustave Drach, architect, Cincinnati, Ohio.

Architects specify Exide Emergency Lighting Batteries as protection against current failure

MODERN apartments and hotels cannot afford sudden current failure. Tenants and guests would become dissatisfied . . . dangerous confusion might be the result. That's why architects and builders are specifying protection for important lights in hotels and apartments. And they are choosing Exide Emergency Lighting Batteries for absolutely dependable protection. Should the normal power fail, lights are switched to an Exide . . . *instantly and automatically* . . . without a hand touching a switch. And the devices necessary to control and keep the battery in a charged condition are simple and automatic. No expert electrical knowledge is required . . . the usual staff can maintain the system with ease.

Exide engineers, backed by forty-one years' experience in building batteries for every purpose, have designed the Exide Emergency Lighting Battery specially to do its job, efficiently and reliably . . . and economically. Small wonder that architects all over the country are selecting Exides to safeguard banks, hospitals, schools, theatres, stores, offices, auditoriums and any place where the public gathers.

Park Lane Apartments, Hackensack, N. J., are guarded by Exide Emergency Lighting Batteries. Arthur E. Dore, Hackensack, N. J., Architect.

Exide
EMERGENCY LIGHTING BATTERIES

Write today for booklet—"Emergency Lighting Batteries"—it will give you full information on specially designed Exide Batteries.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

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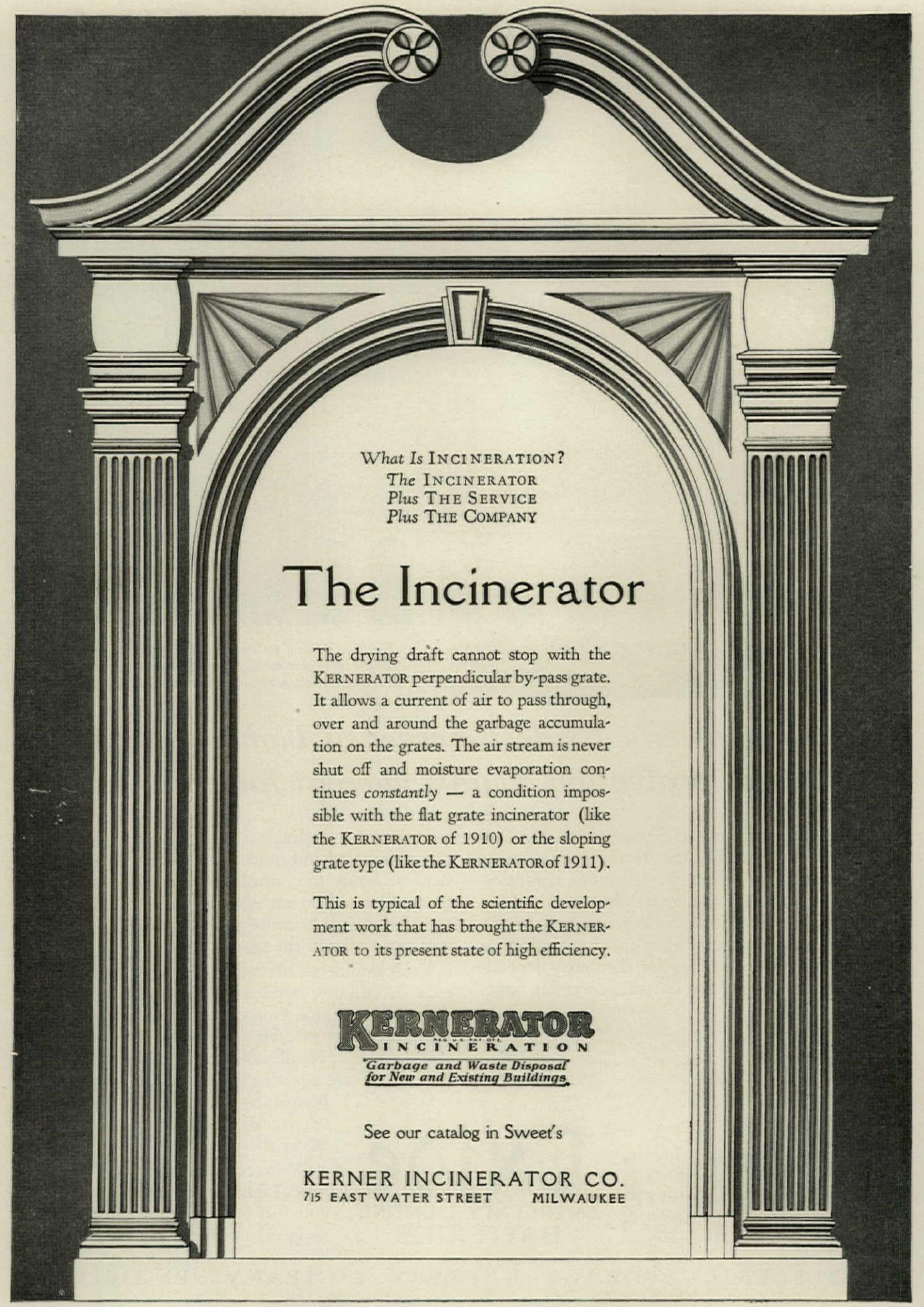
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The drying draft cannot stop with the KERNERATOR perpendicular by-pass grate. It allows a current of air to pass through, over and around the garbage accumulation on the grates. The air stream is never shut off and moisture evaporation continues constantly — a condition impossible with the flat grate incinerator (like the KERNERATOR of 1910) or the sloping grate type (like the KERNERATOR of 1911).
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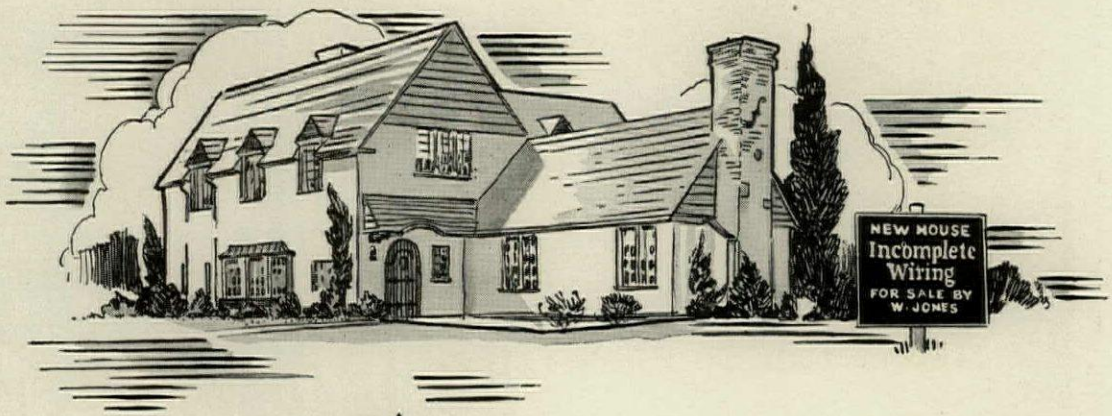
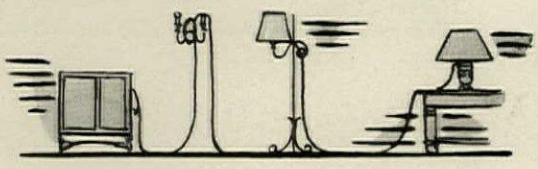


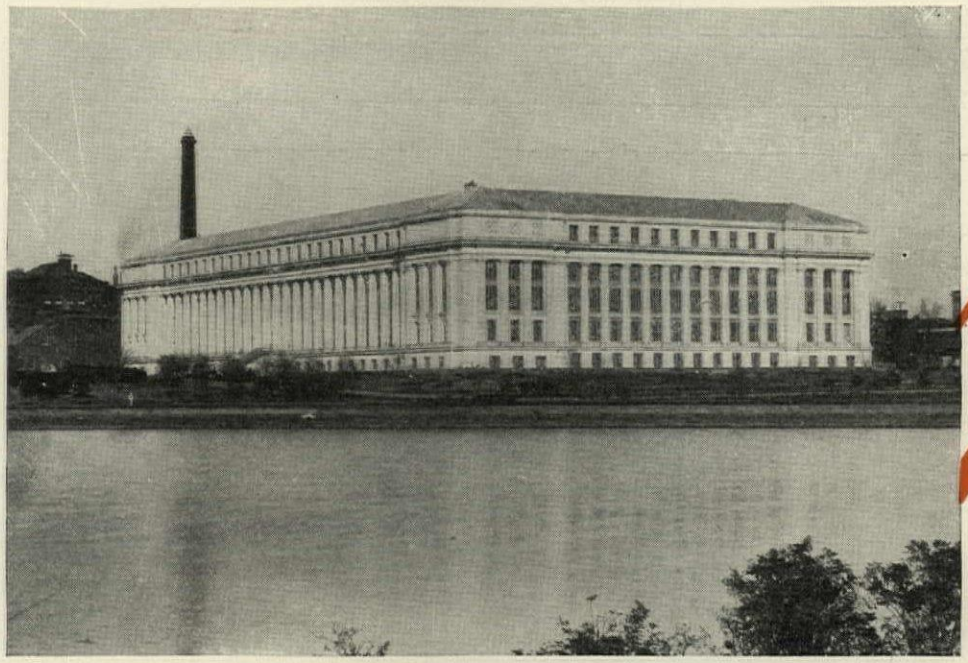
A new house – a good salesman — *but* how about the wiring?

Thousands of prospective "new-house-buyers" have had the experience of living in houses that were inadequately wired. They are tired of having a network of lamp cord covering the walls and



floor. They demand more circuits and

NON-METALLIC



In the Bureau of Engraving and Printing, Washington, D. C., lifetime pipe performance is assured with Youngstown pipe, while the electrical wiring is permanently protected with Youngstown Buckeye Conduit.

You Can Be SURE With Youngstown Pipe, Conduit or Sheets

THERE is no uncertainty as to the quality of Youngstown pipe, Youngstown Buckeye Conduit or Youngstown steel sheets. When you specify Youngstown, you are specifying lifetime service backed by the performance records of thousands of installations.

And Youngstown service matches the high quality of these Youngstown products. When you are confronted with any problem involving the use of pipe, sheets or conduit, you will find the steel counsellors of The Youngstown Sheet and Tube Company glad to be of service to you. Each of the twenty district sales offices is manned by specialists in steel who will be glad to render service without the slightest obligation.

THE YOUNGSTOWN SHEET & TUBE COMPANY

One of the oldest manufacturers of copper steel, under the well-known and established trade name "Copperoid"

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PITTSBURGH—Oliver Bldg.
SAN FRANCISCO—55 New Montgomery St.
SEATTLE—Central Bldg.
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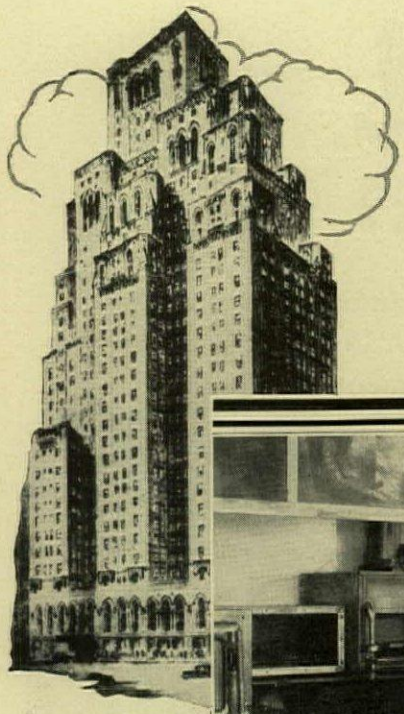
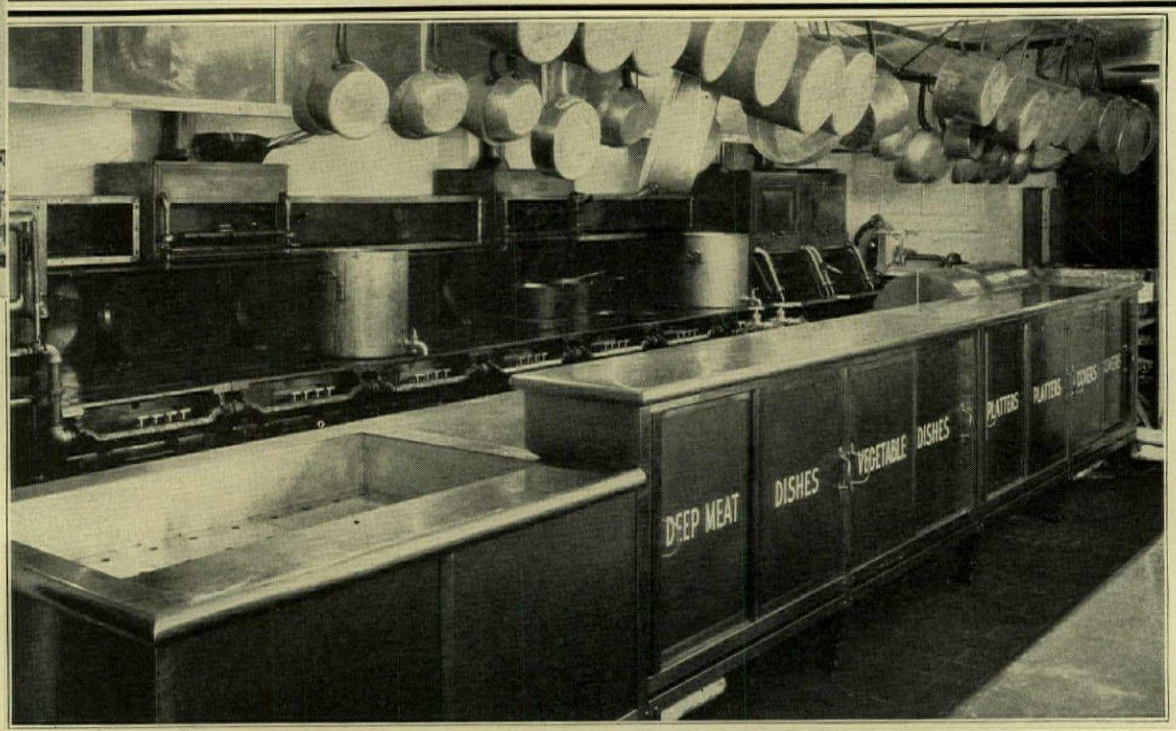
YOUNGSTOWN

GALVANIZED SHEETS PROTECT SAVE WITH STEEL



THE GOVERNOR CHOSE

The Hotel Governor Clinton, New York Latest addition to Van's roster of noted hotels.



MURGATROYD AND OGDEN
Architects

The heart of the kitchen is the range and broiler section. Here is shown this division of the Hotel Governor Clinton Kitchen. The cooks' tables have Monel Metal tops.

The salad pantry is provided with capacious storage and counter space. The refrigerators are Lorillard.

A general view of the main kitchen of the Hotel Governor Clinton, New York, created and installed in its entirety by the John Van Range Company.

CLINTON VAN EQUIPMENT

This great new hotel wanted kitchen equipment that would STAY *new*

Equipment that has something more than surface polish. Equipment that will stand up under years of heavy duty. Equipment that will give uninterrupted service without costly breakdowns or replacements! These were the specifications of the Hotel Governor Clinton.

The hotel management compared brands, claims, prices and previous records. They examined other kitchens. Their final choice . . . the choice of thousands of hotel men during the past 75 years . . . was Van Equipment. No doubt you already know why. Perhaps Van has always been *your* choice, too. If not, we'll gladly send details.

The John Van Range Co.
EQUIPMENT FOR THE PREPARATION AND SERVING OF FOOD
Cincinnati

DIVISION OF ALBERT PICK-BARTH COMPANY, INC.

BOSTON ATLANTA CLEVELAND DALLAS WASHINGTON NEW ORLEANS

General Offices: Oakley, Cincinnati, Ohio

Chicago Sales Office
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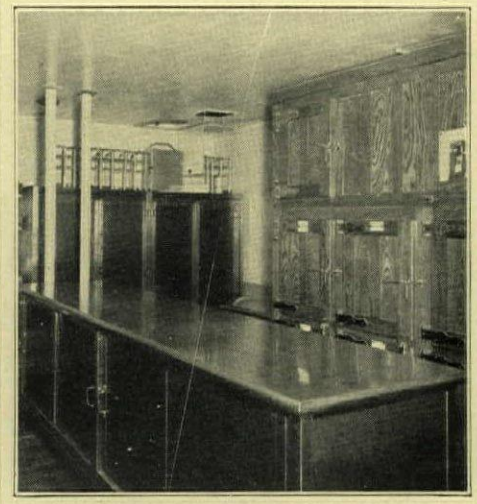
New York Sales Office
38 Cooper Square

The compact kitchens for the Governor Clinton Grill and Coffee Shop. The dishwashing section is at the left; in the background is the range and broiler division.



The room service pantry is equipped for prompt service of hot *food. The large Lorillard Refrigerator is one of many recent installations.*

These New Books Free

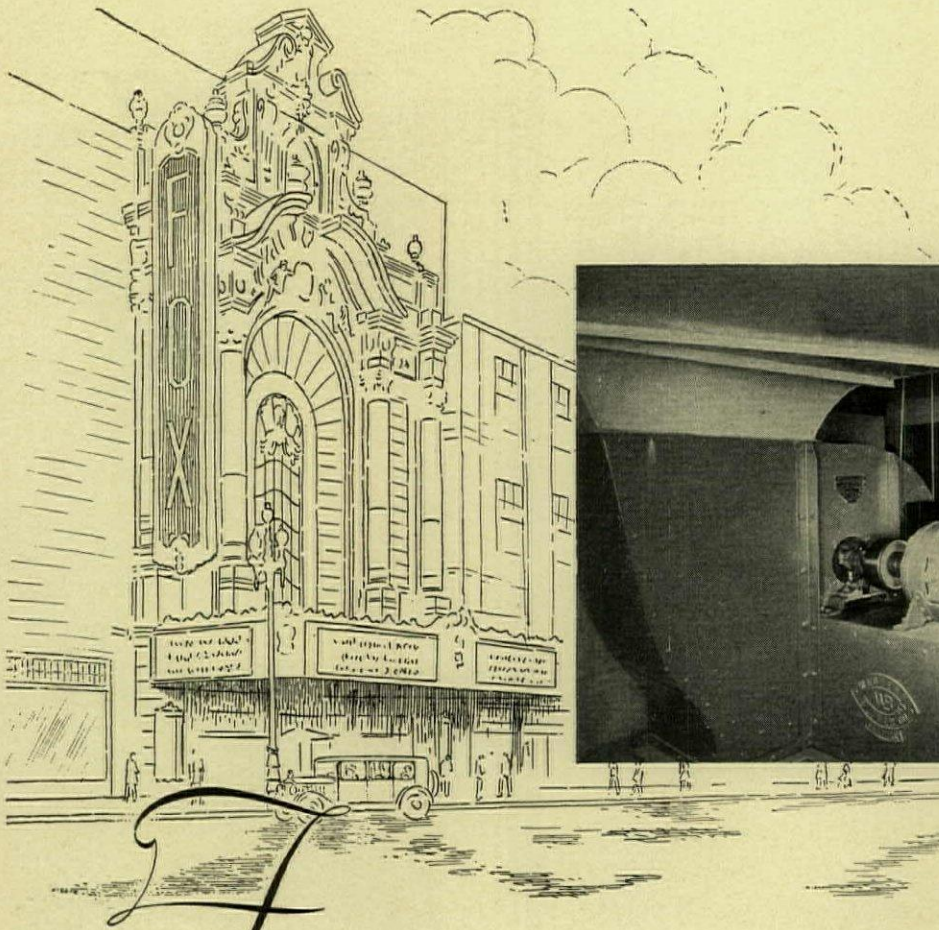
Planning Restaurants That Make Money. An 80-page booklet on the architectural and business problems to be considered in planning all types of commercial restaurants.

Practical Planning of School Food Service. A comprehensive treatise on all phases of school cafeterias and kitchens. Not a catalog. Contains many plates, floor plans and much valuable data.

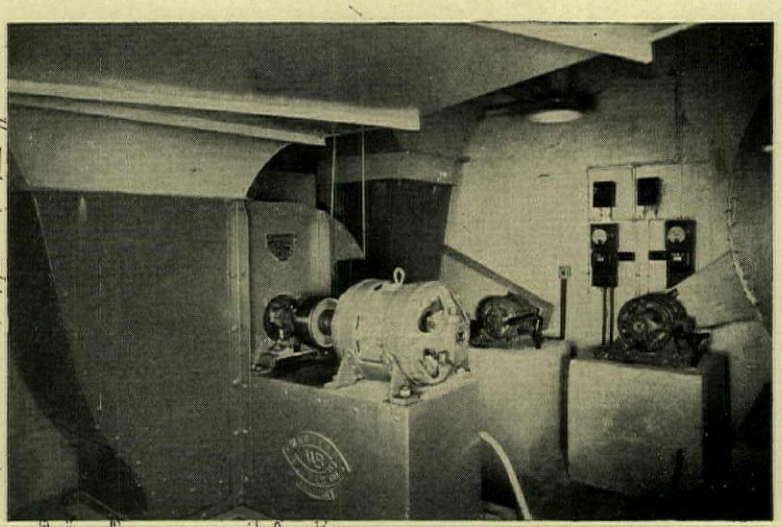
Practical Planning for Church Food Service. Help on a difficult problem! Here printed for the first time are facts about church kitchens and serving rooms, illustrated by many examples, with floor plans and photographs.

Practical Planning for Club Food Service. Unusually complete and authoritative data, with floor plans, etc., are included in this book. An important addition to any architectural library.

A request on your letterhead will bring any of these volumes.



Westinghouse Linestart motors driving Western Blower Company fans in the Fox Theatre.
Architect, Thomas W. Lamb, New York. Electrical Contractor, Alta Electric Co., San Francisco.
General Contractors, McDonald and Kahn, San Francisco.
Consulting Engineer, Charles T. Phillips, San Francisco.



Fresh air -- every five minutes

MODERN theatre builders realize that good, dependable ventilation means continued patronage.

The new Fox Theatre in San Francisco radiates comfort, charm and relaxation from the moment one steps within the door. It's perfect ventilation system contributes much to this pleasing atmosphere.

Powerful Westinghouse motors drive ventilating fans and blowers which circulate the air at the rate of 140,000 cubic feet per minute. Every breath of air in the theatre is changed every five minutes, so that regardless of weather conditions, patrons are constantly assured of the comfort of being surrounded by fresh, clean air.

In the engaging atmosphere of this theatre, Westinghouse equipment plays a conspicuous role—a part that offers a striking example of cooperative effort and unified responsibility.

WESTINGHOUSE ELECTRIC & MFG. COMPANY
EAST PITTSBURGH PENNSYLVANIA

SALES OFFICES AND SERVICE SHOPS IN ALL PRINCIPAL CITIES OF THE UNITED STATES

Westinghouse

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Atlantic City's

THE Hotel Claridge, now under constru tion, is Atlantic City's latest skyscraper

Strategically located at Brighton Pla Indiana Avenue, and Park Place; fronted by superbly landscaped city park; overlooking night the ever-changing hues and shapes of t municipal G-E Novalux electric fountain; a with a broad, unobstructed view of the oce —no wonder that McIlvain and Roberts Philadelphia, the architects, take justifia pride in this project.

In planning, no detail of construction w spared to make each of the twenty-four stor accessible, convenient, and modern. Hen General Electric elevator control has be selected to supply swift and dependa vertical transportation in the beautiful n Claridge.

Model of the new Hotel Claridge—Architects: McIlvain and Roberts, Philadelphia, showing park and G-E Novalux electric fountain in the foreground.

See this model at the General Electric Company's National Exhibit at Central Pier, 1400 Boardwalk, Atlantic City

GENERAL

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

New Skyscraper

FIVE Gurney elevators, rated 2500 lb. at 700 ft. per minute, driven by General Electric elevator equipment of the gearless traction type having variable-voltage control and automatic leveling, will be used in the Claridge.

In their choice of elevator equipment, Messrs. McIlvain and Roberts were governed by the following factors:

The safety of passengers
The comfort of passengers
The prevention of shutdowns
The minimizing of running time

These important advantages are obtained in G-E elevator equipment by the careful interdesign of the component parts, which results in a smoothness of operation almost unbelievable, yet rapid, accurate, simple, and dependable.

The Hotel Claridge will benefit by four outstanding General Electric contributions to the art of elevator control.

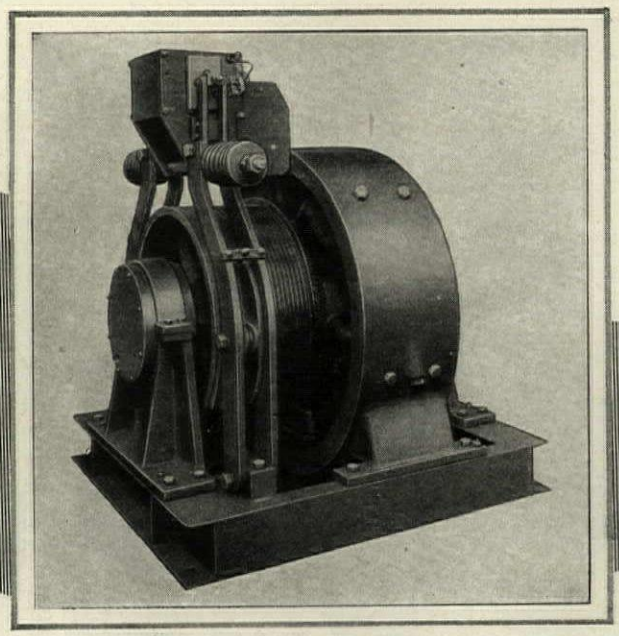
Automatic control of elevator-speed regulation, both at running speeds and at approaching and landing speeds.

Automatic control of acceleration and retardation, resulting in the greatest comfort and the shortest time of operation.

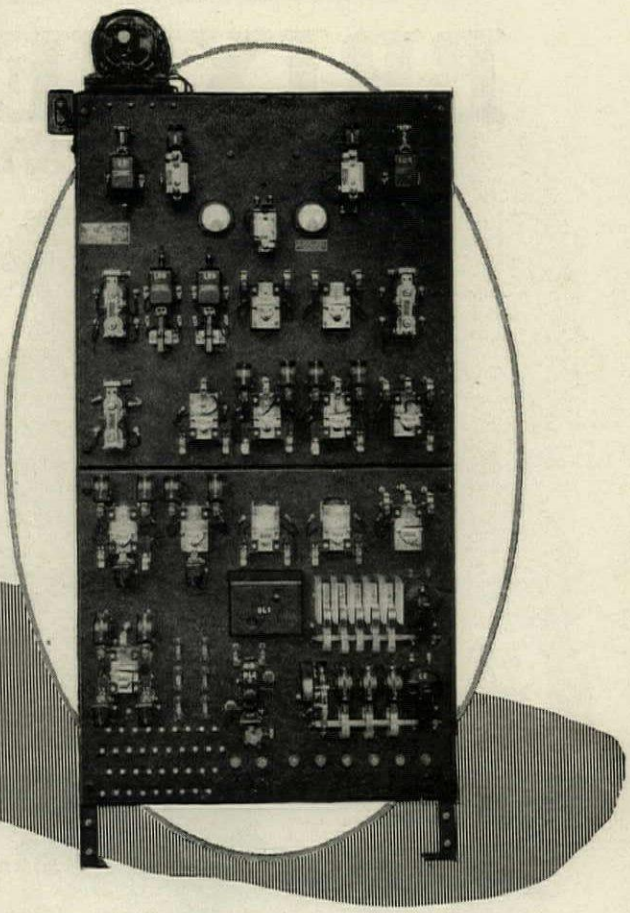
Improved design of elevator equipment, rendering operation more effective and reducing maintenance cost.

Automatic leveling control of the simplest, most accurate, and reliable type, effected through the main elevator motor.

Whenever there exists a problem in vertical transportation in any building, old or new, General Electric stands ready to provide suitable electric elevator equipment.



General Electric gearless traction elevator motor

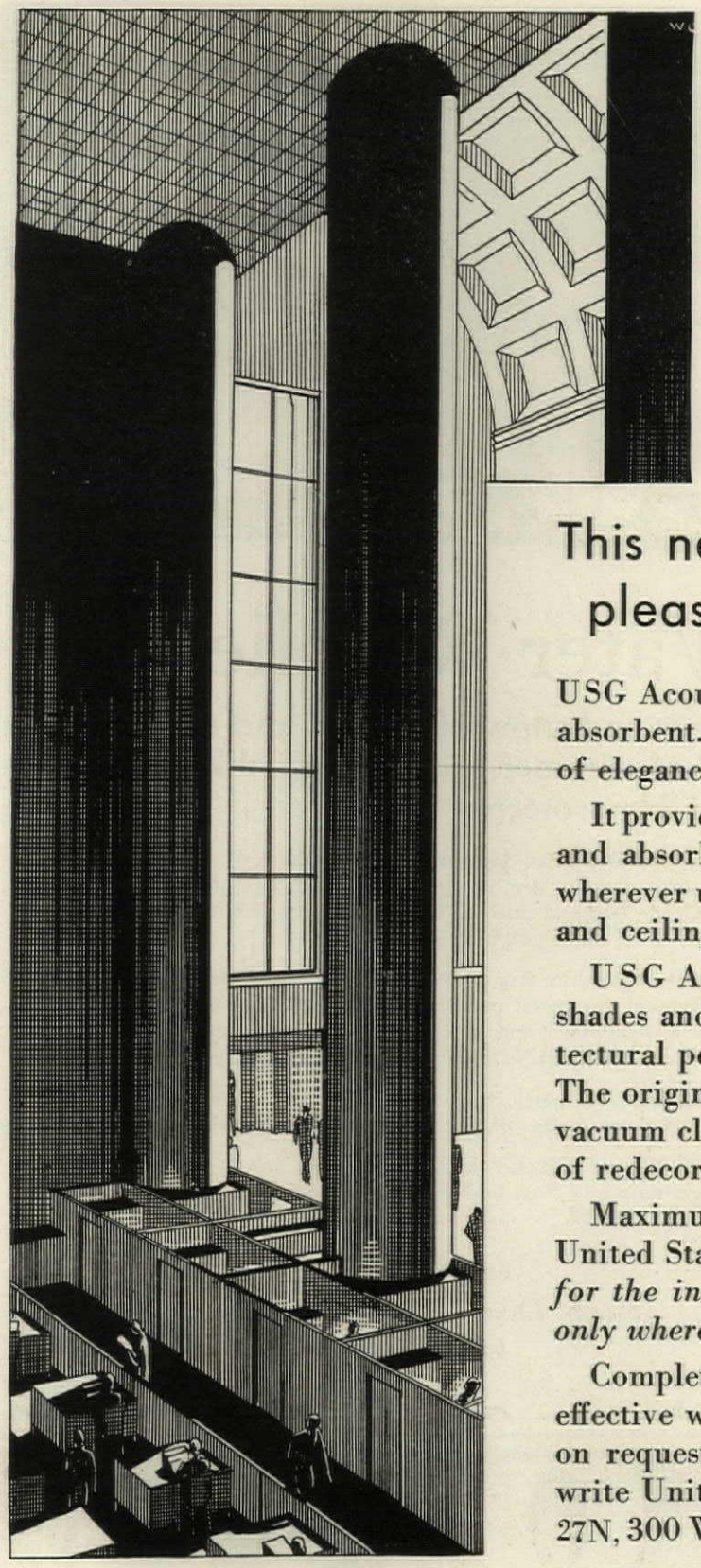


General Electric control panel for automatic leveling

200-323

ELECTRIC

SALES OFFICES IN PRINCIPAL CITIES



Combining beauty with quiet

This new acoustical product pleases both eye and ear

USG Acoustical Tile is a highly efficient sound absorbent. Its antique marble finish adds a note of elegance and dignity to interiors.

It provides acoustical correction in auditoria and absorbs from 60 to 90 per cent of noise wherever used. It is quickly applied over wall and ceiling surfaces in old or new buildings.

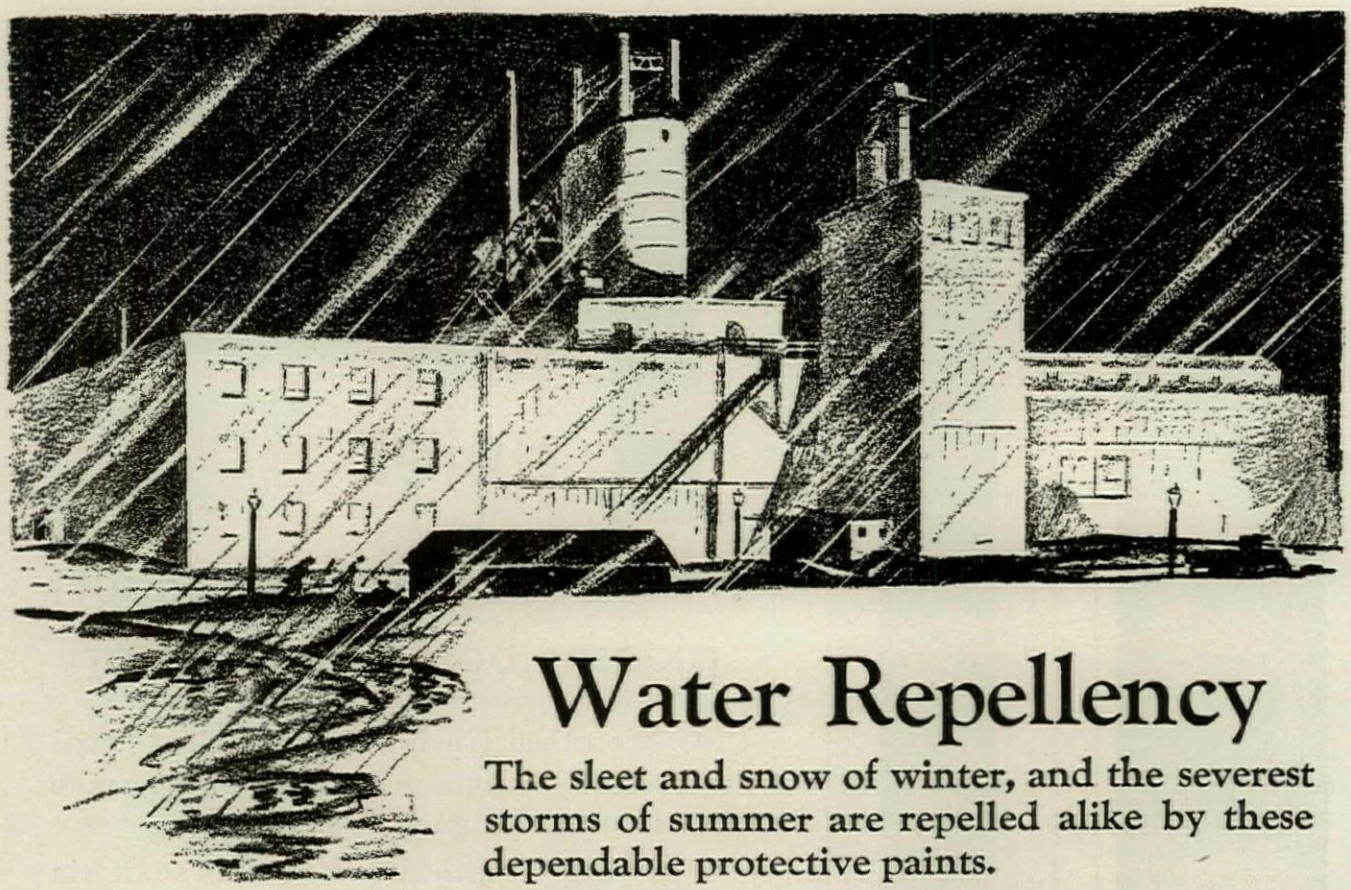
USG Acoustical Tile is available in several shades and sizes to harmonize with any architectural period. Redecoration is not required. The original appearance is easily restored by vacuum cleaning at a fraction of the usual cost of redecoration.

Maximum noise absorption is assured. The United States Gypsum Company *will contract for the installation of USG Acoustical Tile only where the desired results can be secured.*

Complete information for your files on this effective way to control acoustics will be sent on request. Phone your local sales office or write United States Gypsum Company, Dept. 27N, 300 West Adams Street, Chicago, Illinois.

USG ACOUSTICAL TILE

A product of UNITED STATES GYPSUM COMPANY



Water Repellency

The sleet and snow of winter, and the severest storms of summer are repelled alike by these dependable protective paints.

Dixon's Industrial Paints, known for more than 65 years as Dixon's Silica-Graphite Paints, are composed (except Bright Aluminum and Standard Oxide Red) of pure boiled linseed oil combined with the highest grade of flake silica-graphite.

And flake silica-graphite has proved, over the years, to be an unusually effective pigment for metal protective paints. It has a peculiar quality of *"Water Repellency"*; and as corrosion does not occur except in the presence of moisture, *much longer protection is assured.*

It is also absolutely inert, chemically speaking, hence not affected by the action of gases, acids, alkalis, and other destructive agents.

A complete line of Dixon's Industrial Paints in 14 colors, including *Bright Aluminum* and *Standard Red Oxide* is now available. Write for color card No. 227 BI.

DIXON'S
MAINTENANCE FLOOR PAINTS

give maximum protection to wood, composition, concrete and cement floors. Suitable for use indoors or outside. Write for color card No. 227 BF.

Paint Sales Division

Joseph Dixon Crucible Company

Jersey City, N. J.

Established 1827

DIXON'S INDUSTRIAL PAINTS

BOOK DEPARTMENT

WOOD CONSTRUCTION

A REVIEW BY

CLIFFORD WAYNE SPENCER

THE great practical value of a handbook covering all phases of the use of wood in construction will be readily appreciated by all those who are in any way connected with the building industry. The volume on wood construction which is the subject of this review is both complete and up to date in every detail, being a project of the National Committee on Wood Utilization, which was formed in 1925 by Herbert Hoover, its first chairman. The preparation of the work dealing with the utilization of wood for construction purposes was under the control of and sponsored by a sub-committee whose membership included representatives of many organizations,—The National Association of Builders' Exchanges; United Engineers and Constructors, Inc.; The American Society of Civil Engineers; The American Institute of Architects; and the Associated General Contractors of America,—as well as unattached architects, engineers, a director of research in retail lumber, Antioch College, and the editor of the *Engineering News-Record*. The actual preparation of the work was carried out by Dudley F. Holtman, construction engineer for the National Committee on Wood Utilization, with the coöperation and assistance of the control committee which endorses the work as being "an outstanding, authoritative, and up-to-date work on the efficient use of wood in the building and construction field."

The construction of wood buildings is a science that has come down through long ages as a matter of craftsmanship. It has developed slowly, and different practices and usages have been passed on from one generation of workers to the next in the form of a trade, so that a great deal of the essential information regarding the use of wood has never been made available in printed form. With the modern era there have come rapid changes in the methods of carrying out all types of building construction, and it is more or less difficult to keep abreast of the times and to be well informed on up-to-date methods used in all types of construction, including that of wood. In order to make available to architects, engineers, and builders the unprinted information of the craft as well as the new facts and the methods discovered by modern science, the editor and sponsors have undertaken the preparation of this work. "Fundamental facts concerning the nature and available forms of wood, and fundamental principles in the use of wood, constitute the most important part of this book. The aim has been to furnish basic information for use in designing and specifying wood construction, and to aid in the efficient selection and application of the material, and in the adoption of efficient, economical forms of design.

"The first seven chapters give information on the factors affecting the use of wood in construction; lumber grading, grade provisions, and working stresses; the principal woods used in building and construction; the identification of common woods; preservative treatment; the use of paints and stains, and methods of preventing termite damage. The last four chapters contain information on approved methods of using lumber in light building construction and millwork, and in both heavy timber and temporary construction. In the appendix there are given compilations showing the standard grades produced in the various species, and tables of the lumber grades used for various construction purposes."

The subject of the supply available and the physical structure of wood is treated, starting with the most fundamental and elementary facts and developing into quite a scientific treatise covering such matters as the cellular structure of woods, density, moisture and various defects that are likely to occur in the structure of commercial woods, including knobs, pitch streaks and pitch pockets, pin worm holes, grubworm holes, checks, shakes, compression wood, and cross graining. The effects of these defects on the strength and durability are pointed out and discussed. An interesting passage in the work is that in which the author points out that certain common popular beliefs in regard to the strength of wood are not founded on fact. Such beliefs include the popular supposition that wood cut from dead trees is likely to be weaker than that cut from live trees; that virgin growth or second growth trees all produce wood of a similar strength, and that the hard woods and soft woods are affected in opposite manners by the fact that they are first or second growth timber; that time of cutting has an important effect on the durability of wood; that air-dried wood is stronger than kiln-dried wood or vice versa. The author expresses the opinion that all these popular beliefs are either erroneous or are true to such a limited extent as to be unimportant from a practical standpoint.

The subject of lumber grading is important to the specification writer, since by the use of the standard symbols and terms adopted by the lumber industry for signifying the sizes or character of lumber he may make it very definitely understood exactly what kind and quality of lumber he wishes to use. The definitions of lumber grading terms, the abbreviations applying to lumber and various standard rules and grades are a result of investigation of the most approved usage current in the lumber industry and are standard, authentic and up-to-date. The information contained in these pages of standard sizes, terms, and other usages is well nigh indispensable if one is to make really intelligent use of wood as it is commercially supplied. The tables and notes on working stresses give extreme fiber in bending,

maximum horizontal shear, compression perpendicular to grain, and the modulus of elasticity for both select and common grades of a large variety of common woods, according to the purposes for which they are to be used in buildings or other structures.

One of the most important questions to be decided when wood construction is contemplated is, what variety of wood is best fitted to serve all purposes in that particular case. This is a question which is far too often decided in a haphazard and inefficient manner. Architects or their assistants are very likely to pass final judgment on this matter without devoting sufficient study to the governing factors and without having sufficient knowledge of the subject on which to base such an important decision. The enumeration of the principal woods used in building and construction, contained in this book, is intended to give information of practical value on the properties of the various species and to point out the uses to which each wood is most commonly applied. Judgment is needed to select the proper species for particular uses, but judgment cannot be better than the information on which it is based. Therefore an effort is made to give reliable, authentic information, based upon the experience of those who use wood in construction. The forest region in which each species grows is described, and the peculiar characteristics inherent in a species which affect its use in construction are discussed. Strength, durability, receptivity to paint or stain, and other distinguishing qualities are also outlined. Easy methods for the identification of common varieties of both hard wood and soft wood are described in a separate chapter, and the descriptions of the markings, textures and other characteristics of various woods are illustrated by small plates from photographs showing samples of the various species.

The preservation of wood has been practiced for centuries, but it was not till the beginning of the nineteenth century that the preservation of woods by the injection of chemicals became scientific in principle. Many materials have been used and many methods tried to make wood resist decay, insects and marine borers, and out of this wealth of experience, by the law of survival of the fittest, a few preservatives have come into extensive use. The best of these preservatives are described and their merits discussed. The methods of treating wood with these preservatives are also described. The practice of making wood fireproof or fire-resistant by use of various treatments has become quite prevalent in this country, about 50,000,000 feet of lumber being treated in this way in 1927, and the various methods of treatment for this purpose are also described and discussed. By far the most important form of preserving wood is, of course, by sealing the surface with paint or varnish. Good lumber which is kept properly painted will last practically indefinitely. Points covered in the chapter on paints and stains include such important considerations as the kinds of paint available; the methods of applying paint, comparing the desirability of the use of the hand brush with that of the spray machine; a schedule of paints to be used for various purposes; painting defects, including chalking, blistering and peeling, non-drying and washing paints, "alligatoring," darkening, gas discolorations, copper stains, brown staining, mildew, and various kinds of spotting. The knowledge as to the causes of and remedies for these various defects to which

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paint is subject that can be gained from the pages here devoted to the matter will be of the utmost practical value in directing the painting of all sorts of structures. The advice on the actual choice of paints and stains and the hints on color combinations include a great deal of information of the greatest practical value.

The great losses which are caused by the attacks of termites or white ants on wood, especially in southern or tropical regions, have led the author to devote a chapter to the discussion of these insects and the ways in which their damage may be combated or prevented. The chapters on light building construction and millwork cover in a most complete manner all the problems that an architect may be called upon to solve in connection with frame buildings or the finishing of other types of buildings with wood. The reproductions of construction details represent the most up-to-date practice in the detailing of wood work for use in building construction. The chapter on heavy timber construction is no less valuable as a guide to the laying out of heavy timbered structures such as mills, roof trusses, bridges, airplane hangars, and piles and dock and pier constructions. The chapter on temporary construction has to do largely with the designing of centering and forms for concrete and other masonry work, and a great deal of space is devoted to covering this rapidly developing field of engineering.

WOOD CONSTRUCTION; PRINCIPLES, PRACTICE, DETAILS. By Dudley F. Holtman. 711 pp., 6 x 9 ins. Price $6. McGraw-Hill Book Company, Inc., 370 Seventh Ave., New York.

OF the various publications of an archæological nature issued under the auspices of American scholars there are few more interesting and valuable than the volumes which for several years have been published annually by the Harvard University Press and edited by members of the Departments of Fine Arts of Harvard and Princeton. These volumes, extremely well illustrated and richly printed, deal with various aspects of ancient painting, sculpture and the like, and each of the subjects discussed is treated after considerable research by some member of these departments who has made a particular study of the matter. The volume for 1929 is equal in every detail to those which have preceded it. The subjects treated are: "Portraits of the Evangelists in Greek and Latin Manuscripts, Part II," by A. M. Friend, Jr.; "The Illustrated Manuscripts of Prudentius," by Helen Woodruff; "A Spanish Altar Frontal in the Gualino Collection," by Walter W. S. Cook; "A Gothic Reworking of an Early Christian Sarcophagus," by Marion Lawrence; "The Gothic Frescoes at Monte Siepi," by George Rowley; "Pietro Lorenzetti," by Ernest T. De Wald, and "North Italian Gothic Ivories in the Museo Cristiano of the Vatican Library," by Donald Drew Egbert. Many of the subjects discussed have a direct bearing on architecture, which in one way or another makes use of all the arts, and these volumes, all of which are carefully prepared and well documented, constitute invaluable additions to the steadily growing accumulation of works upon these and other more or less related topics.

ART STUDIES: MEDIAEVAL, RENAISSANCE AND MODERN. Edited by Members of the Departments of the Fine Arts at Harvard and Princeton Universities. 206 pp., 70 plates. Price $3.50. Harvard University Press, Cambridge, Mass.

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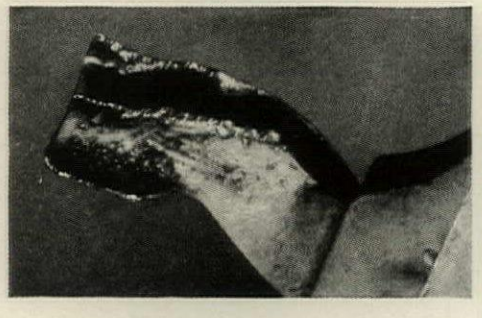

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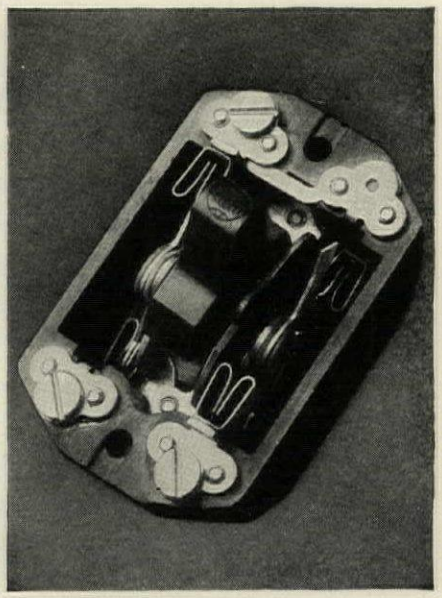

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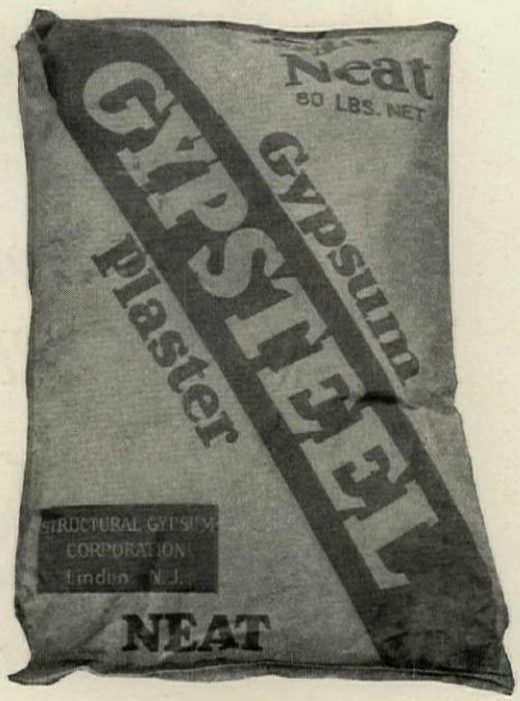

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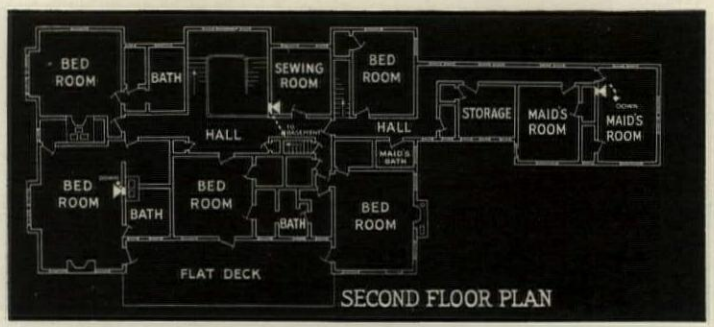

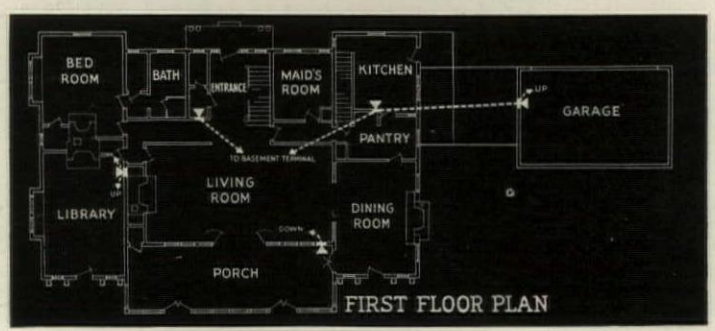

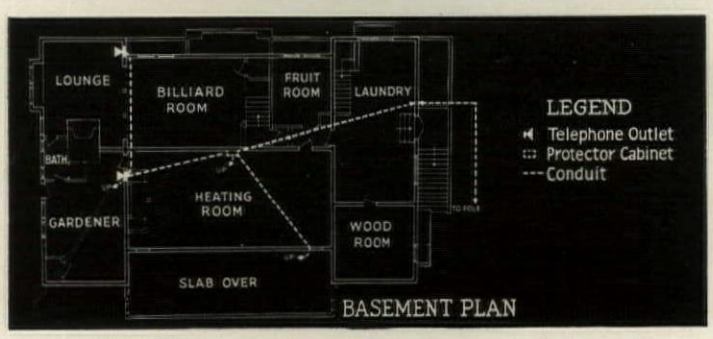

IN DESIGNING a residence, it is often desirable to provide for communication within the house . . . bedroom to kitchen, for instance, or library to garage . . . as well as to the outside. Home owners find this especially convenient for conducting household business, receiving incoming calls or talking to people in other parts of the house. Bell System equipment makes it possible to have this intercommunication over certain of the house telephones, without interfering with outside calls.

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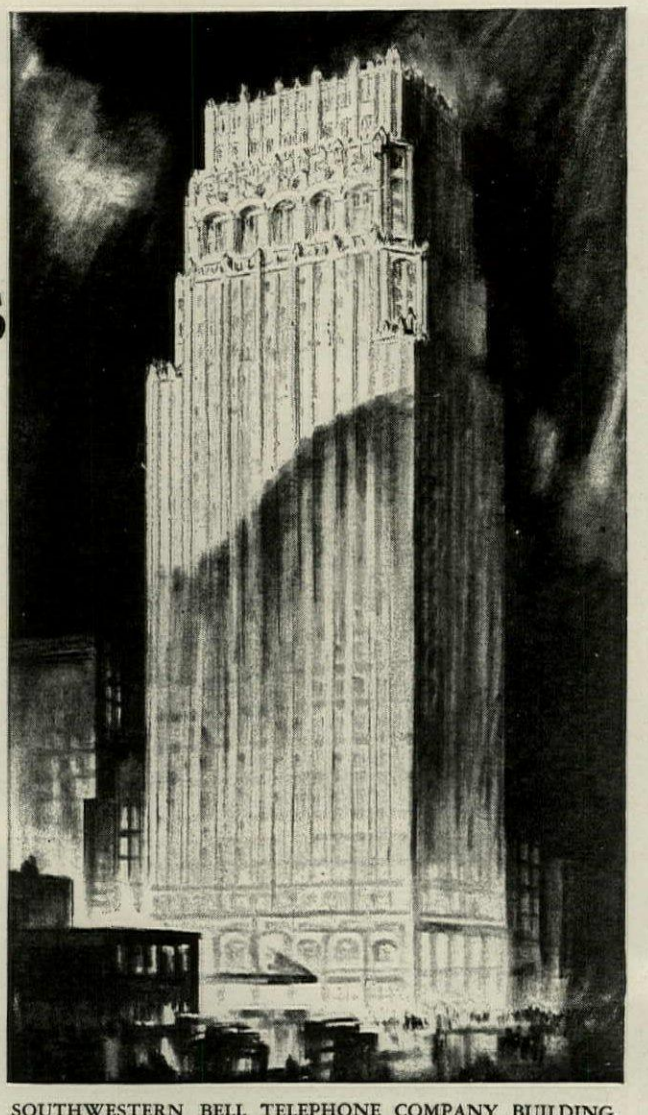

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THE
ARCHITECTURAL FORUM

VOLUME LI — NUMBER SIX

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THE ARCHITECTURAL FORUM is published monthly by National Building Publications, Division of National Trade Journals, Inc., 521 Fifth Avenue, New York.

H. J. Redfield, Chairman of the Board and Treasurer; Howard Myers, President and General Manager; John Thomas Wilson, Vice-President; James A. Rice, Vice-President; C. Stanley Taylor, Vice-President; Henry J. Brown, Jr., Secretary.

Yearly Subscription, Payable in Advance, U. S. A., Insular Possessions and Cuba, $7.00. Canada, $8.00. Foreign Countries in the Postal Union, $9.00. Single Copies: Quarterly Reference Numbers, $3.00; Regular Issues, $1.00. All Copies Mailed Flat. Trade Supplied by American News Company and its Branches.

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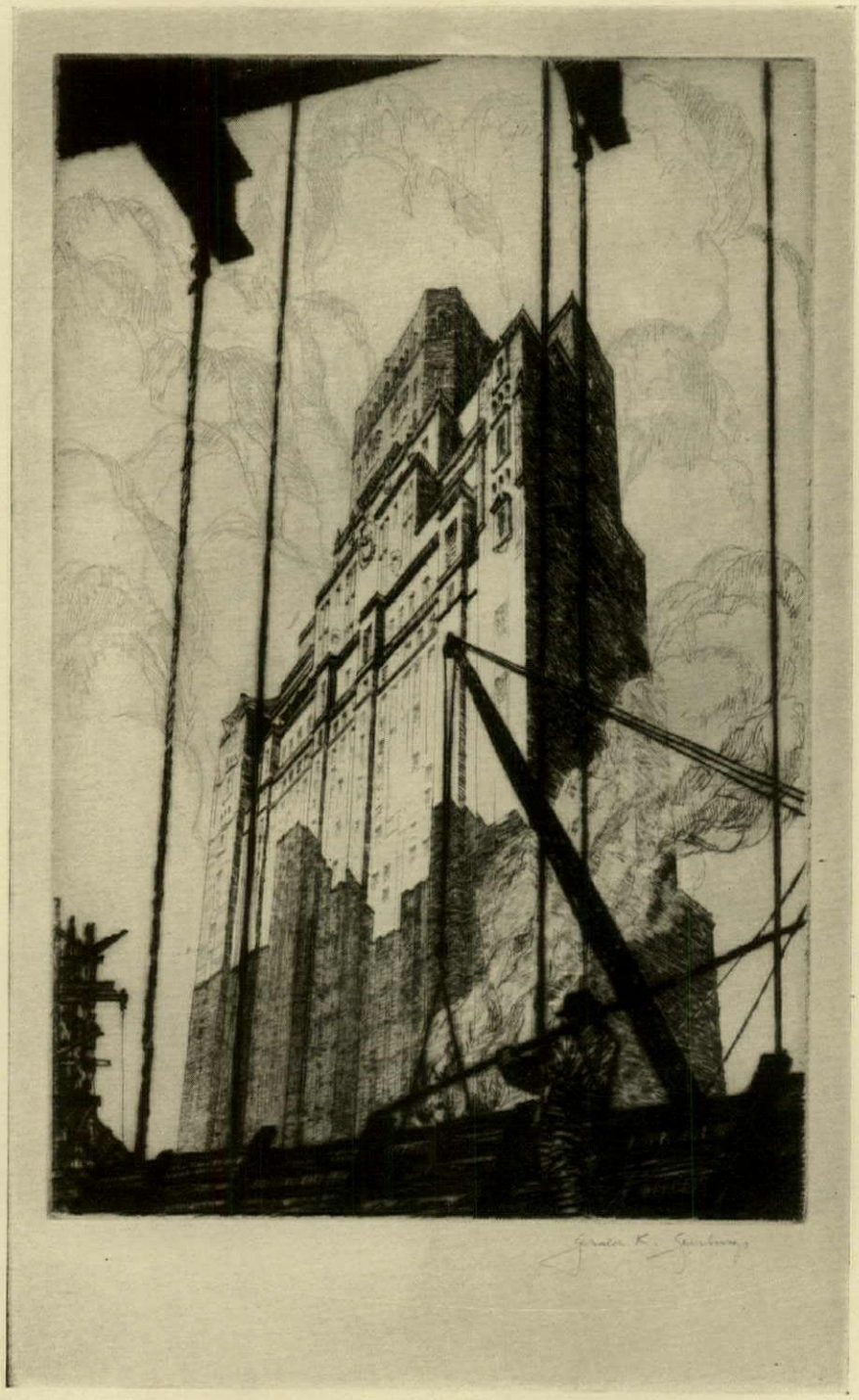

OLYMPUS 1929

From an Etching by Gerald K. Geerlings

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The Architectural Forum

THE
ARCHITECTURAL
FORUM

VOLUME LI NUMBER SIX

DECEMBER 1929

THE PRESENT STATUS OF THE HOTEL BUSINESS

BY
JAMES S. WARREN
EDITOR *Hotel Management*

FAR-REACHING changes have taken place in the hotel business in the past 12 years. While it is a fact that this is also true in most, if not all, other business fields, there have in this period been several outstanding changes in the nation's economic structure which have peculiarly and individually affected hotels.

Prohibition's Effects. In the first place, the Eighteenth Amendment and the Volstead Act did away with the hotel bar. Almost overnight the most profitable source of revenue in many hotels was wiped out. Insofar as hotel structures were concerned, the problem presented was not particularly serious. Progressive hotel operators and architects were quick to devise other revenue-producing departments or services that could be installed in the former bars. Frequently these took the form of coffee shops or cafeterias (the latter are now waning in popularity, by the way), while in other cases stores, beauty parlors or soda fountains were substituted.

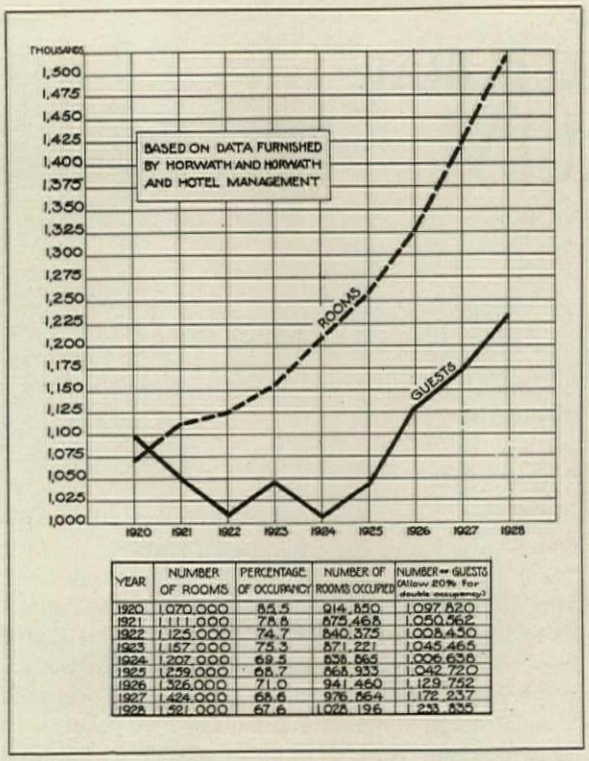
From the standpoint of net profits, however, Prohibition brought with it a most serious problem for hotel executives. Particularly in those hotels whose bars had become popular service features, was it found impossible to make their substitutes produce the same revenue. As shown by one of the accompanying charts, hotel rates were materially increased, and fortunately accommodations were at such a premium at the time that higher prices were paid by the public with little complaint.

On the constructive side of the problem, however, Prohibition did do this for the hotel business: For the first time hotel men at large came to appreciate the fact that they are modern *business men* and in business for the purpose of making a profit on the major items they have for sale,—their rooms and food. Theretofore they had relied in far too many instances on their bars to carry the burden of their entire establishments.

Shortly after Prohibition's advent,—and due no doubt to this new and more businesslike attitude,—a demand for educational training and for basic operating facts began to make itself felt. In 1921 Frank A. Dudley, President of the American Hotel Association, went to the Federal Board for Vocational Education in Washington with a request for an educational survey. "Vocational Education in the Hotel Business," by Layton S. Hawkins and W. I. Hamilton, was the result, and it laid the foundation for the widespread program of hotel education and research that followed. All hoteldom became imbued with a new and wholly desirable sense of its importance in the business community and of its responsibilities to society. Hotel men had graduated from tavern keepers to civic hosts; they represented their fellow citizens well or poorly in proportion to the degrees of comfort, convenience and safety which they afforded visiting strangers.

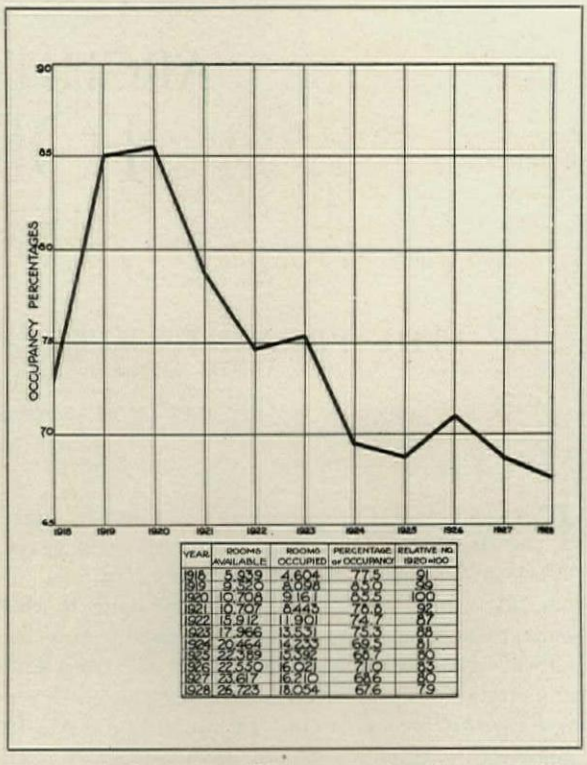
With this new enthusiasm and this new ideal of hotel service it followed quite logically that great strides were soon made in the raising of operating standards, in service refinements, and finally in net profits. Hotel men themselves became so enthusiastic and "sold themselves" and their hotels to their communities so successfully that their fellow business men, in turn, began to look to the hotel business as an added source of individual profit.

***The Boom of* 1920-1927.** They saw what their local hotels, with their improved appearance and service, had done for themselves and the towns. Hotel promoters were not slow to grasp the situation, and in many instances to create such a situation where it had not hitherto existed, with the result that bigger and better hotels began to spring up in many communities that could not afford them. "No hotel is too good for Blankville; we should have as fine accommodations as can be had in New York or anywhere," became the slogan at innumerable Chamber of Commerce, Rotary, Kiwanis and "booster" meetings. And have



YEAR	NUMBER OF ROOMS	PERCENTAGE OF OCCUPANCY	NUMBER OF ROOMS OCCUPIED	NUMBER OF GUESTS (Allow 20% for double occupancy)
1920	1,070,000	85.5	914,850	1,097,820
1921	1,111,000	78.6	875,468	1,050,562
1922	1,125,000	74.7	840,375	1,008,450
1923	1,157,000	75.3	871,221	1,045,465
1924	1,207,000	69.5	838,865	1,006,638
1925	1,259,000	68.7	868,933	1,042,720
1926	1,326,000	71.0	941,460	1,129,752
1927	1,424,000	68.6	976,864	1,172,237
1928	1,521,000	67.6	1,028,196	1,233,835

Trend of Number of Rooms and Guests Showing Large Increase in Rooms Available in Recent Years



YEAR	ROOMS AVAILABLE	ROOMS OCCUPIED	PERCENTAGE OF OCCUPANCY	RELATIVE NO. 1920=100
1918	5,939	4,604	77.5	91
1919	6,930	5,098	73.6	89
1920	10,706	9,161	85.5	100
1921	10,707	8,445	78.8	92
1922	15,912	11,901	74.7	87
1923	17,968	13,591	75.5	88
1924	20,464	14,233	69.5	81
1925	22,389	15,392	68.7	80
1926	22,330	16,021	71.0	83
1927	23,617	16,210	68.6	80
1928	26,725	18,054	67.6	79

Trend of Occupancy Percentages in European Plan Transient Hotels, Showing Decrease in Room Occupancy

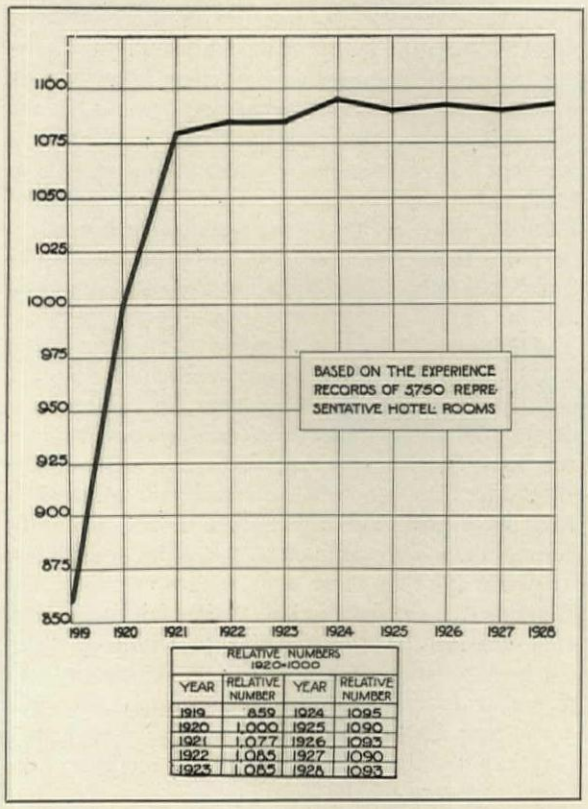
them they did,—with the disastrous results shown all too clearly by several of the charts reproduced with this article. Economists generally characterize the period 1920-1927 as that of the transition from a "seller's market" to a "buyer's market." Industry as a whole suffered from growing pains during this era, just as did the hotel business. Most of the extractive and manufacturing fields overstressed the production function and understressed the distribution and selling functions, with the result that they found themselves with surplus goods on hand.

Over-production. There is, however, this very marked and fundamental difference between the overstocked miner or manufacturer on the one hand, and the overstocked hotel man on the other. The former can curb his future production and store his present stock until the opportunity comes to dispose of it. Or, if his product happens to be perishable, he can profit from his experience and regulate his future production accordingly. A hotel room, on the other hand, is a most perishable commodity. Every night it is not sold it represents an irretrievable loss, for that night will never return. And once a hotel is built, it is there to stay for many years; there is no way a hotel man can curb his production. He can increase it, but he cannot decrease it.

The 1928 Situation. This over-built situation had become so acute by 1928 that hotel associations and hotel publications began to actively discuss ways and means of combating it. The chief difficulty lay in the lack of basic total statistics regarding the hotel business. The federal government had never seen fit to identify hotels as a separate entity in its statistical compilations of business facts, with the result that the size of the hotel business, the capital invested in it, its annual turnover, number of employes, and so forth, were largely matters of conjecture.

The Investigation. In March, 1928, editors of *Hotel Management* conceived the plan of having a fact-finding survey that would disclose such data as we just mentioned, made by an independent and reputable organization, whose recommendations, as based on its findings, would carry weight with the investing public and with the other groups interested in hotel projects. The Engineering-Economics Foundation, a post-graduate college of Boston, which specializes in ascertaining and disseminating fundamental economic facts to men in business, was selected for this purpose. The financial sponsors of this survey were the Bowman-Biltmore Hotels Co., Eppley Hotels Co., Hotel Astor, Hotels Statler Co., The Savarins, Inc. and United Hotels Co. of America. Much credit is due these organizations for their generosity in advancing the fee the Foundation requires for all such undertakings as this for a cause in which all hotel men benefited equally.

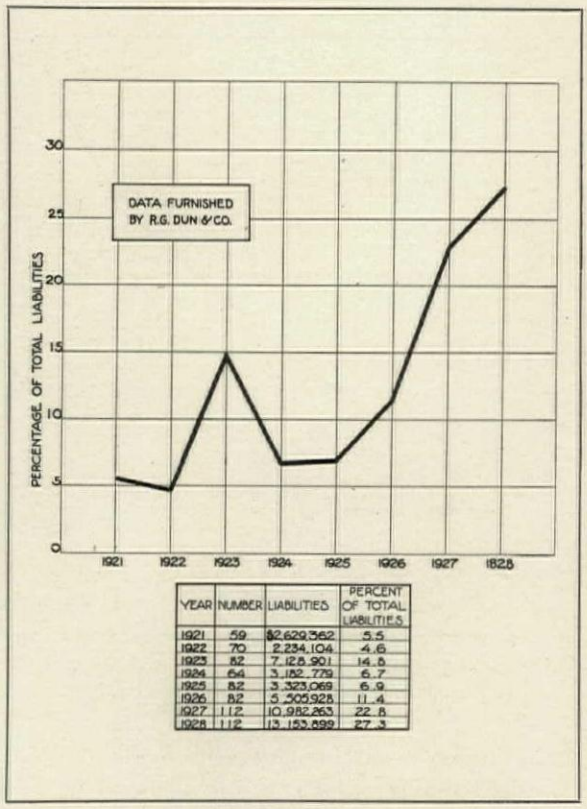
A committee of 18 practical hotel operators was organized for the purpose of defining the



RELATIVE NUMBERS 1920=1000

YEAR	RELATIVE NUMBER	YEAR	RELATIVE NUMBER
1919	859	1924	1095
1920	1,000	1925	1090
1921	1,077	1926	1093
1922	1,085	1927	1090
1923	1,085	1928	1093

The Trend of Room Income for European Plan Transient Hotels. Room Rates Have Not Changed Recently



YEAR	NUMBER	LIABILITIES	PERCENT OF TOTAL LIABILITIES
1921	59	$2,629,362	5.5
1922	70	2,234,104	4.6
1923	82	7,128,901	14.8
1924	64	3,182,779	6.7
1925	82	3,323,069	6.9
1926	82	5,505,928	11.4
1927	112	10,982,263	22.8
1928	112	13,153,699	27.3

The Trend of Hotel Failures Shows a Steady Increase. The Other Charts Indicate Reasons for this Trend

scope of this investigation and advising with the Engineering-Economics Foundation from time to time. The fact-finding part of this investigation occupied virtually a year's time. This period had been established in advance, due to the fact that all the interests involved realized that the Foundation would have to work in a virgin field. The accompanying charts are representative of the fundamental economic information developed in the course of this survey, and the statistics they give are the first authoritative trend data developed for the hotel business. These charts, in the form of reprints of progress reports on this survey, were published in *Hotel Management*. The final step in this last, or "fact-disseminating," stage of the survey will be the publication, in January, 1930, of a book "Promoting New Hotels,—When Does It Pay?" by Harper & Bros. This volume will give the results of this year of original research in detail, with particular reference to the community hotel promotion problem.

Recommended Procedure. Of the overbuilt situation, Dr. Hollis Godfrey, President of the Engineering-Economics Foundation, writes:

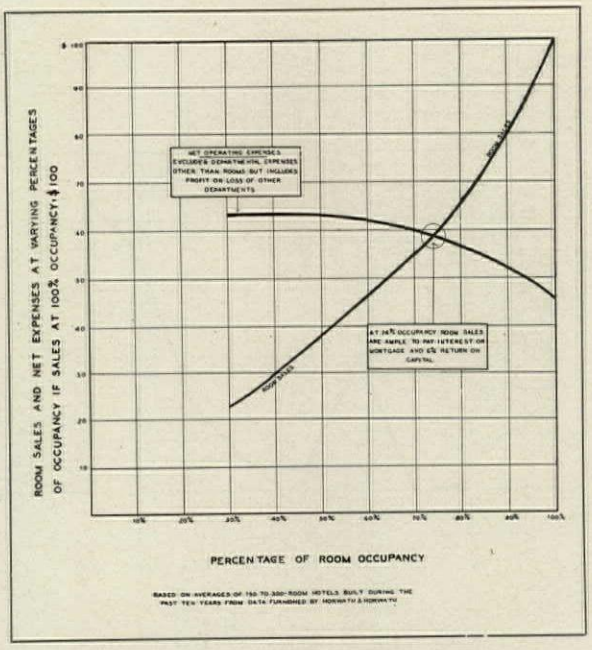
"Now that the Foundation's study of supply and demand in hotel rooms has been brought to a conclusion, and the facts this study brought to light have been transmitted to the interested groups through your publication and other media, I feel confident that the Foundation's staff will be entirely safe in emphasizing our original tentative recommendations with regard to the serious economic status of this business wherever, in the course of our contacts with other business fields, we feel that they may prove of value. You will recall that these were:

"First,—That city hotel associations whose members are threatened with the over-construction menace conduct a survey similar to that recently carried out by the Hotel Association of New York.

"Second,—That before any new hotel is financed a detailed and unbiased survey be made by qualified and experienced hotel experts and accountants, and that prospective investors be urged to request all such information as this and to consult with their bankers regarding the investment.

"Third,—That hotel and allied interests insist upon a stricter enforcement than is at present exercised of the laws regarding the issuance and sale of real estate bonds, to the end that inflated appraisals and speculative securities will be eliminated from hotel financing."

Findings of Investigation. Architects will be vitally interested in the findings resulting from this survey for two important reasons. In the first place, because the hotel business at large has



Profit Trend with Varying Percentages of Occupancy. European Plan Transient Hotels Only

of late found itself in a precarious condition due to over-building, architects will want to be particularly careful henceforth, when they are asked to design new hotels, to ascertain insofar as possible in advance whether there is a real need for a hotel of the size and type contemplated in the proposed location. Otherwise their prestige will suffer, for no architect who has his future to consider can afford to identify himself with a building that becomes a failure financially,—no matter how well it may have been planned.

In the second place,—and particularly in the smaller centers,—architects are frequently asked to accept stock in new hotel ventures as part or all of their fees for designing them. In such cases it is obviously of direct interest to architects to analyze the proposed hotels' profit possibilities. A careful survey of any proposed hotel's profit possibilities should be made in advance by competent and unbiased experts. I have been given access to a number of reports of this kind, and it is surprising how close their predictions have come in most cases to the actual operating experiences of hotels for which they were made.

There should be borne in mind the fact that it was never the purpose of the Foundation's survey to indiscriminately discourage the building of all new hotels. The hotel business is great and growing,—and has unquestionably become better stabilized in the last six months. Horwath & Horwath, hotel accountants and consultants, whose experience and statistical resources were of great value to the Foundation in the course of this investigation, issue a monthly bulletin showing the aggregate business of their hotel clients. For the past six months this report has shown that this year's business has been from 1 to 4 per cent *better* than the corresponding month of 1928, whereas during the same six months of 1928 the same group of representative hotels reported a total volume of business that was from 2 to 8 per cent *worse* than for the corresponding months of 1927.

Airports. The great number of airports (over 2,000, according to a recent estimate) that are now in operation or in process of construction throughout the country offer unique opportunities for new hotels in many instances, although it should be very carefully ascertained in advance in each case how well the hotels in the adjoining communities are equipped to serve the new classes of patronage that these airports are creating. The apartment hotel field is one which will bear careful scrutiny by the far-seeing architect. According to many authorities, developments of this character are still in their infancy, and it is a fact that the "apartment hotel idea" is spreading very rapidly from the larger to the medium sized cities throughout the country.

Modernizing. In my opinion there is an even greater opportunity for creative architectural service in the remodeling and redecorating of existing hotels of all types. Hotel men have come to realize that the best method of staving off competition from further new ill-advised hotels is through the modernization of their buildings, both interior and exterior. The architect who can make a presentable structure out of the "Early Yapank" type of hotel, which now dots our cities all too thickly, will indeed establish himself as having marked ingenuity and artistic skill. The financing of hotel remodeling operations is usually less of a problem today than the raising of funds for a new building.

Recent investigations (by Horwath & Horwath) have shown that the hotel business now ranks seventh in the United States in point of capital invested and number of employes. So long as its growth is directed along the proper lines, it will continue to grow in profits and prestige, for travel is tremendously on the increase, and "bed and board" are necessities which no traveler can do without. Because of their high ethical standards and detached viewpoint, architects are looked up to as leaders in all civic developments. For this reason they can do more than any other one group to guide the hotel growth of their communities into the most profitable and permanently safe and sound channels.

MAKING HOTELS FINANCIALLY PRODUCTIVE

BY

PRESTON J. BRADSHAW

ARCHITECT, OWNER AND OPERATOR OF THE CORONADO HOTEL, ST. LOUIS

THE hotel project as a product of the architect is purely an economic problem. This includes the relationship that design and artistic success may have with it. It is a financial product and exists only because of its ability to produce financially. It becomes a concrete product through the coördination of the owner (or let us speak of him in terms of his mouthpiece, the operator) on the one hand and the architect on the other.

As for the selection of the architect, he may be selected for his ability and experience in this particular line of endeavor; he may be selected because of his influence with the money interests or other similar controlling factors; or because of his natural ability as a salesman to interest the owner in his services. And he is usually chosen for either of the last two reasons. This architect generally thinks of his project only in terms of a facade and a typical plan. The first is usually stereotyped, and the latter a stock idea. He thinks only of a row of bedrooms with baths behind this, back to back in the accustomed manner. Having settled these two phases of the project, he is perfectly satisfied with it and considers the remainder of the work something which will just naturally work out. And actually, he has not even begun!

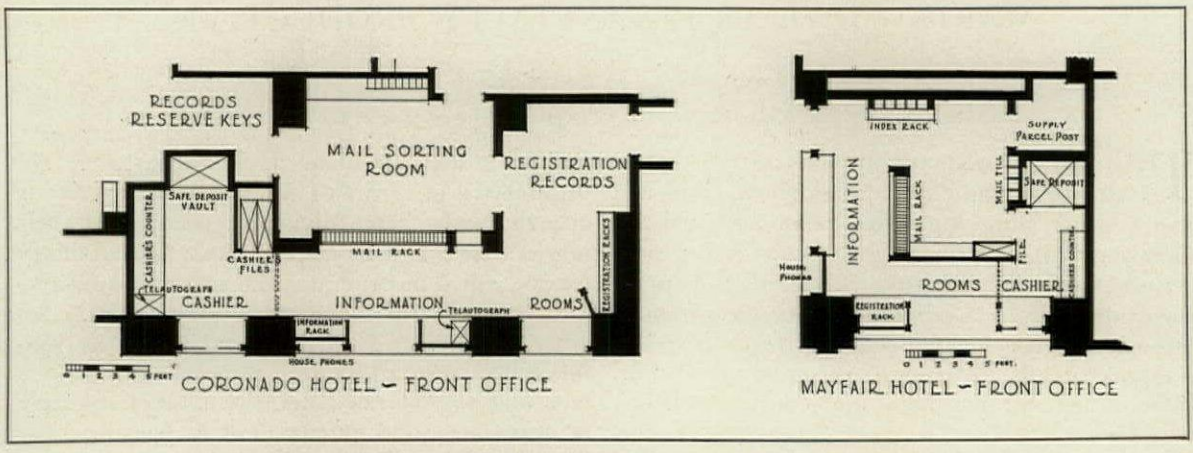
A horse racer, placing his hopes upon his horse to win the race, assures himself first of the jockey's understanding of the horse, and so it should be with the selection of the architect. The hotel product in its embryonic state evolves from certain visionary ideas in plans of the owner which the architect must mould into a physical mass of perfection from a viewpoint of beauty and productivity. So it is apparent that the architect must join in unison with the operator. He must realize that every portion of this work down to the smallest detail has some bearing on the success and operation of the hotel. Let us then, as an architect, remove our professional cloak and work in terms of the operator.

The hotel is defined in several ways: as a house for entertaining strangers or travelers; as an inn of the better class; as an abiding place of persons who are lodged with or without meals. Fundamentally the hotel is a domestic establishment. It will succeed only in proportion to its ability to provide domestic services and homelike convenience and environment. This enterprise can become profitable only when this purpose is fulfilled,—considering the guest from the moment he enters the establishment until he again passes through the door on his departure. All this service in terms of financial productivity is brought under three divisions: rooms and their service; food and its dispensation; and auxiliary service which incorporates the various remunerative services which the guest may desire. All other functions of the hotel exist only as subservient to one of these. Depending upon the type and size of the hotel, these functions vary in importance and extent. Let us consider only the normal transient hotel of 300 or 500 rooms.

Room Service. Furnishing guest room service is the primary and foremost purpose of the hotel. The moment the guest enters, the necessary service is in motion to accommodate him in as efficient and expeditious a manner as possible. Proper planning is absolutely essential for the delivery of this service to the patron without interruption, if the good will of the guest is to be obtained and held.

The Front Office. Let us consider first the desk or front office which is actually the heart of the organization. Strangely enough, the details of its operation and the equipment necessary are usually left to the last minute, with the result that the management must often re-adjust and install equipment after the hotel is in operation. In the medium-sized hotel the desk is usually divided into three sections,—registration for rooms, information, and cashier. Modern devices have greatly simplified the working conditions of the office, and their consideration is essential in the planning of the layouts. One of them is the telautograph or similar system which serves as the means of communication between the various departments, marking the arrival and departure of guests, the handling of charges, etc. It is desirable to sink the telautograph machine into the counters of the office so as to be level with the tops of the desks. Then there is the pneumatic tube system which is particularly necessary in the larger hotels. Charge accounts and C.O.D.'s. must reach the cashier immediately on execution, and in the larger hotels where certain departments are far removed this is quite important. Space must be provided in the cashier's cage for this service. There is also the cash register accounting machine, which has been adopted almost universally for the handling of accounts, because of its accuracy, speed, safety, economy, and the cleanliness of statements when presented.

The cashier's cage must have sufficient working space with a counter adjoining the desk. The proper space must be given the safe deposit vault, which should be placed in direct view of the guest



Front Offices of Two Hotels Arranged for Efficient Service
Preston J. Bradshaw, Architect

standing at the cashier's window. There must also be space for the guest credit files, which in some hotels reach very large proportions. These three essential departments of the office must properly incorporate and consider all the factors previously mentioned. They should be properly arranged with respect to one another, involving a minimum of lost motion. The accompanying floor plan of the Coronado Hotel front office is an excellent example incorporating all these requirements. It has proved very successful in operation; it is large enough to handle the maximum amount of business and yet sufficiently compact to be controlled at night by a minimum number of clerks. The essentials in the planning of the office are of necessity compactness, ease of operation, and service to the guest. The Mayfair Hotel layout is a particularly compact plan; however, it is not called upon to do the large volume of business which the Coronado Hotel office is required to do.

Typical Floors. Let us follow the guest to the typical floor. We will not attempt in this article to delve into furnishings, carpets, or fixtures, which are all in another realm of planning and maintenance. We might assume that an economical plan has been evolved, obtaining desirable rooms throughout. The exact grouping of furniture must always be considered in determining the possibilities of the room. It is not necessarily the square foot area that results in the desirability of the room, but rather the grouping of the furniture in relation to the shape of the room.

The question of materials and equipment for the typical guest room and bath is usually not thoroughly investigated and understood. However, the question of maintenance is directly involved. The painting of walls with a zinc paint not too roughly applied is most satisfactory, especially in cities where the smoke nuisance is a great evil. The walls can easily be washed, and if the shades are soft, the resultant appearance of the room can be made very pleasant and homelike. A full-sized mirror is essential in every bedroom. Enough electric outlets must be provided. These should be placed to conform to the pre-arranged furniture grouping. Radio equipment must be considered. The head-phone sets are not the most desirable. In their stead, we have arranged a built-in unit in the closet with a disc loud speaker placed behind a register at the ceiling. This eliminates pilferage of the sets on the part of the guests.

Bathroom Equipment. The bathroom should have a marble threshold to withhold water that may reach the floor. A stationary ice water faucet over the lavatory is better than a swivel type, as it prevents careless leakage. A full-sized medicine cabinet is preferable to a mirror and shelf. A pin rack is more desirable for towels than a flat rack. Pulling a towel hurriedly from a shelf usually causes the whole supply to fall. An ordinary 75-watt light on the medicine cabinet should be sufficient illumination for the bathroom, but by all means it should be controlled by a switch. It will save untold activity on the part of the engineer in replacing pull socket chains. There should be an electric socket near the medicine cabinet for the use of curling irons. These are some of the innumerable items which must be considered from the viewpoint of the operator and which are usually overlooked or not considered.

Floor Services. The typical floor should also have the necessary service in connection with it. The need of adequate helps' closets on each typical floor is imperative. There should be a maids' closet containing the slop sink, and also a toilet; the housekeeper will have better control over the maids if they can remain on the floors to which they are assigned. The linen closet should be large enough to provide an adequate supply of

linen, carpet sweeper, hairbroom, and supply baskets. There should be a telephone in each with buzzer signal and a light indicator to the corridor to be easily visible to the maid. It saves the housekeeper many steps and gives her the means of notifying the maid of check-outs. In most cases the service hall is of necessity very small, and the noise connected with it very objectionable, due primarily to the slamming of elevator doors. It is desirable to soundproof the ceilings of these halls. The service doors should have ball-bearing hinges and door checks.

In conjunction with the guest room service, there is the proportionately large organization in the "back" of the house which is necessary to produce and maintain this service. There are the departments under the control of the housekeeper, those under control of the engineer, the storage rooms, work shops, locker rooms, and print shops.

Important Storage. Large amounts of money are dissipated by many hotels because of the lack of storage spaces for the various departments where seasonable merchandise must be stored. In planning the hotel the architect usually is cramped for space when he begins to lay out the mechanical equipment and service rooms, and consequently the locker rooms and storage rooms usually suffer. It is well to keep in mind the great amount of waste which results from the improper storage of furniture. Every hotel should have an adequate furniture storage room. This item is too often omitted from the plans. The room should be large enough to store all the wicker furniture which is used either on terraces or in the lobbies, couches and chairs waiting for the upholsterers, bed ends, proper shelves for mattresses and racks for box springs, baby cribs which are usually kept on hand, and various other items necessary for the proper operation of a first class hotel. In conjunction with this, there should also be the upholsterer's shop, paint shop and repair shop. In a 500-room hotel it requires two upholsterers, starting a year after the opening of the hostelry, to keep pace with the deterioration of the upholstered furniture. Gas is usually provided in this department for glue pots, and various electric outlets are necessary. There should also be rack space with dustproof doors for the upholstering material.

There should also be a paint shop for the storage of paint, and also shelves and racks for the painting of screens, waste paper baskets and other such items as come under the painter's jurisdiction in addition to his wall work. The furniture refinishing room should immediately adjoin this shop, so that men can work in either department, depending upon the amount of work on hand. This department can become economically a very successful department, as I have learned from experience. On one occasion I was charged $1.50 per chair for the refinishing of 600 chairs which consisted of sandpapering, one coat gold lacquer, and one coat clear lacquer. Later I had a refinisher at a salary of $165 per month to refinish the same chairs at a cost of 35 cents each. This type of economy is possible in any hotel if the space is provided. I have found that having these departments, properly set up with the correct equipment, is an incentive for the manager to keep his furniture in good order, and at a minimum cost.

The carpenter shop should also be placed with this group. It should be of sufficient size for the storage of lumber, panel stripping, and crates. Practically every good sized banquet or convention requires special carpenter work, platforms, etc., the hotel profiting by using its own men and charging the guest.

It is desirable to place these allied service departments under the main roof, primarily because of the economy of this area if incorporated with the pipe and duct spaces, but also because of the available light and air, and the isolation from the rest of the building.

Housekeeper. Let us give the housekeeper's department its due consideration. A great amount of money can be saved if this department is arranged properly. There must be an intelligent spacing of the tables, shelves, and bins for the sorting and mending of linens. Space should be provided for the handling and storing of winter blankets, hangings, and rugs which are stored during the summer months. We must remember that the housekeeper must have under her immediate control the complete inventory of the "live linen storage" and the reserve. If the house is to include a laundry, it is advisable to have the linen storage, sorting, counting, and housekeeping department grouped with it to minimize passing the linen to and from these rooms. A laundry is a very desirable investment in any hotel operating above 400 rooms. It will save the hotel in the immediate cost of operation as well as in the saving of the linen.

Food Service. From the viewpoint of the owner, the food service should be the most important part of hotel operation. It is the most dangerous and may be the most disastrous from the financial point of view. Many hotel operators will disagree with me and minimize this statement. With the construction costs of hotels mounting to such high levels in recent years, and with the room rates on such a competitive basis, a hotel can survive only if it looks upon its food department as a source of profit.

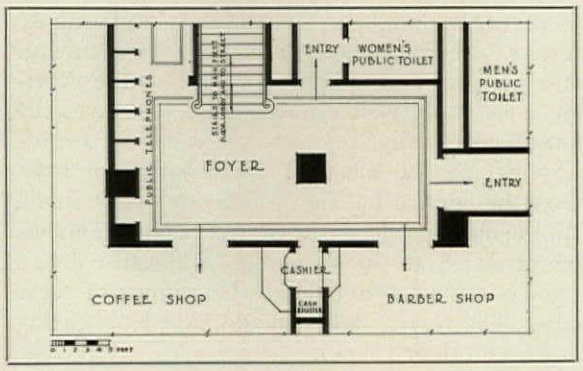
The planning of the kitchen, the type of dining rooms, the extent of service, and the kind

of equipment form an inexhaustible subject and vary greatly with local conditions. However, we can strike certain notes of warning and guidance that will assist greatly in an economical scheme and bring forth matters not always considered. We cannot say what kitchens are necessary or just how they shall be arranged. Every individual, no matter how experienced, has individual views which will not agree with those of another. My experience in employing chefs is that no two have the same ideas, so I have adopted a system of planning according to my own conclusions, and those connected with its operation will agree that it is in accord with their ideas.

Usually, with disastrous results, not enough space is left for the kitchen service, and the necessary equipment cannot be included. On the other hand, a kitchen may be too large and unwieldy to produce economical results. It is very true that a small crew in an ample space is more efficient than a large crew in a small space. The keynote of kitchen planning is centralization. It must produce a compactly arranged main kitchen with its secondary departments controlled efficiently from it; it must consider accessibility to the supply or steward's department; it must control the various lines of traffic necessary to operate the department; it must solve the important dish problem; it must, above all, take into consideration room service and banquet service.

A kitchen is normally provided with abundant range space, but is very seldom given sufficient refrigerated box area. After all, boxes are not expensive when properly grouped. The *garde manger* should have sufficient space for salads prepared in advance, dressings, cleaned fruits, cut butter storage, and numerous other items. A smaller crew can capably handle the peak load if there is sufficient space to store such dishes as can be arranged ahead of time. There should also be a refrigerator for the chef to store his prepared soups and vegetables. The *garde manger* counter should have iced *bain maries* of sufficient size and refrigerated space for cold plates and salad bowls. Similarly, the cook's section must have adequate hot *bain maries* and abundance of heated space for hot plates.

It is desirable to place the bakery and ice cream department close to the main kitchen; if not, it should be placed directly under the pantry where a dumb-waiter can operate between the two. The bakery should have long bins with marble tops in close proximity for the storage of raw materials. In addition, there must be wooden trays and kneading boards for the bread department. Electric ovens have been found very satisfactory. The ice cream department should have a good sized freezer box with direct expansion coils acting as shelves. This space is often made too



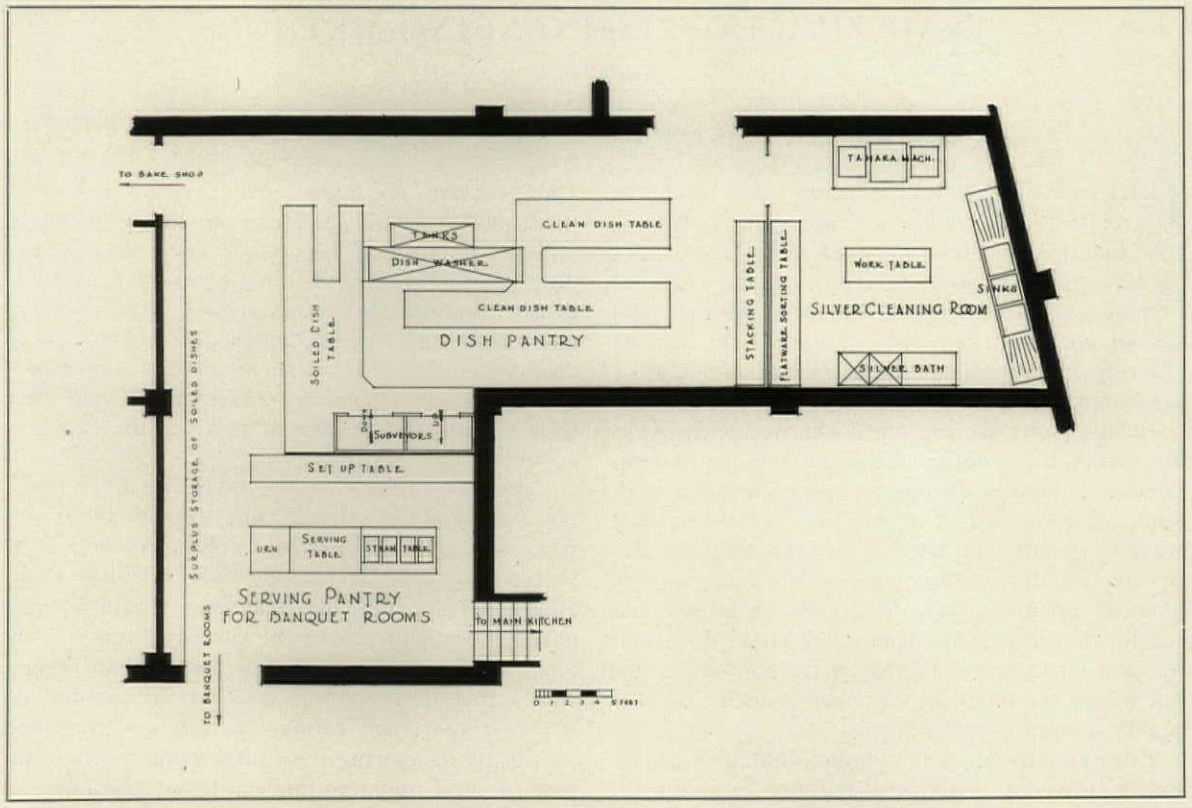
Basement Foyer of the Lennox Hotel, St. Louis
Preston J. Bradshaw, Architect

small where large banquets may have to be served. Bulk ice cream is kept in racks with sufficient capacity for at least 50 to 70 gallons' storage.

Consider the amount of motion saved if the store room can adjoin the kitchen. Here sufficient shelf space is provided for week-to-week canned goods, bottled goods, and all the other staple lines of food. It is in reality a complete grocery store under the control of the steward. If possible, the refrigerator storage boxes should lead off of his room, as they are also under the control of the steward. These boxes should be as large as possible to permit of greater buying volume. A bulk storage room may be placed on the larger level for barrel and case goods. Space should not be overlooked for the storage of china and glass. All these rooms must be directly under control of the steward, and everything for which he is responsible.

The dish pantry is always a problem. I have found it very desirable to place this department on the lower level from the kitchen. It takes the dirt and noise out of the main work room and permits of better storage of soiled dishes resulting from rush periods. There will be a consequent saving of labor if a smaller crew can operate continuously throughout the working day without choking the system. With the perfection of conveyors, it is really simpler than it sounds. At the Coronado Hotel, the dish pantry was part of the main kitchen, but later it was moved to the basement and operated from subveyors with much success. A layout of this room is presented herewith. If the dish pantry cannot be placed in a separate room, it should be well soundproofed.

When the general plan is decided, and the elevators and kitchen locations settled because of certain limiting conditions, let us hope that they are sufficiently close to each other to provide effective room food service. A proportionately large amount of revenue can be derived from this service, as an increase in price is made over the usual dining room charge. The space for room service should by all means be placed as close to



Plan Showing the Dish Pantry, Silver Cleaning Room and Serving Pantry of the Coronado Hotel, St. Louis
Preston J. Bradshaw, Architect

the service elevator as possible. One elevator should be set aside during the busy food periods for the exclusive use of this department. With this convenience, a waiter can make a complete trip in 10 or 15 minutes. The room should be large enough for 15 or 20 service tables, charcoal burners and a desk for checker or order clerk.

Where the banquet rooms are located on the same floor as the main dining room, a banquet department can easily be arranged with little expense as an adjunct to the main kitchen. It will require a long, low counter, one end equipped for hot plates and the other for cold service. Sufficient refrigerated space is necessary for the storage of fruit salads or desserts, which must all be prepared ahead of time. In connection with the hot service a hot *bain marie* for soup containers and two large broilers, which will take care of most banquets of up to 500, will suffice.

Shops and Services. In the general planning of the hotel there become involved all the auxiliary services which the operator should depend upon for their proportion of the revenue. In this respect he must look upon himself as a merchant surrounding himself with a maximum number of sales opportunities. Many operators do not realize this. Such departments as the barber shop, cigar shop, flower shop, and telegraph concession can become very profitable adjuncts. One must always consider the psychological effect upon the guest in locating them with respect to his environment. Strangely enough, in the Coronado Hotel the cigar shop is not anywhere near the main lobby but is located in a shop corridor adjoining which is a broker's office and which leads to the popular coffee shop. As a result, this counter does a large volume of business, and due to its location it also handles the checks for the coffee shop. The Lennox Hotel presents a successful grouping of such interests. One would not normally consider the basement a successful location for a barber shop in this particular project. But the successful grouping of shops serving allied purposes around a public basement lobby which serves as an entry to the coffee shop, popularizes this location. This lobby has a spacious stairway leading directly to the street and also to the lobby. In the accompanying plan of this grouping, note also the combination cashier's desk serving both the coffee shop and barber shop.

The entire procedure in the operation of the hotel is to economize as much as possible, and yet satisfy the guest. For, after all, a hotel exists only through the patronage of the guest, and whatever may be necessary to attract and invite this individual is a desirable investment. It includes such details as exterior illumination, brilliant furnishings, fixtures and decorations.

ANALYZING HOTEL FINANCING METHODS

BY

PAUL SIMON

OF HORWATH & HORWATH, SPECIALISTS IN HOTEL ACCOUNTING

IRRESPECTIVE of the beauty of a hotel, the architect's reputation will not gain if, from a cold blooded business point of view, the hotel's operation cannot result in profit. It may seem at first glance that the architect cannot possibly and should not be held to blame for all the factors entering into hotel operation entirely outside of his control and of his immediate responsibility.

In this paper we are not concerned with possible errors in layout, which may have caused increased expenses of operation or curtailed convenience and comfort to guests. We also do not want to go into the serious but frequent blunder of erecting the wrong type of hotel in a given location or under certain given conditions, but we do want to consider that hotel where the architectural structure is all that it is supposed to be, but where the financial structure is such that economic success is endangered.

Fees in Stock. Every hotel building, residential or transient, is a special building, usable ordinarily only for the one purpose for which it has been planned, and there is at least a strong moral obligation on the architect's part to be reasonably certain, that with proper management, the enterprise has a fair chance to succeed. This moral obligation becomes stronger in ratio to the closeness with which he has been in contact with the beginnings of the enterprise, and it is most pressing where and when,—as is so frequently the case,—the architect has been the,—or one of the,—promoters. In many cases he has to accept part or all of his fee in stock or other securities of the hotel and is expected to make arrangements of a similar nature with contractors.

"Value" and "Price." In all cases it behooves the architect to keep in mind that even the finest, most durable and well balanced construction may crumble under the load of a financial super-structure which is too heavy a burden. If a hotel building is erected, a new value is created. This "value," however, is not necessarily equal to the "price." The building may be worth in material and labor all that it has cost, and still be a liability rather than an asset, if the operation does not yield a proper return on the capital and in addition does not return the original capital during the economic (i.e., useful) life of the building.

Fundamentals of Financing. It is essential to limit ourselves in this article to the consideration of the most fundamental aspects of hotel financing which, however, must include an understanding of the hotel industry. It is a fact that 100 per cent occupancy over even a relatively short period of time is an impossibility in hotels, and percentages of occupancy exceeding 90 per cent (as found in office buildings under advantageous conditions) are extremely rare even in apartment hotels where leases of a year or more are demanded. In transient hotels, experience shows that an occupancy exceeding 70 per cent over a period of a year or more is the rare exception.

When arranging for the financing of a hotel, bonded liabilities should not exceed the point where the annual obligations arising in connection therewith exceed the earnings which will be available under the most conservative expectations regarding occupancy. In the case of transient hotels, the danger line is rarely lower than 60 per cent. It follows, therefore, that the amount of the first mortgage cannot be safely determined simply by measuring it in proportion to the total cost of land and building, and that the ratio of the interest and principal payments to the expected earnings is the more important factor.

Earnings' Ratio to Interest. Investment bankers and security commissions usually want the estimated earnings available for interest to equal from 2¼ to 2½ times the maximum interest. In the cases of hotels constructed and financed in recent years, the available earnings have attained that proportion in relatively few instances. The most frequent causes for the actual results falling short of those anticipated were:

1. Hotels built in excess of actual needs.
2. Mortgages too high in comparison with possible earnings, even if in proper proportion to the value (price) of the assets.
3. Principal payments too high or starting too early.
4. Over-estimating volume of sales.
5. Under-estimating operating expenses.

All five reasons strongly point to the necessity of there being a thorough and unbiased survey before arrangements for financing are made. Many times an extra story or two, an elaborate banquet room or other facilities and accommodations in excess of practical need have increased the cubic contents, and consequently the cost, and finally the borrowed capital to a point where the burden became too heavy.

The higher the mortgage the greater, of course, become not only the interest but also the amortization payments. These payments must be met, to avoid foreclosure or dispossession, and many a

good hotel project has been wrecked because the management, in fear of this sword of Damocles ever hanging over its head, busy to scrape together the money necessary to meet the payments, was afraid to make essential expenditures for promotion or upkeep and maintenance.

Bonded Debt and Stock. In financing a hotel one of the prime rules ought to be to keep bonded indebtedness at a level sufficiently low, so that all obligations in connection therewith can be met, even under the most disadvantageous conditions. If further financing is necessary, such requirements should be taken care of by the sale of "income debentures," or of some type of stock issue. It is the modern trend to combine such junior financing with privileges of conversion into common stock or with a bonus of common stock. A combination of this kind is logical and practical; logical because the greater risk involved entitles the purchaser to a share in the possible eventual greater profit, and practical because its salability is increased through the appeal to a public with increasingly speculative instincts.

Typical Financing. If we assume, for the moment, that the hotel is exactly right, i. e., that it fills a need in the community, that its size, layout character, appearance, type and location are 100 per cent good, that the management is capable and efficient and that, therefore, the volume is in proper proportion to the available accommodations, and that the operating profits are in the proper proportion to the volume (all of which is quite a presupposition), then we can arrive at imaginary ideal ratios of the various types of financing to the related types of investment.

This table shows a normal ratio of the various assets of a hotel to the total investment:

Land	21.00%
Building	59.00
Furniture and Fixtures	13.50
Deferred Charges and Prepaid Expenses	1.00
Current Assets	5.50
Total	100.00%

Correspondingly, we give listed here a typical set-up of the means of financing the requirements as found in recent hotel projects:

First Mortgage Serial Gold Bonds	52.00%
Second Mortgage (payable in five years)	24.00
Unsecured Notes	5.00
Stock (preferred and common)	19.00
Total	100.00%

The type of financing just outlined shows that the First Mortgage Bond issue equals 65 per cent of the value of land and building or 52 per cent of the total requirements, which is the usual proportion, but since the actual investment, as represented by the outstanding stock, equals only 19 per cent of the total financial requirements, it is necessary to obtain further financing by arranging a second mortgage and, in addition thereto, evidently part of the furniture and equipment purchases has been paid by notes. These notes necessarily are unsecured notes, because the investment house underwriting the first mortgage issue generally and justifiedly insists upon clear title for furniture and equipment, the reason being that, in the case of a foreclosure, the uninterrupted conduct of the business would be jeopardized if a third party had title.

The great danger in financing of this type is that, not only interest, but also principal payments on second mortgage and notes must be met during the initial years of operation. Even under the most advantageous conditions a new hotel requires a period of seasoning and ripening and finds its stride only very rarely before the third year of operation. Since the construction period consumes generally at least one year, a normal business cannot be expected sooner than four years from the date of the issue of the mortgage loans. It follows, therefore, that even if in later years the hotel might be able to carry the burden, the first few years would probably end in disaster. *A hotel consequently cannot be considered to be soundly financed if heavy payments are obligatory in the first three or four years.*

Inasmuch as a first mortgage usually cannot, and should not be secured in excess of 65 per cent of the combined value of land and building, and inasmuch as these items equal approximately 52 per cent of the total financial requirements, sound financing would call for more than 19 or 20 per cent of owner's investment. The difficulty is that the rate of return is hardly sufficiently attractive for a cash investment of nearly 50 per cent without security greater than that offered by capital stock.

To see just what that means is easily shown by a simple example of arithmetic. For example, an operator or an operating corporation has in mind the promotion and erection of say a 100-room hotel, and this hotel, including land, building and equipment is to cost $600,000. The earnings, before interest and depreciation are deducted, are expected to be $60,000. If $500,000 of the total investment is borrowed at an interest rate of 6½ per cent, amounting to $32,500 per annum, the profit available for depreciation and dividends would be $27,500 or 27½ per cent on the owner's actual investment of $100,000. If $300,000 were borrowed, even at the lower interest rate of 6 per cent, amounting to $18,000 per annum, the return available for depreciation and dividends would be $42,000, representing 14 per cent on an investment of $300,000. Thus, the inclination of the borrower to obtain mortgage

loans just as high as possible, is not unnatural, even though it is dangerous and has led generally to failure, because in the case of the $500,000 loan, the cash requirements would amount to 6½ per cent for interest plus 2½ per cent for reduction of the capital indebtedness, or $45,000. That proportion to earnings usually is not only too heavy a burden in the initial years, but involves great risk in any later year when, as happens in any industry, a lean year or a period of lean years has to be weathered. The experience of the last few years has seen full proof of this fact.

The consequence is that numerous hotels have been taken over by trustees for the bondholders. Equities of the owners (stockholders) are wiped out in most of these cases. Creditors on open accounts have only slim chances of recouping, and in certain cases it is rather doubtful whether or not 100 per cent of the first mortgage bonds can be recovered. In most cases so far the purchasers of first mortgage bonds have not lost either principal or interest, where bonds were bought from the very high class investment houses, because those investment bankers of high standing and very strong resources, so far, have protected them and are carrying the burden.

However, even these strong institutions naturally have their limitations, and as a consequence they have shut tight, and it is very difficult indeed today to find underwriters for first mortgages even for meritorious hotel projects. That condition, as far as existing hotels are concerned, is to be welcomed, because there is no doubt that in most parts of the country, the industry has been overbuilt. It also has the further advantage that most probably it will lead to sounder financing when the market opens again.

An ideal plan of financing a hotel project amounting to $1,000,000 would be:

Cost of Land		$200,000
Cost of Construction (including architect's fees, contractor's commission, surety bond, etc.)		600,000
Interest for Temporary Loan during Construction, 6 per cent on $600,000		36,000
Furniture and Fixtures		124,000
Taxes, Other Expenses, etc.		40,000
Total		$1,000,000
To be financed in this way:		
Institutional Mortgage Loan	$450,000	
(Less: Discount of 3 points and expenses)	20,000	
Net Proceeds		$430,000
Income Debenture Bonds with Conversion Bonds	$300,000	
(Less: Discount of 10 points)	30,000	
Net Proceeds		270,000
Preferred Stock, 1,000 shares		150,000
(One share of common stock given as bonus with each two shares of preferred stock)		
Owner's Investment—Common Stock, 3,000 shares		150,000
Total Proceeds		$1,000,000

The advantages are obvious. To provide (instead of financing as just outlined) a serial bond mortgage issue, sufficient to obtain proceeds of approximately $700,000, the total issue, including discount (higher by about 6 to 8 points than in the case of an insurance loan) and interest during construction, the total loan could not be much less than from $830,000 to $850,000 thereby increasing the cost of the project. Furthermore, yearly obligatory payments for interest and amortization payments thereon would amount to at least $75,000, whereas in the case of a combination of an institutional mortgage, and junior financing, only the failure of meeting the interest on this mortgage (namely $27,000) could result in foreclosure. Usually no, or a very nominal, amortization is required during the life of the insurance loan, and income debenture bonds have as security only the income, so that the danger of a levy against the property is slight indeed. Nevertheless, these debentures should interest the investing public, first because there would be much less danger of non-payment of interest on account of the elimination of amortization on the first mortgage, and secondly because the conversion warrant gives an opportunity of sharing in the ultimate profits in the enterprise in the eventually expected appreciation of the property.

The investment banker usually has a strong aversion against leasehold mortgages. In my opinion, that aversion is not entirely justified. Especially in large metropolitan cities, desirable hotel locations require land so valuable and expensive that sometimes it is almost impossible to purchase it, or if purchased it increases the need for a so much enlarged mortgage, and consequently so much increased capital payments, that we have just that situation against which I have warned in this article. If a lease on such ground can be had on reasonable terms, it means that, in fact, interest only and no amortization is paid.

Financing by land trust certificates means that part of the requirements, which equals the value of the land, is for practical purposes very similar to an arrangement for a lease on the land and a subsequent leasehold mortgage. This form of financing is rather new, used only in a few states to any extent, especially in Ohio.

The architect should realize,—

1. The necessity of a thorough and unbiased preconstruction survey, to arrive at an authoritative estimate of the earnings possibilities of the individual projected hotel, instead of founding calculations of the forecast simply upon average ratios of the industry.

2. The advisability of keeping bonded indebtedness to that low point where even unexpected disappointment in the earnings will not make it impossible to meet obligatory payments.

PLANNING THE HOTEL FOR MAXIMUM FLEXIBILITY AND UTILITY

BY

WILLIAM HULL STANGLE

THE hotel business is essentially an industry; as such it involves the application of the fundamental principles of economics, and calls for their ingenious application by the architect in the design of the hotel. These fundamental principles are founded on experience gained in the operation of hotels and are the factors determined by the natural research of observant operators in the laboratory of the business,—actual experience.

As an industrialist, the operator today buys his room space at a price and merchandises it at a profit. Likewise he purchases raw food, puts it in storage, refines it in the kitchen (for cooking is an art of refining) and merchandises the resultant product in the dining room, coffee shop, grill and other places. The steward is the purchasing agent, the chef the refiner, and the waiter the salesman. The menu is an advertising medium, and the food is sold "ready-made" (table d'hote) or "made-to-order" (a la carte). Shop or store space is sold at a relatively high rate of profit to offset the land-carrying charges, and public spaces are required to insure a maximum return. To do justice to the industry the operator must have a properly designed and well balanced house. The design must meet the demands for maximum flexibility and utility, since otherwise the house is overburdened, and a reduction in profits will result. Proper equipment is of paramount importance. Of the equipment, the elevators and kitchen are the backbone of the hotel. The elevators serve the guest rooms, and the kitchen serves the eating places. The best *parti* will result when the building is designed around the elevators and the kitchen.

Profit. As the hotel must make a profit, it is necessary that the purchase price of the building be in proportion to the possible income. A survey should be made of competing hotels and of the possible patronage, from which the room rates for the proposed hotel should be established. This becomes the first economic factor in the design of the hotel. A cubic foot of space in a given locality will cost a certain unit price. Knowing the possible room rate, an experienced hotel specialist can determine the size of the room and the type of equipment most suitable for the patronage anticipated. The type or character of the house will predetermine the public space requirements.

Standard Requirements. Since there are certain fundamental principles involved in the economic equation, it is logical that standardization be a factor in the design. Several chain operators have found it to their advantage to standardize their requirements. The best of these requirements are used as a basis in this discussion. In most instances the architect, in designing a hotel, looks for a satisfactory typical floor plan. Having achieved this, he designs the rest of the building to suit this typical plan. Let us therefore look into the designing of the guest rooms.

Guest Rooms. The majority of hotels today are high grade commercial houses that a few years ago would have been called de luxe. Again the advanced requirements of the patron have become somewhat standardized, and one must meet this demand. For purposes of reference, typical guest rooms will be designed as C, B, A, AA.

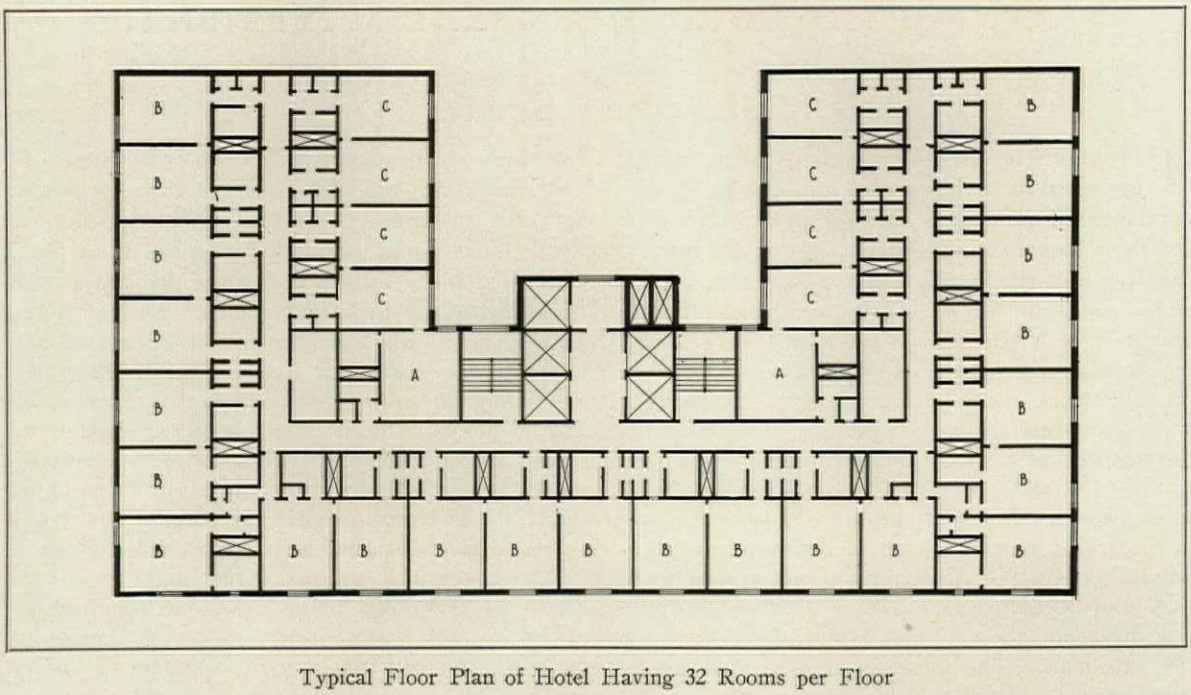
The C room is laid out 9 feet wide and from 13 to 14 feet long, being of ample size for all furniture and space for the guest. A double or three-quarter bed can be used, allowing flexibility in that double occupancy may be had when required, although it is essentially a "single" room.

The B room is 11 feet, 3 inches wide and from 13 to 14 feet long. This will accommodate a double or twin beds with the usual required dresser, side chair, overstuffed chair, night stand and fixtures. A combination dresser and writing desk is used by several prominent operators, saving as it does in floor space and furnishing cost.

The A room is 12 feet, 6 inches wide and from 13 to 14 feet long. This is typical of the B room excepting in the greater width. It is usually furnished slightly more elaborately, and is best arranged as a corner room or as a parlor en suite with a B or a C room.

The AA room is from 12 feet, 6 inches to 14 feet in width and from 16 to 20 feet in depth. This is in reality a de luxe room as is incorporated in the better houses where a substantial resident guest business is anticipated. These rooms are best equipped when closet beds are used, providing a parlor or living room by day and a bedroom at night. This flexibility results in securing a higher rate and resultant increase in profit. The writer predicts that some operator with real vision and a pioneering spirit will some day erect a de luxe hostelry with this type of guest room. It is logical, practical and more refined than the usual "bedroom" guest chamber.

All guest rooms should have telephones connecting through the house switchboard. Where resident guests are anticipated, additional provision should be made for private telephones. Radio in every room is becoming a part of the service to the guest. The writer has recently designed and recommended an elaborate system for

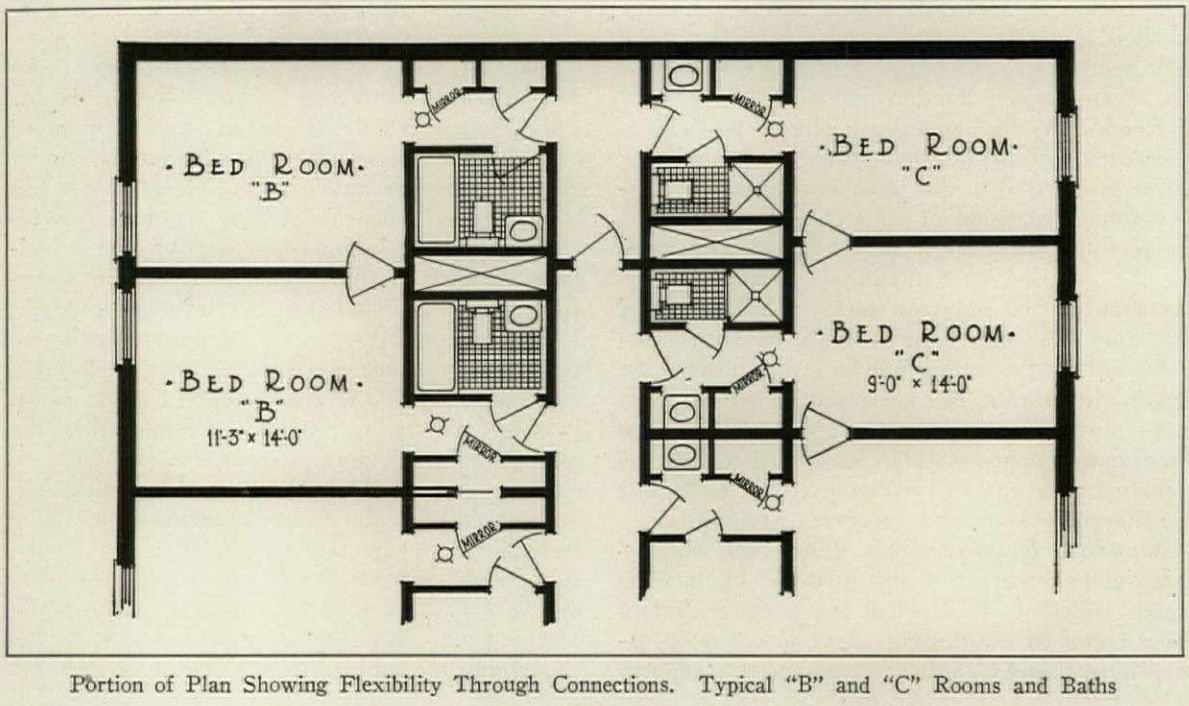


Typical Floor Plan of Hotel Having 32 Rooms per Floor

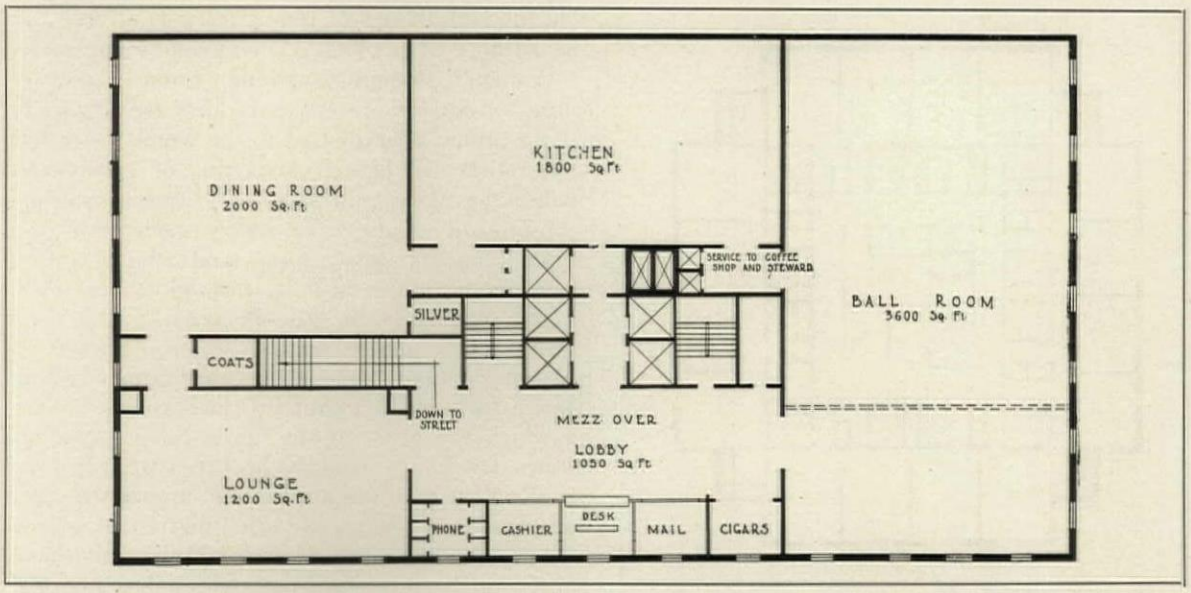
a southwestern hotel providing at least two radio programs,—a Victor record program, and house music,—in every room. This particular city has little theatrical, motion picture, or musical entertainment, and the guest must be entertained to keep him from going to the next livelier town.

Baths. Americans are "bath-minded," and any modern house should have a bath in every room if it is to have distinction and meet the demands of the present patronage. AA rooms should have combination tubs and showers. A rooms should have tub baths and shower heads. B rooms should have at least tub baths, and C rooms at least shower stalls. A few C rooms may, if en suite, have a compartment for lavatory and water closet.

A survey, of course, would indicate the proportion of rooms of the various sizes to incorporate in the design of the hotel. An average for a high grade commercial house would be from 10 to 20 per cent A rooms, 40 to 60 per cent B rooms, and 20 to 30 per cent C rooms. In most



Portion of Plan Showing Flexibility Through Connections. Typical "B" and "C" Rooms and Baths



Main Floor (above Stores) of Hotel Shown on Opposcite Page. Excellent Control and Room Relationships for Flexibility

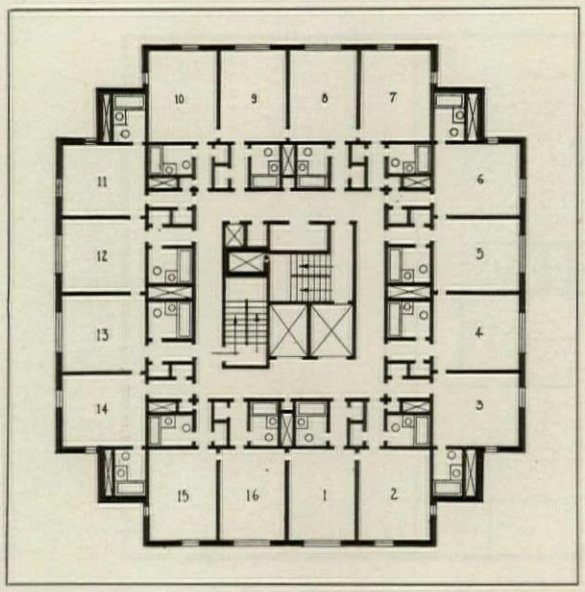
instances, the B rooms are the best sellers and provide maximum flexibility and utility at a relatively lower initial cost. There is a growing demand for shower baths, particularly by men travelers and the younger set of women. There should be a goodly proportion of rooms providing shower facilities. Considerable importance should be given to the ventilation and heating of the bathroom, especially where the bath is inside. Air changes of from two to five minutes are necessary. Warmer climates and seaboard hostelries need greater ventilation.

Room Facilities. A frequent fault of the higher type of hotel is inadequate closet space. This should certainly be provided. The tourist business and growing convention traffic demand maximum flexibility and utility. Communication between rooms to provide accommodations for complete families and groups of guests is becoming more essential. The accompanying sketches will show several means by which this may be accomplished. All rooms today should have full-length mirrors in the door panels of the closets. The arrangement shown has proved very practical. Running or circulating ice water is now a necessity and not a luxury. Every guest expects it and resents the tipping nuisance of bell boy ice water service. Medicine cabinets are to be found in every good bathroom, which is also provided with towel racks, hot water bottle hooks, towel hooks, bottle openers, integral electric lights, and convenience outlets. The traveler today is bent on an elaborate toilet before the day's work or journey or before retiring. Several modern houses catering to tourists and women guests have seen fit to abandon the old ideas and are providing facilities for washing, drying and ironing lingerie, hosiery and gloves, handkerchiefs and small pieces.

Floor Service. Interior corridors need ventilation and are too often stuffy and poorly ventilated. All guest room floors should have adequate linen storage space, maids' closets, slop sinks, and general storage and fire protection equipment spaces. Where room service is a feature, there has been a tendency to waste space by having individual pantries. This is unnecessary, and all such service should be handled directly from the kitchen by service elevators and special service equipment.

Waste Space. Parlor suites and the de luxe AA rooms depend, in the design, upon the findings of the survey. The architect should always bear in mind the facts that rooms must be rented, and that every vacant room means a definite loss. There is too much tendency toward designing monumental structures with waste space and inflexible operation instead of common-sense, practical planning. And, too, the unfortunate architect is often controlled by the whims, ego and extravagance of an over-optimistic operator or owner who insists on having monumental evidence of his greatness while he ignores the weakness of his pocketbook and the relative loss in future income. The community-financed hotel also invariably becomes involved in financial difficulties, because the citizen committee insists on burdening the project with oversized dining rooms, lobbies and so-called "civic rooms," the latter being costly and used less than other spaces.

Maid Service. Referring again to guest room space, it is well for the designer to remember the "rule of eight." The average maid can handle



Typical Floor Plan of an Ideal 100-Room Hotel, 6 Floors and Pent House. Sixteen Rooms Can be Cared for by One Maid

16 or 17 rooms; 16, 32, 48, or the like rooms per floor, is ideal. On the other hand, 24, 40, or the like is satisfactory, as one additional maid can handle eight additional rooms per floor for two floors. Reference is made to the accompanying sketches for typical plans of a practical nature.

Sample Rooms. In commercial houses, sample rooms should be provided, but in de luxe houses there is strong opposition to this practice. In face, some de luxe operators will not tolerate them, while others with an eye to business, cover up their practice by referring to these rooms as "salons," "galleries," etc. Accompanying sketches show ideal arrangements for the average house.

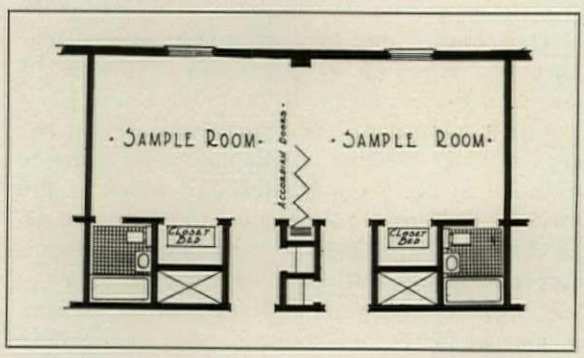
Public Space. Next to the guest rooms, the public space is most important, for if oversized it can, and frequently does, ruin the chances for profit. The entrance should always be designed so that it naturally invites the guest to enter the hotel. It should be a "one-man control" entrance, and double entrances are taboo. A double entrance should be provided only if the two connect before the stairway or entry to the business lobby is reached. Revolving doors or double vestibule doors should always be incorporated to prevent blasts of cold air from the outside. A hotel entrance is a busy place, and it can become a nuisance if not properly designed.

Old time hotels provided spacious lobbies, but that day is passing. The smaller business-like lobby reduces the number of "lounge lizards" and non-paying guests. In its stead a comfortable lounge adjacent to the lobby is coming into play, for it provides a more dignified atmosphere for the increasing number of women travelers and the better class of men guests. It affords the opportunity of providing a homelike atmosphere.

Women's lounges, smoking rooms, "powder puffs" or cosmetic rooms and toilets are now parts of the public area allotted to the women traveler. The toilets can be self-sustaining or even profit makers by using coin locks or arranging concessions to attendants. The men's wash room and toilet is an old time adjunct and affords an income to the house, usually through concessions, or in a smaller house by coin locks.

One of the newest features incorporated in an eastern de luxe house is a "meditation" room. Here is provided a beautiful small room, Gothic, in which any guest of the house can express his or her devotion to God, be his creed what it may, in silent meditation and in an appropriate atmosphere. Nurseries for the children of guests will be found in a few de luxe hostelries and have in general been profit-makers through a nominal fee or concession arrangement. Dog kennels have also been profitable in several urban houses, as there is a veterinary in charge, and a special cuisine for dogs is available at fashionable prices.

The dining room, coffee shop, banquet hall and other food-serving spaces present a difficult problem for the architect. It is the writer's opinion that no architect should take the responsibility of designating the space required for this business. Only an exhaustive survey can predict the food business and then only on a comparative basis with the conditions in the community and kindred communities well in mind. However, for the average house, there is a tendency to reduce the dining room space and increase the coffee shop area. This is indicative of the growing "grand American rush." One authoritative operator averages one seat in the dining room for every two guest rooms in the hotel and one seat in the coffee shop for every guest room in the house. The writer particularly warns the lay hotel architect not to definitely follow such a rule of thumb method. Put it up to the operator, and endeavor to get a survey made to secure the best results.



Sample Rooms Designed for Maximum Flexibility and Multi-use, 44-inch Doors to Admit Trunks

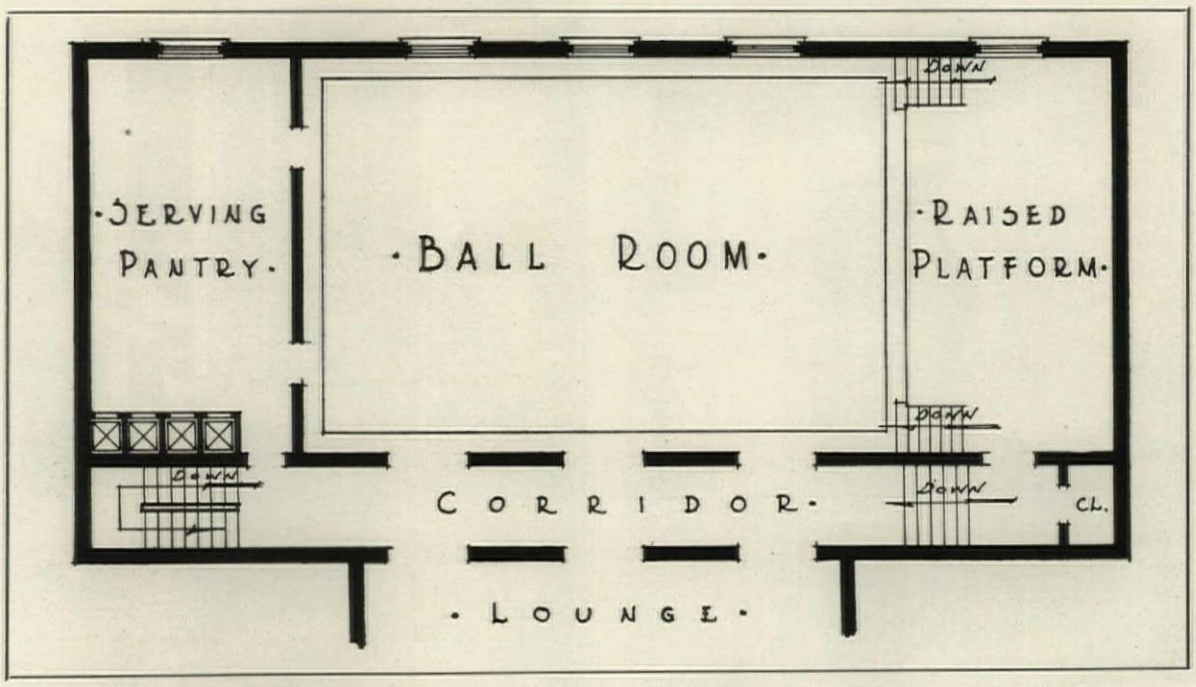
The banquet hall, ball room and civic room are usually one and the same. Local conditions alone can predict the size required. The writer recently recommended a combination room which is shown in the accompanying sketches. This room can be used as a dining room, banquet hall, ball room, auditorium, grill with dance floor, and for civic organization meetings and conventions. It is not intended as a compromise, but in the particular instance it meets the demands of a middle-sized city with varied hustling activities. Another sketch shows a satisfactory arrangement for a kitchen serving a dining room, ball room and a coffee shop below. In this case the ball room is used for many small affairs of high social caliber, and the coffee shop is of less importance.

Kitchen. Too much cannot be said about the kitchen, and volumes have been written about it. A real kitchen expert should always be consulted. Pantries often solve problems of food handling. Storage of food, too, is a broad and varied subject, too lengthy for discussion in this article. There is one thing for every architect to remember; whenever possible design your building so that food will travel in a horizontal plane, and reduce the vertical travel to minimum if you cannot eliminate it entirely. In keeping with the modern trend of discussing Prohibition, it may be in order to point out the resultant change in hotel planning since the elimination of the bar and cafe. In days gone by the bar made a huge profit and helped carry the land charges. Today these charges must be met in some other way.

Shops and Concessions. Several operators require that the design shall provide sufficient store or shop area to return at a fair rate of rental at least 10 per cent of the cost of the land, or in case of a leasehold enough to carry the lease and pay taxes and the like. In some instances this is impossible, wherein the operator must adjust his rates to meet the difference. In one case the writer succeeded, because of peculiar local conditions, in obtaining 20 per cent of the land value as the annual gross store rental. Other concessions such as valet, florist, barber shop, beauty parlor, telephones, telegraphs, porters, coat checking privileges and the like depend on conditions.

Stores and concessions should be made as flexible as possible to provide for facility in arranging the space to suit the tenants. A satisfactory solution in obtaining bids and letting contracts is to put in an allowance for partitions and the like and to adjust this as the work is completed. There should be coöperation between the renting agent and the architect.

The basement of a hotel is a factory and storage area. Here are housed all the mechanical equipment, such as the heating and power plant, fuel storage, laundry, incinerator, central vacuum cleaning system, refrigeration plant, steward's storage, air conditioning and ventilation apparatus, helps' locker rooms, helps' food space and kindred areas. Frequently space is provided for storage for the shops or stores. One eastern hotel has made a good profit with fur storage facilities in connection with a high class furrier shop.



Ball Room Planned for Multi-use. Projection Booth and Radio Control are Placed Over Serving Pantry Microphone Pick-up and Accessories are at the Raised Platform

FEATURES THAT MAKE HOTELS PROFITABLE

BY

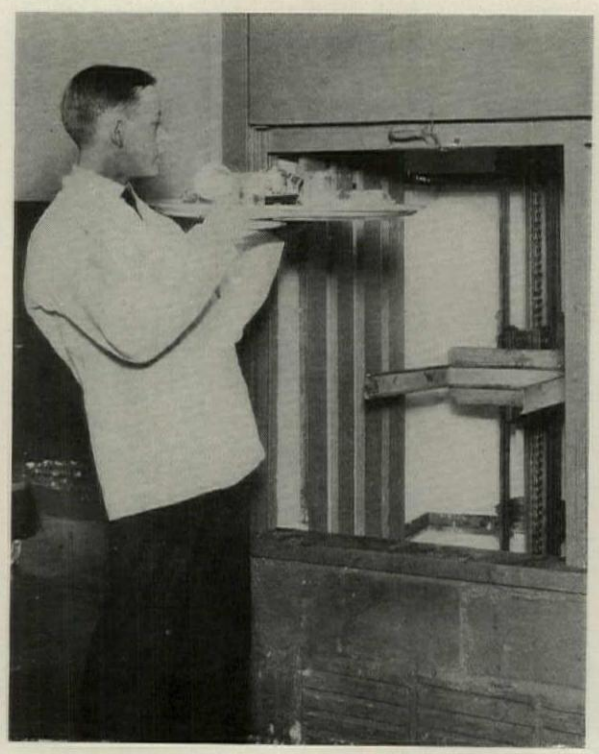
J. O. DAHL

HOTELS exist primarily for the sale of food and shelter. A building constructed for this purpose is seldom flexible enough to serve other commercial needs, and therefore the architect is faced with a situation that is unique. He must put into the structure that which will please the public at present and also 15 years hence. Obsolescence sets in early. Many hotels not over 10 years old are obsolete today because structurally they cannot be remodeled to meet modern demands. Within a mile of my office there is an example of beautiful hotel architecture that costs the operator $32,000 a year due to the loss of ground floor rentals. It is impossible to build in stores. Not a block away there is a successful hotel that runs its labor costs up $3,200 a year because the kitchens were not made large enough to give economical room service.

Next to planning a hotel that can be operated economically, is the necessity for building into it features that draw patronage. In a new hotel the advertising appropriation usually totals from 2 to 5 per cent of the first year's estimated gross revenue. It may, and often does, cost from a dollar to a dollar and a half to get each new patron. It is obvious, then, that the "repeat" guest is the patron who assures a profit. Therefore, the hotel needs features that have advertising value to bring in new guests and to so please its patrons that they will return frequently.

The list which is a part of this article is based on interviews and letters from hotel managers. For two years one of my stock questions has been, "If you were building a new hotel, what would it contain?" And in several hundred new modern hotels I have followed the success or failure of features listed. Many factors govern the value of the data. Transient hotels that sell rooms at $1 to $2 a day, would be over-equipped if each room had a full-length mirror, colored awnings, a room clock and a tailored closet. But another hotel a few blocks distant might succeed because of having such features.

Builders and promoters often display a strange lack of knowledge as to what kind of a hotel should be built. All too often a practical operator is not called in until the house is ready to open. It is under such circumstances that an architect must guard his future standing. The list shows the features advocated by managers of hotels. But it cannot, in a limited amount of space, show where and when they are advisable or essential.



An Efficient Tray Lift Speeds the Room Service

Well Equipped Closets with Convenient Mirrors

This can be determined only after a study of location, potential clientele, competition, price range, and service demands.

Structurally, managers do not look forward to many changes over those recently made. Soundproofing is essential to the future success of hotels that now furnish entertainment. The manager who can offer "noiseless hospitality" is assured of a high house count. If the "sun-tan" vogue continues, guests will pay extra for the privilege of having window glass that admits ultra-violet rays. Outside baths, casement windows and a sprinkler equipment are sales features of peculiar value to different types of hotels, but weather strips and central cleaning cut costs.

Hotel operators agree that the greatest advance in providing hospitality features will be along electrical lines. Television is around the corner. Radio in every room is here to stay; and the modern bathroom looks like a cross between a gymnasium and a hospital. But it is not at all unlikely that future hotels must provide facilities for exercises, violet-ray machines and other health equipment. "American life centers around the bathroom," said a famous French visitor upon his return to France. What he said in jest is rapidly becoming the truth. A beautiful bath with modern facilities for luxury and comfort is one of the best sales features. L. M. Boomer, president of the new Waldorf-Astoria Corporation, realizes this. The baths in the apartment suites of his new hotel will contain equipment found now only in the homes of unusually wealthy people. Women especially appreciate beautiful bathrooms, and they comprise at least 25 per cent of the patronage in American hotels.

Mechanical ventilation is today one of the best sales features in a modern hotel. In five years it will be impossible for a hotel to compete unless it has this equipment. This will also be true of temperature control, self-leveling elevators, and in apartment and residence hotels, incinerator equipment. The latter is modern and economical in operation.

Guests in the modern hotel expect speedy service. Therefore, it is essential to provide means for instant communication and transportation. Also they want doors that can be unlocked easily, rooms that can be found quickly unaided, parking space or a garage for their cars, overnight pressing service, one-day laundry service, bath tubs that fill and drain quickly, mixing faucets, good lighting, and the services of such departments or concessions as the barber shop, beauty parlor, soda fountain, drug store and library. Determining what they will want five years from now is the great problem of those who design and build hotels today. If such features are not found on the list it is because even the vivid imagination of many managers has failed to visualize a more modern and luxurious hotel than one including a composite of all the listed features and facilities.

COMPARATIVE VALUES OF CONSTRUCTION AND EQUIPMENT FEATURES THAT MAKE FOR A POPULAR AND PROFITABLE MODERN HOTEL

Key
E—Excellent.
G—Good.
X—Fair.
O—Of little value.

	Apartment Hotel	Residential Hotel	Club Hotel	Resort Hotel	Transient Hotel
I. Structural Features					
Soundproof construction	E	E	E	G	E
Central cleaning	E	E	E	X	E
Ultra-violet-ray glass	E	E	E	E	G
Outside baths	E	E	O	G	X
Weather strips	E	E	E	O-1	E
Casement windows	E	E	E	E	E
Double connecting doors	O	O	O	E	E
Sprinkler system	O	O	O	E	O
Laundry chutes	E	E	E	O	E
Rubbish chutes	E	E	E	X	E
Beautiful entrance	E	E	E	X	E
Wood-burning fireplaces	E	E	E	E	O
II. Mechanical Features					
Temperature control	E	E	E	E	E
Self-leveling elevators	E	E	E	O	E
Incinerator	E	E	E	E	E
Circulating ice water	E	E	E	E	E
Mechanical ventilation	E	E	E	O	E
Air conditioning	E	E	E	O	E
Automatic door checks	E	E	E	X	E
Large drains in baths	E	E	E	E	E
Rustless hot water lines	E	E	E	E	E
Water softener	E	E	E	E	E-19
III. Bathroom Features					
Silent flush toilets	E	E	E	E	E
Automatic shower mixers	E	E	E	E	E
Color in bathrooms	E	E	E	X	G
Mixing faucets	E	E	E	E	E
Built-in bathroom scales	E	E	E	E	X
Steel medicine cabinets	E	E	E	E	E
Enclosed showers	E	E	E	X	E
Tub and shower combination	E	E	E	E	E
Heated bathrooms (all year)	E	E	E	O	X
Hot water bag hooks	E	E	O	E	E
Bathroom clothes hooks	E	E	E	E	E
Built-in bottle openers	E	E	E	E	E
Chairs over toilet seats	X	X	O	O	O

Key

E—Excellent.
G—Good.
X—Fair.
O—Of little value.

	Apartment Hotel	Residential Hotel	Club Hotel	Resort Hotel	Transient Hotel
IV. Communication Facilities					
Mail chute	E	E	E	O	E
Convenient telephone outlets	E	E	E	E	E
Servicing doors	E	E	E	X	E
Chauffeur signals	E	E	X	O	X
Public telephones	E	E	E	X	E
Intercommunicating system	E	E	X	X	E
Tubes, pneumatic	E	E	E	O	E
Teletype or telautograph	E	E	E	E	E
V. Room Equipment					
Friction door hinges	E	E	E	E	E
Modern door locks above knobs	E	E	E	E	E
Luminous door numbers	E	E	E	E	E
Radiator enclosures	E	E	E	E	E
Ventilated doors	E	E	E	E	E
Colored awnings	E	E	E	E	E
Rolled screens	E	E	E	E	E
Cedar closets	E	E	E	O	O
Full-length mirrors	E	E	E	E	E
Closet beds	E	E	E	O	O-6
Wall safes	E	E	E	O	O
Built-in features	E	E	E	O	X
Room clocks	E	E	O	O	E
Door bolt switches	X	X	E	X	E
Tailored closets	E	E	E	E	X-16
Carpet nailing strips	O	O	E	O	E
Drapery hardware	E	E	X	X	X-18
VI. Special Rooms					
Club rooms	O	X	E	X	E
Convention halls	O	O	X	X	E
Gymnasium	E-3	E-3	E-3	E-3	E-3
House laundry	E	E	X	X	E-7
Barber shop	X	X	X	E	E-8
Beauty parlor	E	E	X	E-8	E-8
First aid quarters	X	X	X	X	X-4
Children's play room	E	E	O	E	E-10
Rooms for guests' servants	E	E	O	E	O
Lockers for guests	E	E	E	O	E
Specialty shops	E	E	E	E	G
Private dining rooms	X	X	E	O	E
Banquet hall	O	O	E	O	E
Wrap checking rooms	X-9	X-9	E	O	E
Public dressing rooms	O	O	X	O	E-14
Sample rooms	O	O	O	O	E
Public toilets	O	O	X	O	E-15
Employes' locker rooms	E	E	E	E	E
Apartment suites	E	E	X	E	E-17
Storage rooms	E	E	E	X	E
Paper baling room	E	E	X	X	E
Maids' floor closets	E	E	E	E	E
VII. Departments or Concessions					
Swimming pool	E-3	E-3	E-3	E-3	E-3
Roof garden	E	E	E	O	E-9
Safety deposit boxes	E	E	E	E	E
Garage	E	E	X	E	E
Valet department	E-11	E-11	E-11	E-11	E-11
Soda fountain	X	X	E-12	E-12	E-12
Quick service dining rooms	X	X	E	E	E
Ground floor stores	X	X	E	O	E
Professional offices	E	E	E	O	E
VIII. General Features					
Provision for pets	E	E	O	E	E
Parking space	E	E	X	E	E
Room service facilities	E	E	O-5	X	E-13
Provision for signs	X	X	X	X	E
Porte cochere	E	E	E	E	E
IX. Electrical Features					
Numerous electrical outlets	E	E	E	E	E
Radio outlets	E	E	E	E	E
Floodlights	O	O	O	O	E
Outlets for violet-ray machines	E	E	E	O	O
Shaving lights	E	E	E	E	E
Closet lights	E	E	E	E	E
Automatic refrigeration	E	E	E	E	E
Auxiliary lighting	E	E	E	E	E
Signal system (maids')	E	E	E	E	E

REFERENCE

1. Excellent for winter resorts.
2. Excellent for resorts that cater to family trade and for commercial hotels that also cater to residents.
3. Expense is seldom justified in a hotel of less than 500 rooms.
4. Almost essential to have space for this purpose in a hotel of over 500 rooms in size.
5. Excellent for clubs, such as the Union League, etc.
6. Very good for suites, sample rooms and parlors.
7. Sometimes profitable in hotels of under 100 rooms in size. Generally profitable in larger houses. In hotels of over 500 rooms, it usually pays to do guest work.
8. Depending on location. Hotels of 500 rooms or over can support a barber shop from guest patronage. In a 1,000-room house there are enough women patrons to make a beauty shop profitable.
9. Seldom profitable for catering facilities unless house is located in a large city.
10. Only for large hotels or smaller houses with a great deal of family business.
11. In hotels of under 200 rooms in size when handled in connection with the linen room. As a separate department when in hotels of over 200 rooms in size.
12. Only in hotels of over 200 rooms in size unless a street location is possible and the traffic heavy.
13. For hotels of over 200 rooms in size.
14. An excellent feature in large cities where many commuters stay downtown for dinners, theater, etc.
15. Provide for pay locks, disinfecting equipment, soap dispensers, shoe shine department, lavatories, mirrors, first class ventilation.
16. Special drawers and containers for men's and women's clothing.
17. Growing demand for these in metropolitan transient hotels.
18. Built-in features prevent breakage due to guests' carelessness in putting up own hangers.
19. If water tests show need for it.

MODERNIZING EXISTING HOTELS

BY

C. STANLEY TAYLOR

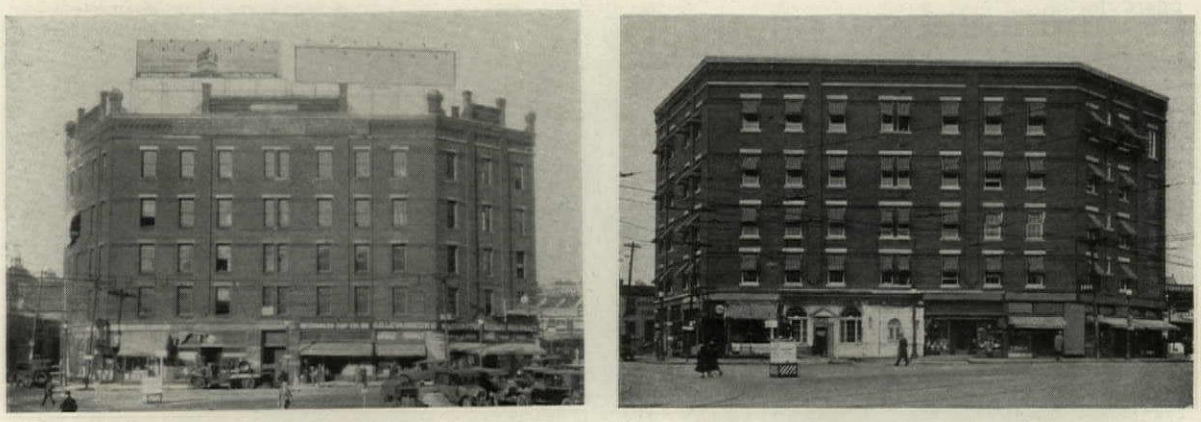
THERE has always been competition between new and old hotels, but until less than a decade ago, this competition seemed to take care of itself, while the attention of the hotel world was centered on a tremendous expansion of hotel facilities that has resulted in the overproduction of room space in many centers. It is hardly necessary to look into the causes which fostered the active promotion of hotels; undoubtedly the development of community-financed hotels has been a potent factor, but it does not stand alone as the only cause of recent hotel construction activity. Today the situation has so far developed that owners and managers of existing hotels must very seriously consider methods of meeting the competition of modern commercial and residential hotels in order to keep red ink figures from their balance sheets.

Fortunately, the modernization of existing hotels is frequently both practical and profitable. It is a type of work in which architectural counsel is just as important as in the creation of new residential structures. This field of hotel design offers a potentially enormous practice for those architects who are prepared to study the problems involved and to apply all of the ingenuity and skill at their command to achieve successful results with structures that have fallen behind the times.

Economics of Modernization. The owner of an existing hotel that is 10, 15, or even 50 years old has almost as many advantages as handicaps in competition for profitable business. When a new hotel is constructed, the site usually costs the owner the full prevailing market price for high grade centrally located realty. In the larger cities, hotel sites command prices which are almost the equal of those paid for the development of the most important commercial buildings. In smaller communities, where hotels are usually situated within a block or two of the center and yet outside of the center of maximum realty values, the purchase of a site does not often represent such a large part of the total investment, although it must always be considered an important factor. The owner of an existing hotel frequently possesses a site that cost him far less than its present worth,—and that is naturally far less than the investment which a new competing hotel would have to make for a plot of equal desirability.

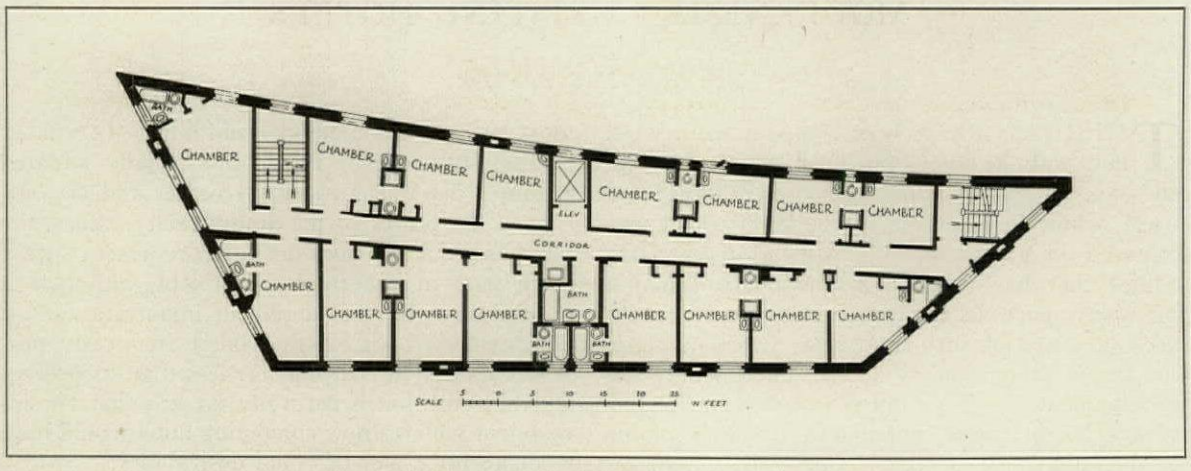
The construction of a new hotel also involves paying present-day prices for labor and materials which would be approximately double the prices paid for pre-war construction. Furthermore, the existing hotel has been writing off part of its valuation through reserves for depreciation and obsolescence. Thus when the old hotel starts out to compete again with its newer neighbors, it has the advantage of representing a far smaller capital investment upon which it must return dividends. The amount of remodeling and modernization work that must be undertaken to restore the old hotel to popular favor varies, of course, with the condition of the structure and the nature of the competition which it must meet. Nevertheless, it is usually possible to avoid expensive structural changes and to make extensive use of existing features so that the new investment required to catch up with the times is less than the investment necessary in a new hotel to provide the same facilities.

It should be remembered, too, that the old hotel does not need to command the same class of trade as a costly new structure, nor does it have to charge the same scale of prices in order to make a satisfactory profit. The investment is less; the



A Commercial Building Modernized into a Hotel at Worcester, Mass.

Leland Hubbell Lyon, Architect

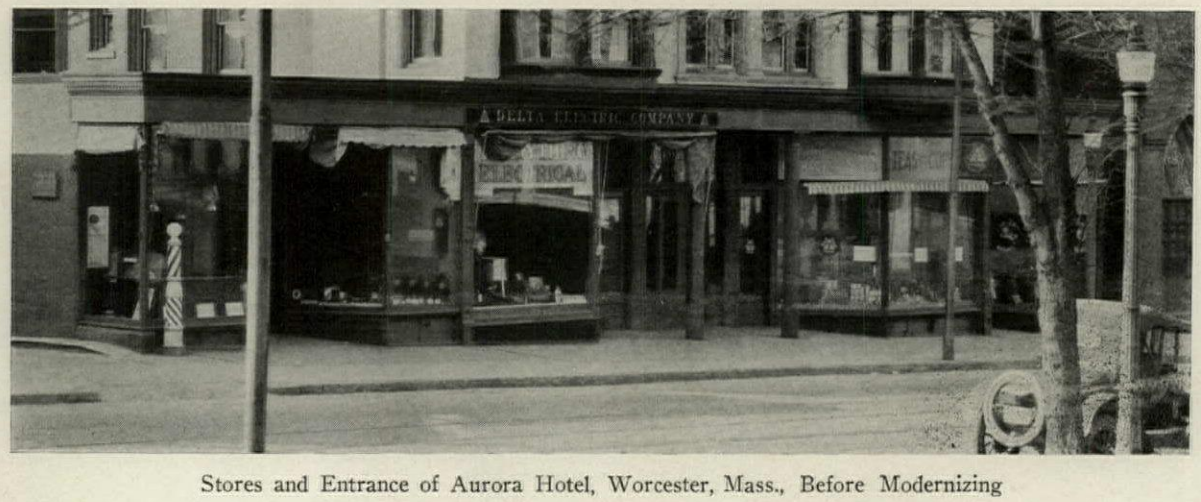


Plan of Worcester Hotel Shown on Preceding Page
Leland Hubbell Lyon, Architect

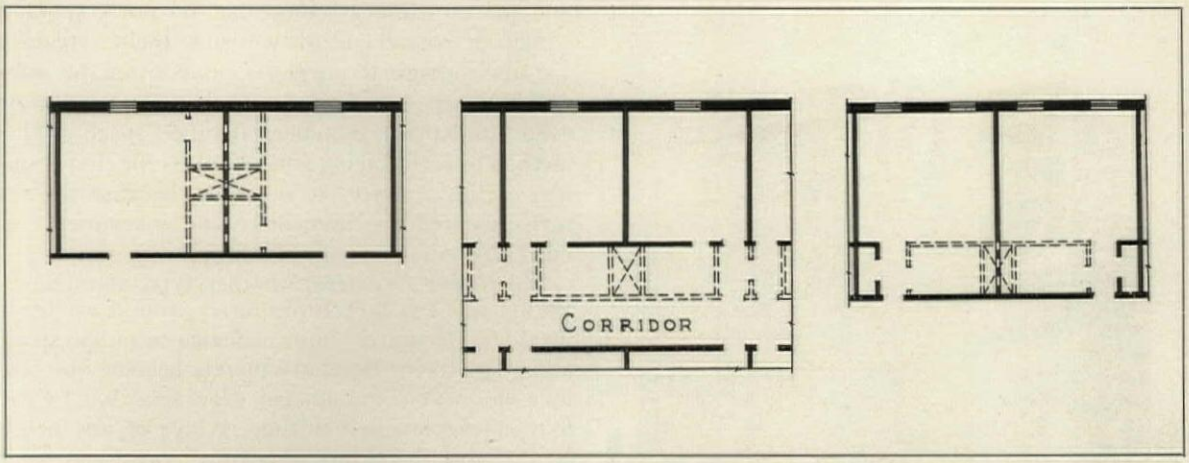
cost of the modernization is less than the cost of new construction; and the cost of financing a remodeling operation is usually very much less than the cost of raising funds for a new building. Operating costs are about the same per room in either a new or a modernized old hotel, but with overhead and fixed charges so very much lower, the gross income from room returns and concessions need not be very high in order to show a profit of satisfactory size.

The financing of remodeling operations is not as difficult as might appear on first thought. Paradoxically, some hotels that are almost hopelessly in debt to mortgagors and creditors can be refinanced more easily than a hotel that is just beginning to show losses. In such cases, the creditors, realizing that a failure of the hotel would return them little or nothing for every dollar owed them, and appreciating that once the hotel were modernized it stood a fair chance of recovering its earning power, are often willing to provide additional capital for a well planned modernizing operation in order to protect the money which is already tied up. If a hotel does not appear so hopelessly set, it nevertheless can present to bankers and often to individual investors such a clear analysis of the increased earning power of the hotel after it has been modernized as to secure the necessary financial support to undertake the changes.

Reasons for Remodeling. Remodeling and modernization should not be left until the hotel has declined to the point where its earning power has vanished. The intelligent hotel manager in recent years has realized the importance of making changes from time to time to keep in step with newer competition. The hotel that has been successful for many years is generally in greater danger of becoming obsolete than one that has had to fight for its existence. There is need for overcoming the inertia of success. The Waldorf-Astoria in New York is perhaps the most famous example, for this old timer retained much of its mid-Victorian character through more than three decades of competition from newer hostelries. To be sure, it constantly renewed its mechanical



Stores and Entrance of Aurora Hotel, Worcester, Mass., Before Modernizing



Plans Showing Three Methods of Providing Baths Under Various Conditions in Old Hotels

equipment, put in modern plumbing and lighting systems and up-to-date elevators, but finally the day came when changing conditions forced its demolition.

Successful hotels of this kind often develop a clientele of regular patrons who year after year reside in the hotel as permanent guests, or come back with such frequent regularity, because of their love for the old place, that the manager finds no need for cultivating new friends. Such a condition is interestingly illustrated by a small hotel of less than 200 rooms at Worcester, Mass. The old Aurora Hotel has enjoyed a patronage of well-to-do people who have lived within its walls, permanently or intermittently, for many years. Recently the manager began to note that some of his old patrons were dying off. The hotel still houses several octogenarians and one who is approaching the century mark. The younger people of the city rarely came to his hotel, because it had acquired a name for sedateness and old fashioned characteristics that offered them no attractions. What would happen when more of his old customers passed away? It was time to plan constructively for building up a new and younger clientele. The result of these thoughts was to engage an architect to completely remodel the lower floors of the building without unnecessarily disturbing the rooms on the upper floors favored by the present clientele. A handsomely decorated lobby, modern dining rooms and food service facilities, a coffee shop and space for profitable concessions were introduced in the ground floor and a modern ballroom where the younger generation could dance, and where local organizations and civic societies could hold meetings in attractive environment was created in the basement. The exterior was but little changed except that the entrance was made more attractive through skillful design. As the upper floors were temporarily vacated, they were completely redecorated and refurnished and the mechanical equipment brought up to date. Through this process of conversion the manager has wisely paved the way for attracting new patronage to replace the old that is literally dying out.

Stores and Entrance of Aurora Hotel, in Process of Modernization

Leland Hubbell Lyon, Architect

Addition to Hotel Not Originally Designed for Additions. Property Acquired Later. Penn Harris Hotel, Harrisburg

W. L. Stoddart, Architect

Types of Modernization Work. While the function of all modernization work is to increase net incomes, the manner in which this may be accomplished varies in almost every operation. It is governed by conditions and by the nature of the competition which the old hotel is facing.

Sub-rentals. So many old time hotels have enormous lobbies and extensive dining rooms, lounges and other public space far beyond the needs of its guests that one of the most common methods of increasing net income is the conversion of non-productive space into income-producing space through the introduction of stores, shops, and various types of concessions. The familiar small town hotel, with its plate glass windows, brass rails and overstuffed leather lounge chairs occupying valuable street frontage, is adopting the modern city hotel practice of putting the lobby into the back part of the building, or on the second floor and using its street frontage for small stores and shops. These old hotels were likely to employ excessively high ceilings for their public rooms. Sometimes there is sufficient room to introduce a complete additional floor by cutting in half horizontally the space formerly devoted to public rooms. Within these lobbies there is frequent opportunity for introducing news and tobacco stands, florist shops, barber and beauty shops, telegraph and telephone offices, and even brokerage and real estate office space with a minimum of structural alterations. Ball rooms and private dining rooms that do not command sufficient patronage to warrant their retention for their original purposes, may often be subdivided into guest rooms or sample rooms, or even sub-let for commercial office space. This method of introducing sub-rentals is the first problem of the architect to consider, because the returns secured are immediate and investment required is comparatively small.

Restoring Prestige. Another type of modernization work is largely centered around architectural and decorative improvements to public space and guest rooms that have merely become obsolete in style. New guests are very sensitive to the first impressions which they receive of any hotel. Remodeling the exterior facades, rearranging and redecorating lobbies and public space, and refinishing guest rooms in the style adopted by newer hotels will often give to the old structure an air of progressiveness and quality which are first aids in restoring it to favor and prestige with the traveling as well as the local public.

Modernizing Guest Rooms. Undoubtedly the most important changes, from the guest's point of view, are those which are made in the guest rooms. Modern hotel practice has established some well defined standards of accommodation. A comparison of these standards to the facilities offered in the existing hotel will quickly enable the architect and the hotel manager to discern the nature of the changes which must take place. Guest bathrooms are judged even more critically than are the guest rooms themselves, for perhaps the greatest improvements in hotel accommodations have taken place in these units during the last decade or two. Old fashioned hotel guest rooms are usually much larger than those offered by modern structures. The traveling public does not seem to resent seriously this cramping of temporary living quarters. In consequence, it is not usually a difficult matter to introduce bathrooms where they were lacking before by taking part of the space from each guest room, or by removing some of the partition walls between adjoining rooms and reconstructing three rooms where two existed before, or five rooms in place of four. Typical methods of introducing bathrooms are shown in the accompanying chart.

It is hardly necessary to describe in detail the physical changes to make or to re-create attractive guest rooms out of those so commonly found in old hotels. When changes are undertaken the aim is to secure accommodations which closely resemble the guest rooms found in modern hotels.

Modernizing Mechanical Equipment. One of the chief contrasts between old time hostelries and those of a very recent date is found in the character of the mechanical equipment, such as elevators, heating systems, lighting, plumbing, re-

frigerated drinking water, and telephone service. The modernization of heating plants opens up a number of very interesting opportunities. Old fashioned hot air systems that are sometimes still found in small tourist and resort hotels or inns, may often be brought up to date by installing new furnaces fired by coal, oil or gas with electric blowers to force air uniformly to all rooms. The addition of humidifying apparatus to this equipment and the introduction of check dampers to control the distribution of air as needed will often put the old heating system into very satisfactory condition,—even making it superior to steam or hot water installations that would be vastly more expensive. Old steam installations sometimes may be transformed to modern vapor vacuum systems, if the hidden distribution lines are sufficiently tight, by the installation of the proper types of valves, vacuum pumps and other elements, without any material change in the boiler or the piping layout. Much can often be done to improve heating service and reduce fuel costs by installing a modern boiler in place of one that is either worn out or of low efficiency. Ugly radiators may be covered with enclosures, or they may be replaced by modern types.

Old style elevators reveal their deficiencies very quickly to the sophisticated guest. Their replacement with modern equipment in the same shafts is frequently possible if the structure of the buildings will carry the load of modern elevators and if the shafts are in such condition that new guides and new doors may be installed without extensive alterations. Frequently elevator service may be increased to meet modern standards by such changes in equipment, or by taking a part of the waste space that is frequently found in old hotels devoted to broad staircases, remodeling or relocating the latter to provide for one or two additional elevator shafts.

The modernization of lighting systems can be accomplished at relatively low cost while other changes are taking place, by adding more outlets to switches, and installing convenience plugs and lighting fixtures. If the old system were run in rigid conduit, the necessary increase in capacity merely involves the replacement of light conductors with others of heavier size. New feeder lines may be run through elevator shafts or through vertical lines of closets from which extensions can be made by under-plaster construction.

Modernization of plumbing systems is not so easy of accomplishment, unless new bathrooms are installed in more or less vertical columns, one above the other on each floor. The structural changes necessary to provide additional baths and toilets are sufficiently drastic to permit the introduction of new soil and water lines. The replacement of old pipes feeding existing baths is more difficult, but the recent introduction of flexible copper tubing, especially adapted to remodeling work, will frequently make such changes possible at much lower costs than formerly. The improvement of telephone service and even the introduction of radio outlets in existing hotels is readily accomplished in much the same manner as the extension of lighting outlets.

Building Designed and Constructed for Future Addition. Robert E. Lee Hotel, Winston-Salem, N. C.
W. L. Stoddart, Architect

Modernizing Food Service Facilities. The food service division of a hotel deserves special attention not only because the guests react immediately to inadequate service or unattractive environment, but also because modern food service equipment has developed so far in recent years that its employment will often save labor costs in the preparation and serving of food. Kitchens, pantries, store rooms, refrigerators, dish washing equipment, and even the linen and tableware should be examined with a view to their replacement if necessary. Old fashioned dining rooms may usually be remodeled and redecorated at no great expense to compete successfully with the multitude of tea rooms, restaurants, cafeterias and coffee shops that have sprung up in the neighborhood since the old hotel was built. Store space that has not rented well, or waste basement area can frequently be converted into cafeterias and coffee shops, while excessively large public dining rooms may be reduced in size during the remodeling process, and the area converted to income-producing space.

CHECK LIST OF ITEMS TO BE CONSIDERED IN THE MODERNIZATION OF HOTELS

I. Preliminary Economic Studies

(a) Examine balance sheet and operating statements for last year or more to determine present investment and present return thereon; also examine monthly room occupancies over a period of years.

(b) Make careful survey of entire community to determine character of competition, potential business, proper rental scale after modernization, need for additional guest room space, demand for store concessions, etc.

(c) Consider value of present hotel site with reference to its continued desirability for hotel purposes. Would it be better to sell, or remodel for commercial purposes?

(d) Estimate the approximate investment that can be made in modernization work by comparing present gross income with estimated gross income based on result of preliminary survey. The difference capitalized at from 10 to 15 per cent will indicate the approximate additional investment that will be feasible.

II. Preliminary Architectural Studies

(a) Secure original working drawings, or prepare measured drawings of the present building.

(b) Obtain report of present structural condition of building to determine soundness and load-carrying capacity.

(c) If additions are to be considered, including additional bathrooms, examine into existing water supply, sewerage (or septic tanks) and pipe sizes to determine if they can absorb additional loads.

(d) Examine mechanical equipment to determine condition and feasibility of use as a foundation for improvements.

(e) Study exterior with regard to feasibility of remodeling to improve style or appearance. Also study interior architectural and decorative treatment of public areas and guest rooms.

(f) Prepare preliminary sketch elevations and plans incorporating changes suggested by preliminary economic survey.

III. Development of Preliminary Studies

(a) With the preliminary architectural studies check over the existing building in great detail, paying attention to these points where they are affected by the proposed changes.

  (1) Structural alterations necessary to incorporate changes.

  (2) Changes in mechanical equipment required by modernization program.

  (3) Examine condition of existing walls, floors, woodwork, doors and windows throughout building to determine what replacements will be necessary, or whether redecorating and refinishing will be adequate where no structural alterations are involved.

  (4) Examine lighting fixtures, hardware, electric outlets and other equipment features to determine finally what may be retained and what must be replaced as part of the program.

(b) Revise preliminary plans and elevations as may be required after this survey.

(c) Prepare outline specifications of changes and secure estimate costs of work involved.

IV. Development of Costs Studies

(a) Prepare a theoretical balance sheet for comparison, item by item, with existing balance sheet and operating statement to show: investment upon completion; gross income from rentals and concessions; fixed charges, and operating charges. Determine probable net income from operation as compared to present income or deficit.

(b) If net profits developed in this study prove inadequate, prepare revised architectural studies showing either a greater or lesser operation.

  (1) Consider feasibility of making less drastic changes by eliminating the items that are most expensive and that will increase revenue the least.

  (2) Consider more drastic changes, including additional rooms or the introduction of more sub-rental space without proportionately increasing the development of non-productive area.

(c) When both economic and architectural studies indicate a logical solution of the problem, prepare final studies and financial statement for presentation to bankers.

V. Final Drawings and Specifications

(a) Proceed with preparation of working drawings, specifications and details in the usual manner, except that if the hotel is to be continued in operation while changes are made, the work must be so organized and scheduled as not to interfere with the convenience of guests.

(b) Select finishes and decorations as required to complete modernization program.

HOTEL FRONT OFFICE EQUIPMENT

BY
W. P. DE SAUSSURE, JR.
EQUIPMENT ENGINEER

PROBABLY no hotel has enjoyed a higher prestige for service through many years than the original Waldorf-Astoria, in New York. Since service rendered in the front office was to some extent responsible for the enviable standing of this house, one might naturally assume that application of the principles and system of the original Waldorf office would fully meet any related requirement. What this system was, is no secret. It consisted of the application of one principle,—that of giving personality. After the first ten years at one station, the room clerks and information clerks applied their personalities to giving a superlative service, in the success of which equipment and system were merely incidental. Their task was rendered easier because traffic in mail, telephone, intercourse, and turnover at that time was small compared to the proportions it has reached today.

Unfortunately, under present-day conditions, one year is a long time for a front office clerk to remain at the same station. Before the Waldorf finally closed, the front office was enlarged, changed and rebuilt many times in a never-completed effort to accomplish what could have been done economically only in the office of the architect when the building was planned. This is not unlike the front office history of many hotels, some of them of rather recent construction. The volume of traffic today in the front office of an active transient hotel located in a metropolitan center is greater in variety and number of items than that of any other business conducted in the same space. Personality at its best, however much it has done and is doing, is not equal today to coping with these modern conditions unaided by intelligent planning in which space is made available to meet the requirements of both traffic and an orderly arrangement of adequate equipment.

Functions. A clear mental picture of the functions of the front office, together with an approximate knowledge of the space these functions require in proportion to the size of the hotel, is necessary in order that the architect may include these details in his plans with assurance and success. There are three main functions in the front office, (1) Rooming; (2) Billing and Cashiers; (3) Information and Mail. Each of these functions requires front counter positions for transaction of business with patrons, these counter positions being so arranged that necessary equipment, concealed from the patron behind counter screens, is within sight and easy reach of the clerk. Some operators separate Information and Mail (General Delivery Mail) into two counter stations. Bill Clerks and Cashiers are separate stations, or one clerk assumes the duties of both, keeping and paying accounts ac-

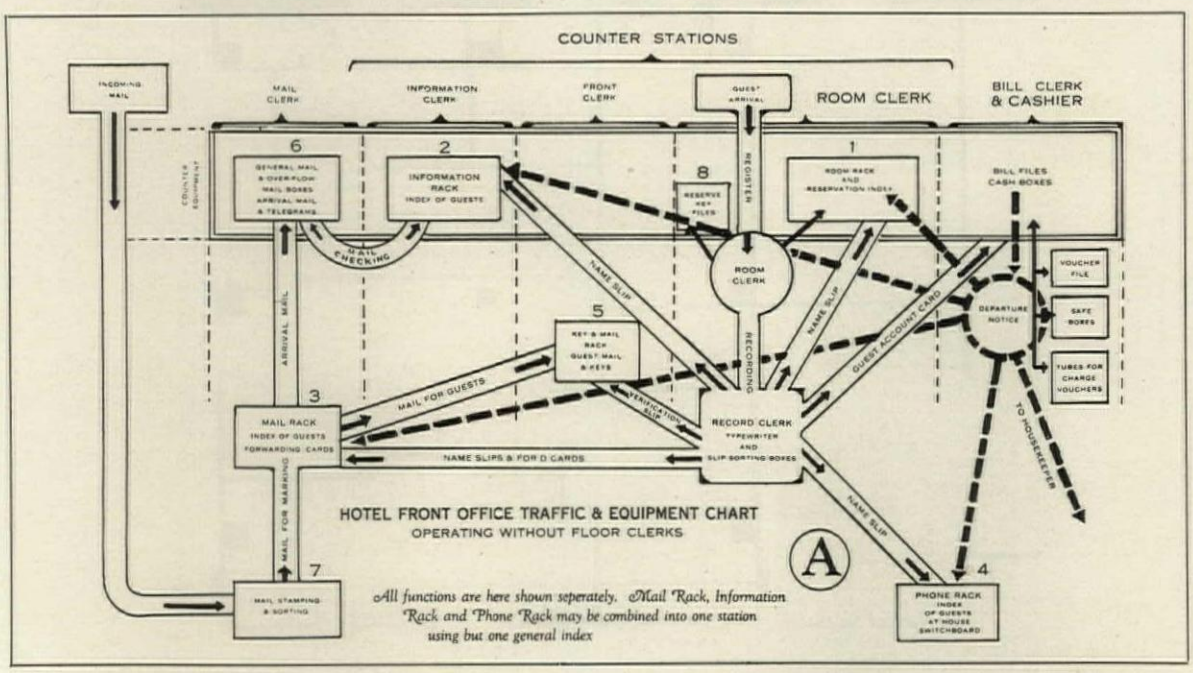


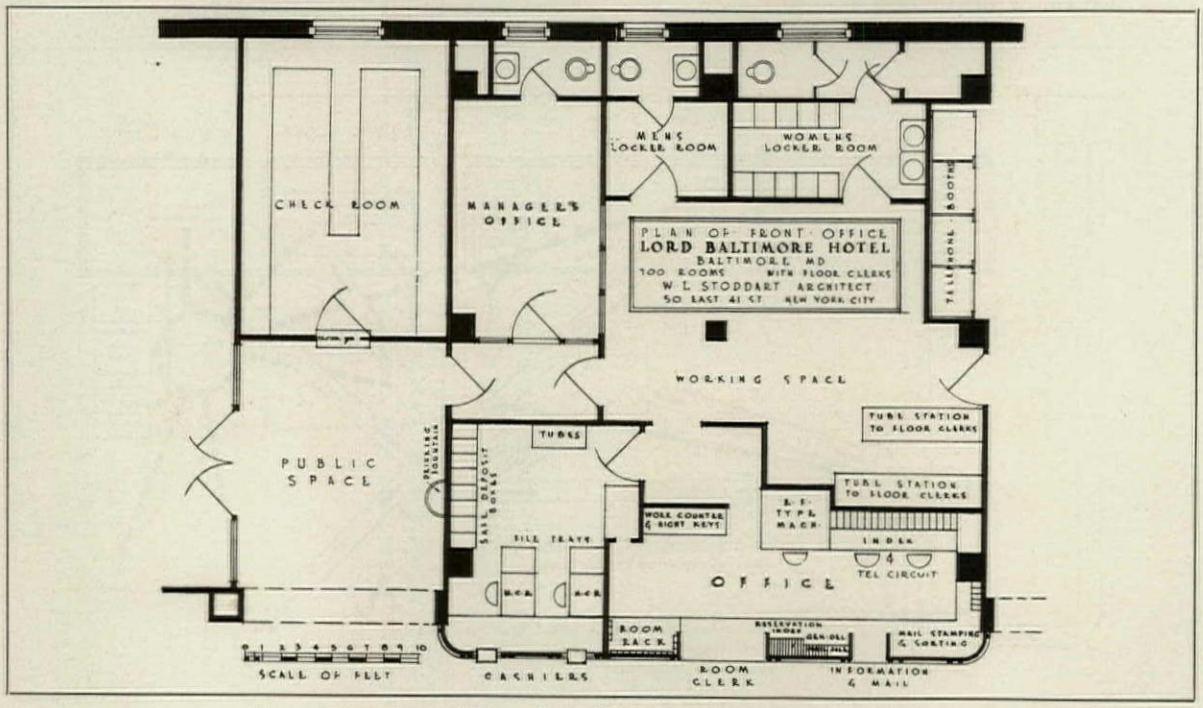
Chart Showing the Relations of Personnel and Equipment to Functions in a Hotel Operating Without Separate Floor Clerks

cording to the operating plans of the management. In neither case is the space required for these functions materially affected.

Counters. A straight front counter 2 feet, 6 inches wide by 3 feet, 4 inches high, without counter stations or counter openings at side counters, which would expose unsightly details of the office to public view, is the preferred type. The Rooming function in the center, with Billing and Cashiers to one side and Information and Mail at the other side is the preferred arrangement. Each Bill Clerk or Cashier requires a minimum of 4 feet, 2 inches of counter with a small window 12 or 15 inches wide in the counter screen. One clerk, or 4 feet, 2 inches of counter space, for each 400 rooms will give the total minimum length of front counter required for this function of the front office. Counter width on the clerk's side of the screen should not be less than 15 inches. On the patron's side of the screen a counter projection of not less than 9 inches is sometimes desirable for convenience of the patron in writing checks.

For Rooming and Information and Mail, the preferred arrangement consists of an open counter of generous proportions with equipment and work space for the several stations behind counter screens. Hotels of up to 300 or 400 rooms would have the room selling board (Room Rack) behind the counter screen adjacent to the Cashier's partition. A screen of balanced proportions to the Room Rack screen is located at the other side of the open counter for the Information and Mail station and equipment. The key and letter rack for guest mail and keys faces the open counter. A counter station for a Front Clerk in the center of the open counter to pass out keys and mail is assumed to exist and is likely to be operated in busy periods. The preferred arrangement of the key and letter rack is one tier of pigeon-holes across the rack for the rooms of each floor of the hotel, or for each two floors when there are more than ten typical bedroom floors. The customary partition centers for these pigeonholes is 2 inches, and this multiplied by the number of rooms on a typical floor gives the length of the key and letter rack and a consequent basis for determining the length of the open counter, which should exceed the length of the rack by 3 or 4 feet. Add to the open counter from 4 to 8 feet for the two counter screens according to the size of the hotel, and we have the total counter length required. Hotels of more than 500 rooms might require an additional 2 feet, 6 inches of counter opening between the Room Rack screen and Cashier, for another Room Clerk, and a similar space at the other end of the counter for a General Delivery Mail Window and station. The width of counter on the Clerk's side of the counter screen should be 2 feet. The open counter facing the key and letter rack should not be of less than 6 feet, even in a very small hotel, and from 8 to 15 feet or more is required in larger hotels in proportion.

It is obvious from consideration of these requirements that having structural columns in the

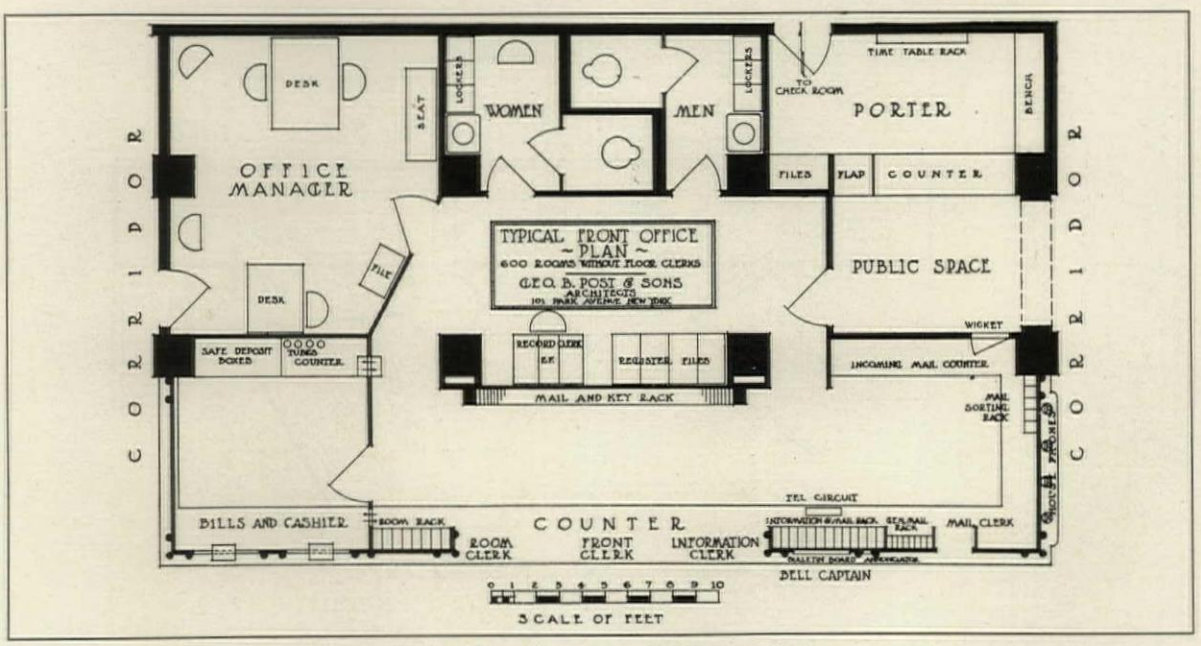


Plan of the Front Office of the Lord Baltimore Hotel, Baltimore
W. L. Stoddart, Architect

front counter line, unless they are happily located and room is available to make up the lost counter space, should be avoided. Safe boxes 2 feet deep are customarily located behind the Bill Clerks or Cashiers. A minimum distance of 6-feet clear is required between the face of the safe boxes and the front counter line. This total clearance of 8 feet from the front counter line to the rear partition can be maintained as a minimum distance throughout the length of the office if necessary. The customary distance from the front counter line to the face of the key and letter rack is 4 feet. In larger hotels a partition is extended on this line to conceal the working details of the back office. Openings in the partition should be without doors, and jogged or so arranged as to avoid presenting unsightly views from the front counter. Having additional length of office beyond the General Delivery Mail window for mail stamping and assorting to be done within reach of the front counter stations is the most economical arrangement of operating conditions for larger hotels. Additional depth of the office in excess of the 8-foot minimum is desirable in larger hotels to provide space for the office manager and for room reservation business.

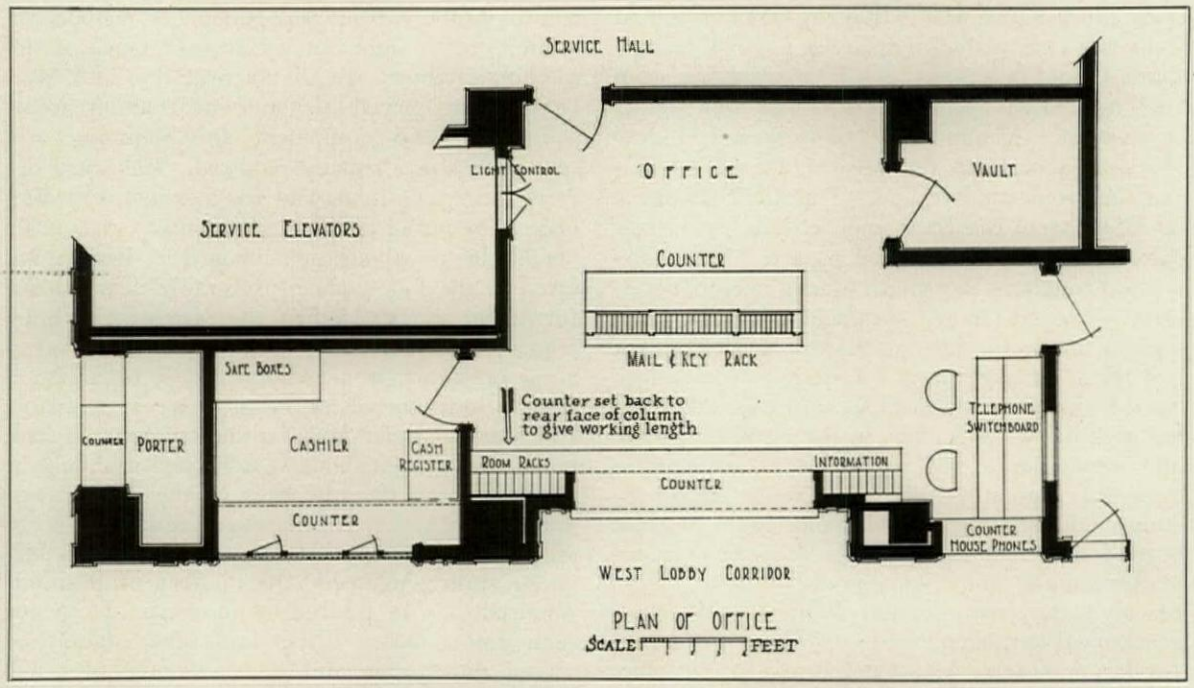
Departments and Equipment. Other stations and equipment are required back of the front counter. In the Cashier's Department this includes pneumatic tubes for receiving restaurant, telephone and other charges, mechanical posting machines or bill files, and space for a voucher clerk with a work counter near the tubes. In the Rooming Department a typewriter and record clerk for typing and distributing registration records to the various departments is customarily located out of sight but within easy reach of the rooming counter. In the Information and Mail Department, special telephone information circuit equipment, and equipment for stamping and sorting mail are usually required. Electrical devices for timing items and for message recording may be required in all departments. In smaller hotels the telephone switchboard is usually located in the front office, preferably near the information index. When the size of the hotel requires a switchboard of more than two operating positions, it is generally best to assign a remote location where more space is available and suitable quiet and ventilation may be had. In placing the telephone switchboard it should be borne in mind that the back of the switchboard must be accessible for maintenance purposes. In the absence of specific information from telephone traffic engineers, the number of positions required may be figured on the basis of one for each 150 rooms. These and other details of screen dimensions and under-counter files will all be readily worked into final shape for a well appointed office if the factors and principles as outlined here are adhered to. The final plan is generally developed through advice from the operator and consultation with equipment specialists who supply the operating equipment. Much of this detail information is available in manuals published by manufacturers.

Floor Clerk Desks. Hotels which use Floor Clerks render key and mail service at the floor offices. The equipment of the Floor Clerk Desk in this case replaces the key and letter rack in



Front Office Plan for a 600-Room Hotel

George B. Post & Sons, Architects



Plan of Front Office, Read House, Chattanooga
Holabird & Roche, Architects

the front office. This eliminates the necessity for having a large open counter in the front office. The front office plan of the Lord Baltimore Hotel, illustrated herewith, may be considered typical of an office for this type of hotel. To fit this plan to a larger hotel of this type, add the required number of Cashiers and the Room Rack screen; increase the lengths of all counter screens, tube stations and index table; and provide one or more additional Information and Mail windows. The Read House front office plan illustrates how the front counter may be set back of columns to gain necessary space for equipment and work counter. Study of the typical front office plans and of the two charts of front office traffic will aid in acquiring the clear mental picture which will make the problem of planning the front office comparatively simple.

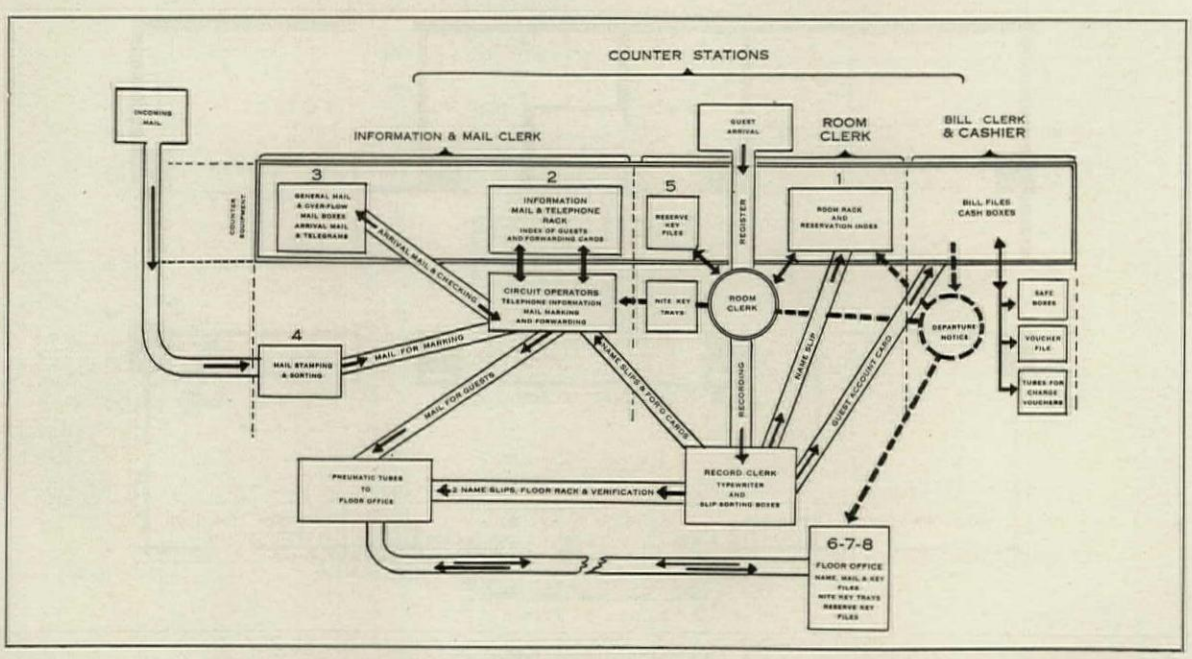


Chart Showing the Relations of Personnel and Equipment to Functions in a Hotel Operating With Floor Clerks

THE REDUCTION OF NOISE IN HOTELS

BY

CLIFFORD M. SWAN

THE first question that may come to the mind is whether noise really presents a serious problem in the modern hotel, except perhaps as far as the unavoidable sound of street traffic is concerned. A little reflection, however, will bring to the recollection of any traveler the loss of sleep he has suffered on account of an all-night poker game in an adjoining bedroom or because of a noisy elevator on the other side of the wall, or perhaps of the indigestion he has acquired through the nervous bolting of a meal in the hurried turmoil of the cafeteria or "coffee shoppe."

One assumes that a hotel is designed to cater to the comfort of its guests, and yet the chief factors in bringing this about,—namely, rest and quiet,—are often left entirely out of consideration. How much of this is due to false economy and how much to thoughtlessness or indifference, it is hard to say. At any rate, after some years of experience and scientific research, many of the difficulties arising from noise can be foreseen and their effects eliminated or minimized by suitable provisions in the design and specifications of the building and its furnishings. Ignorance is therefore no excuse, and the wise architect will devote a considerable measure of thought to such problems. In most cases, the proper provision for noise reduction must be made before or during the erection of the building. When it is completed, there remains little hope of correcting structural sources of trouble.

The Two Problems. There are two classes of problems to be considered. One is the reverberant condition which exists in many rooms and causes a magnification of any sound produced in them. The other is the transmission or conduction of sound from one part of the building to another. The first of these is susceptible of simple and positive solution according to known scientific laws; the second is more difficult, owing in part to complexities of structure and in part to lack of reliable data. Practical experience coupled with common sense is the chief guide in the latter case.

Reverberation, as every architect knows, is a condition existing in every enclosed room, no matter what its size or shape, when the interior surfaces of both the room and its furniture are composed of hard, sound-reflecting material. A sound generated in such a room can be heard for a number of seconds after the source has ceased, owing to the time required to absorb the energy in the course of many hundred reflections. Rapidly succeeding sounds therefore pile up on one another and by such accumulation produce a magnified and jumbled mass of noise. Conversely, if the sound waves can be so rapidly absorbed during a few reflections that their energy disappears in a short interval of time, the magnifying effect does not exist, and the room seems soft and quiet. This desirable condition is brought about by the use of absorbent furnishings or by finishing a suitable proportion of the exposed surfaces with a porous acoustical material.

There are many places in a hotel where reverberation is likely to cause trouble. Dining rooms are subject to considerable confusion from the sound of talking, the clatter of dishes and perhaps the noise of a jazz orchestra. A heavily lined carpet often helps to solve the difficulty, but this is generally restricted to the main dining room and to private dining rooms. Grill rooms and cafeterias with their hard floors should have absorptive treatment on the ceilings. The same applies to kitchens, dish washing rooms, serving rooms and pantries, especially those opening into public rooms or corridors. The acoustics of a large ball room must be adjusted with some care, since such a room is frequently used for concerts, amateur plays, and after-dinner speaking. Its shape, its size, its finish and its furniture all play important parts, and require the same attention as any other auditorium, such as a church or theater.

If there is a swimming pool in the hotel, it should have its entire ceiling treated, not only for the sake of those using it but also to minimize transmission of noise to other parts of the building. Corridors and bedrooms generally have thick carpets which reduce the reverberation which would otherwise exist. In telephone rooms or executive offices where considerable noise is produced, there should be ceiling treatment. The penthouses over elevator shafts should be lined on walls and ceilings with an absorber in order to muffle the sound of the machinery at its source. In general, it may be said that in all rooms where the furniture is scanty or not upholstered and where the floors are of an uncovered reflecting substance such as wood, concrete, terrazzo, marble or tile, the reverberation will be excessive and there should be absorbent treatment of the walls or ceilings or both. The extent of use of this material depends on the height and shape of the rooms, the amount and kind of furnishings, and the severity of the noise condition.

Reflection. Besides reverberation, which is occasioned by the diffuse reflection of sound, it is possible to have a certain amount of specular

Ceiling of Acoustical Plaster in a Large Ball Room

or mirror-like reflection. In such a case, echoes or distinct repetitions are produced. These may arise from parallel plane surfaces, but more often they are caused by a concave curved surface such as the vaulted ceiling of a ball room, grill room, swimming pool or lobby. To avoid such difficulty, the radii of curvature of all portions of such surfaces should always be considerably less than the height of the room or greater than twice the height. A surface with its center of curvature lying between these two extremes is sure to cause trouble.

Noise Transmission. We come now to the second part of our subject, the reduction of noise transmitted through the structure and partitions of the building. First of all, let us be sure that we understand the essential and great difference between this and the problems so far considered. Reverberation and echo are phenomena arising solely from the behavior of the waves of sound within any given room as they are reflected from the inside surfaces of that room, without any relation whatsoever to what happens in any other room separated from the first. Accurate calculation of the amount of reverberation can be made before a room is built, and provision can be made for the exact amount of absorption required to produce correct conditions, with definite assurance as to the results.

When we pass from the phenomena of reflected sound to those of transmitted sound, however, we enter an entirely different and more complicated field, handicapped by having inadequate scientific data and being forced to rely chiefly on practical experience. The methods used in the adjustment of reverberation have little relation to the new problem, except as they diminish the loudness of the originating sound. A new group of phenomena must be studied and a type of correction adopted in dealing with difficulties presented by this division of our subject.

Sound is produced by the mechanical vibration of a material substance within certain limits of frequency or oscillatory period. When such an oscillation takes place, whether it be in a musical instrument or the human larynx or a moving machine, part of the energy is communicated to the surrounding air and radiates in all directions in the form of air waves. The rest of the vibratory motion is transmitted to the supporting structure of the sounding body, whence it may travel as sound waves through contiguous solids.

The air waves travel until they reach an intercepting wall, floor or ceiling, and are partly reflected, partly absorbed and partly transmitted. It is that portion of these waves which is reflected which we have so far considered. We have now to examine the transmitted portion of the air waves, together with those waves that are conducted through the structural support of the sounding body.

Of course, the first thing to do is to diminish the intensity of the sound as far as possible at the source. Footfalls should be deadened by carpets or other resilient floor covering. All machinery should be adjusted mechanically to run as quietly as possible. Fans, generators and other rotating machines must be accurately balanced, noisy gears must be avoided, elevator guides and brake shoes must be quiet. The reduction of reverberation is an aid in reducing the source intensity of unavoidable sounds.

Conduction. Having done all that is possible to diminish the amount of sound created, let us next consider that portion which is communicated by direct conduction. This includes not only the vibration of machinery attached to floors or walls, but also to musical instruments such as a piano or violincello and to all noise of direct impact, such as walking or hammering. Obviously, some form of insulation must be used to prevent these sound waves from gaining access

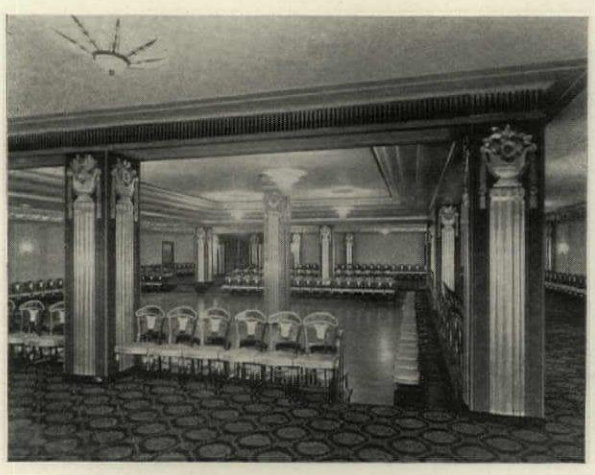
Noise Reduced by Using Sound Absorbing Fiber Board for a Ceiling in the Pantlind Hotel, Grand Rapids

to the structural fabric of the building. The nearer such insulation can be placed to the source, the better.

Machines should be bolted to their foundations through layers of cork or similar material. The foundation, which must be of sufficient weight to provide the proper inertia, should in turn be completely insulated from all direct contact with its surroundings by thick layers of cork or other resilient material. The necessary thickness and density of the insulating material are determined by the load carried. Various spring devices have also been successfully used in some cases to take up the vibrations. As far as is practicable, machinery should be located in the basement or sub-basement to minimize the penetration of sound.

Ventilating ducts should be broken by canvas sleeves near the fan to prevent conduction along the walls of the ducts. Water, brine and steam pipes may require flexible connections at suitable points if proceeding from a noisy source. Soil pipes should be wrapped in sound-insulating material. Pianos should have their castors placed in sound-insulating cups. Resonating platforms required for instruments such as the violincello or double bass should be insulated from the floor. Chairs on a wood floor should have rubber tips on the legs. Employes should wear rubber heels. Necessity for taking these and other elementary precautions ought to be self-evident, but strangely enough they are often forgotten.

Too much emphasis cannot be laid on care in insulation, especially of machinery. Once a sound gets into the building structure, there is no telling how far-reaching and unexpected its effects may be. Concrete and steel are perhaps the best conductors of sound among building materials, owing to their homogeneity and continuity. Brick, on the other hand, is a comparatively poor conductor, especially if there is considerable difference of density between the bricks and the mortar.



The Ceiling of this Room in the Hotel Statler, Boston, is of Acoustical Plaster

Sound Absorbent Fiber Board Ceiling in the Shorecrest Hotel, Milwaukee

Air-borne Sounds. We come now to a consideration of air-borne sounds. These may travel directly through ventilating ducts, through cracks around doors, through corridors or elevator shafts, or even through open windows and thence by reflection from the walls of a light well or nearby building back through other windows. Or they may travel through the air in the room where they are generated until they reach walls, floor and ceiling, where they are partially transmitted into adjoining rooms.

Ventilating ducts are often a source of considerable difficulty. As far as noise from the fans is concerned, relief can be obtained by lining the interior walls of the duct with a suitable sound-absorbing material for a distance not less than four times the diameter of the duct. It is preferable to place this material near the fans and if possible around a bend in the duct. More serious trouble is experienced where there are several openings from one duct into different rooms. This should be given attention in the ventilating design, and nearby openings should be insulated from one another by absorbent duct lining. The worst trouble is generally in bathrooms all opening on one shaft. A bathroom is always very reverberant, owing to its hard enameled finish. This accentuates the sound of voices so that in combination with open ducts it is possible in many hotel bathrooms to hear conversations in a neighboring bathroom as distinctly as if they were in the same room.

A door crack or a keyhole allows a surprising amount of sound to pass. Bedroom doors, and especially those between rooms, should be carefully fitted, rabeted edges preferred, and with a snug threshold. The old-fashioned lock with its large keyhole, still sometimes to be seen in small hotels, should never be used. The modern

double lock used in first class metropolitan hotels should always be specified. Corridors should always be heavily carpeted, not only to reduce the reverberation but also to prevent reflection which would make them act like speaking tubes. Elevator shafts must be as nearly soundproof as is possible.

Soundproof Partitions. Here we reach the most difficult problem of all—the construction of "soundproof" partitions—a field in which angels may well fear to tread. There is no doubt about the necessity of sound-resistant construction, not alone around elevator shafts but between bedrooms and other rooms, and sometimes even between floors. The question is how to provide a reasonably efficient partition which shall at the same time be not too thick nor prohibitive in price. These requirements are not consistent—hence one difficulty. Another obstacle is our limited knowledge from actual experimental data of the exact behavior of various materials and forms of construction when used in all their possible permutations and combinations. The third hurdle is the ease with which even the most carefully planned construction can be entirely ruined and set at naught by a single careless blunder on the part of some mechanic or his helper.

The factors governing the effectiveness of a surface of any given material as a barrier to sound are density, porosity, heterogeneity, thickness, stiffness and degree of damping. To produce a really efficient sound barrier, two or more materials are generally used in combination, with or without air spaces. Taking these facts in conjunction with various possible ways of erecting the materials, we see at once how complicated the problem really is and how much we need extensive unbiased research to reach a real solution.

In a hotel, the insulation of floors does not often have to be considered. Where it is necessary, the best solution seems to lie in a hung ceiling with an unbroken blanket of some good absorbent material in the space between the ceiling and the overlying floor slab. A floated floor is sometimes used above the slab, but in general it does not seem to be as effective, at least for air-borne waves, as the furred ceiling construction. The chief problem in hotels lies in the walls, especially between bedrooms. It is not the purpose of this article to recommend any definite form of construction for such purposes, but rather to indicate some of the lines of approach.

In general, a single wall plastered directly on both faces permits the passage of considerable sound. By alternating layers of widely different density in the construction, a great gain in efficiency can be produced. Thus a double wall, with an air space in which is placed an absorbent blanket, will show fairly good results with proper care in erection. The two walls must be absolutely independent, without any contacts which will serve as conductive channels. Braces between such walls may even act like the sound-post of a violin and accentuate rather than diminish the transmission. The disadvantage of the double wall is, of course, its thickness and cost.

Other types of walls with various combinations of hard and absorbent substances have been tried with varying degrees of success. The danger in such cases lies not so much in the failure of the combined layers to act as a direct barrier to the sound as in the tendency to reduce the thickness and total mass of the wall to such an extent that stiffness is sacrificed. The resultant flexibility causes vibration of the wall as a whole, and by this diaphragm action it allows impinging sound to be communicated to the air on the other side. With walls of large extent, some sort of an interior air space seems to be almost a necessity unless they are very massive and heavy.

Whatever type of construction is adopted, extreme care must be taken to supervise the actual work in order to be sure that the specifications are carried out to the letter. Double wall construction has been known to fail because workmen have dropped mortar and rubbish in the air space, thus making direct contact between the two walls. Electricians are likely to cut a hole entirely through the wall and place outlet boxes back to back in the aperture, so that to all intents and purposes there exists an open window between the rooms. The layout of electrical conduits, steam and water pipes and ventilating ducts must be studied with care that they shall not pierce the soundproofing.

Communicating doors between bedrooms are a serious weakness. An ordinary single paneled wood door is of about as much value as a sheet of paper. The rational solution is to use a double door, as is often done in the better hotels. Such doors should be flush and not paneled and should be as thick and heavy as practicable. There must be no cracks around them. Elevator and dumb-waiter shafts if improperly insulated are a source of great annoyance to guests in adjacent rooms. Particular attention should be given to them.

As has been pointed out, attention and common sense are the fundamental elements most necessary in providing for noise reduction in hotels or other buildings. With due exercise of these qualities, many problems can be foreseen and met, with much consequent saving of time, annoyance and expense. There is, to be sure, much yet to be learned about the behavior of sound in building structures, but sufficient is already known to make it possible to avert some of the dire results which are often encountered.

MODERN KITCHEN EQUIPMENT CONSTRUCTION

BY
VINCENT R. BLISS
TAYLOR, ROGERS & BLISS, CONSULTANTS

IF one were to compare 25 hotel kitchens as they were equipped 15 years ago with an equal number of the last few years' installations, it would be forcibly brought to light that the present-day standard of construction and materials is far superior. In part this is the result of the better structural methods used by the manufacturers, but to a greater degree it reflects a change in the attitude of hotel operators and their architects.

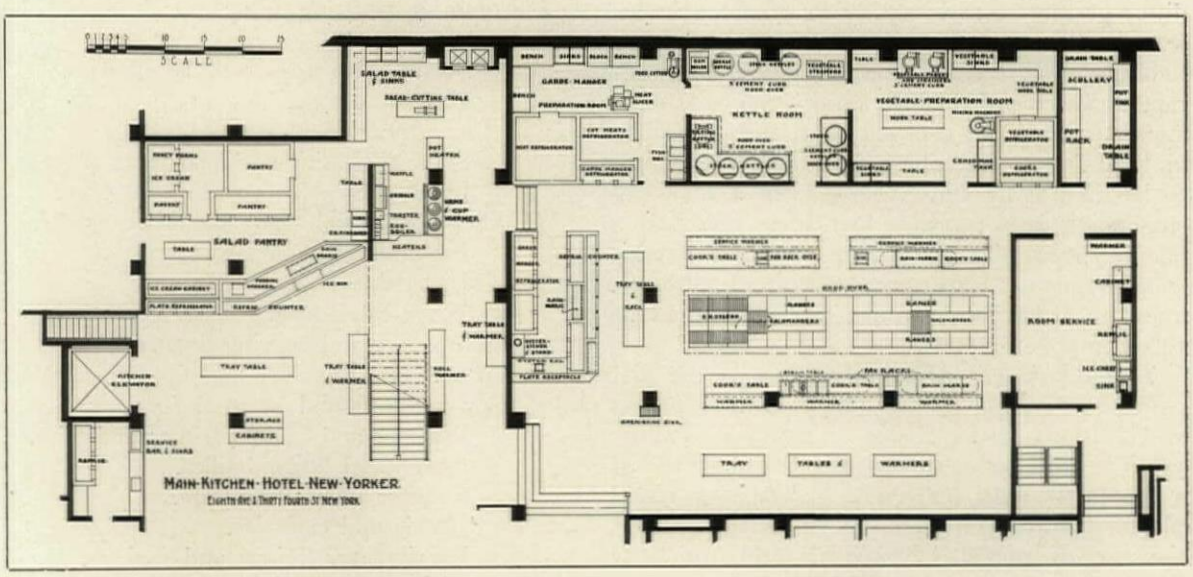
It has taken time to accomplish it, but hotel and restaurant men now seem to be thoroughly alive to the soundness of investing in equipment with an eye to more than initial price. With the liberal profits of the bar business no longer here to fall back upon, food service operation has come in for intensified business study, and the improved conception of the value of culinary apparatus is a natural result. More than this, standards of cleanliness and sanitation have entirely changed. It used to be common to hear some sophisticated person remark: "If you could see the kitchen that food came from, you wouldn't want to eat it." This sort of indictment is no longer justified. The newer types of equipment are just as far advanced in cleanliness and appearance as they are in durability.

Architects no doubt will claim a share of the credit for this improvement, and there is evidence to support this contention. The interest they display in the food service facilities of buildings of all types is noticeably more active, and their cooperation with the kitchen engineers is infinitely more understanding than was the case even ten years ago. While recognizing this improvement, however, it is well to be equally frank about the other side of the picture. These considerations, therefore, are recommended for serious thought:

1. Few architects or hotel operators have more than a superficial understanding of kitchen equipment construction.
2. There is a general lack of knowledge as to what features of construction are really essential to economy and practicality.
3. Much of the equipment that is now being used is distinctly behind the times and should be improved upon.
4. There is far too much specially designed and made-to-order equipment used in most kitchens.
5. A definite need exists for more standardization in equipment design.

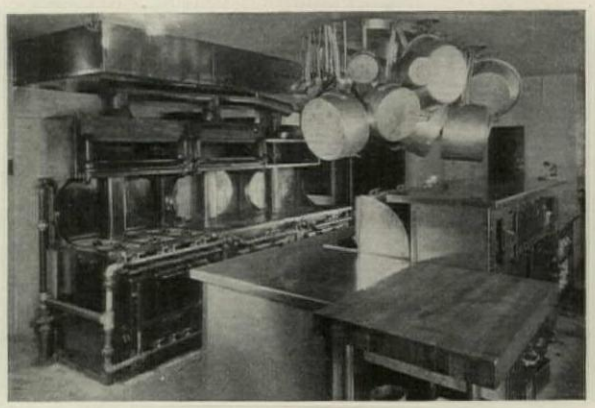
Furthermore, so long as quality of equipment is imperfectly understood, the judgment used in the forming of specifications and awarding contracts is quite likely to be at fault. The obvious corrective is the intelligent use of the architect's power to guide and define specifications, but this can be made effective only through a study of equipment construction and a clear insight into the conditions of the industry.

Determining Quality. In deciding upon the



Plan of Main Kitchen, Hotel New Yorker, New York
Sugarman & Berger, Architects

general quality of equipment to be specified for a kitchen, individual conditions are the first to be considered. For a restaurant operating in rented space, the length of the lease and the likelihood of its being renewed will be factors, for there is undoubtedly a definite relation between the length of occupancy and the rate of depreciation which should properly be charged against the equipment investment. For hotel structures, however, this is rarely a point of issue, for regardless of changes in ownership, it will logically be expected that a hotel building will be used for its original purpose for an indefinite number of years. Selection of quality for hotel equipment, therefore, should resolve itself into determining the materials and construction which will show the most favorable record with regard to depreciation, obsolescence, maintenance and operating costs over a long term of years.



Main Kitchen, Fountain Square Hotel, Cincinnati

Main Kitchen, New Jefferson Hotel, St. Louis

That the various grades of kitchen equipment differ greatly in their ability to stand up under service will not be questioned. It is interesting to observe in this connection that the generally accepted rate of charging off depreciation on kitchen apparatus is 10 per cent per year, and that while no doubt it was the object in naming this figure to be thoroughly conservative from a financing standpoint, it is probable that a ten-year life is not far from the performance actually experienced by many. Experienced operators, however, know that this ten-year life can and should be vastly improved upon.

The Choice of Materials. One of the first points to come up for consideration in preparing specifications is the choice of materials. Many years ago the better class equipment made use of a blue-black steel body with polished or nickel plated steel trim, and polished steel tops. Later, the use of porcelain-enameled steel for body panels became quite popular, but of recent years there has been a very strong trend in the direction of corrosion-resisting alloy metals. This type of metal has proved itself ideal for kitchen equipment purposes, for it not only has ample strength and durability but is practically unaffected by any corrosion, has no contaminating effect upon food, and retains its fine silvery appearance indefinitely, while lowering maintenance and cleaning costs. Its use in the manufacture of equipment is constantly widening, and in many of the recently built kitchens it is specified almost to the exclusion of other metals. The cost of alloy metal equipment is higher than that of any other type, but that it is economical has been proved.

There are, of course, hotels whose finances will not permit exclusive alloy metal construction, but even in the least expensive installations there are certain places where the use of any other material is extremely short-sighted. Just where to draw the line in this respect is often puzzling, but this might be taken as a fairly practical rule:

1. Corrosion-resisting alloy metal should be used for:
   - Steam table tops and accessories.
   - Urn stand tops.
   - Cafeteria counter tops.
   - Soda fountain workboards.
   - Ice cream cabinets and cooler tops.
2. Wherever possible alloy should be used for:
   - Pot and vegetable sinks.
   - Dish table tops.
   - Work table tops.
   - Warmer and serving fixture tops.
3. For ultimate economy and fine appearance, alloy metal should be used for:
   - Warmer and cabinet bodies and trim.
   - Range and boiler bodies.
   - Counter bodies and trim.
   - Hoods and canopies.
   - Refrigerator linings and facings.
   - Dishwasher bodies.

(*Continued on page* 748)

A COMPARISON OF EQUIPMENT CONSTRUCTION

These two diagrams have been made to show how greatly two pieces of kitchen equipment may differ in construction and quality while still being so nearly alike in appearance that they might easily be confused with each other. The examples shown here are identical in dimensions, general design and arrangement—yet an analysis of their construction reveals 15 important points on which Fig. 2 is definitely inferior to Fig. 1. These structural differences alone (without taking into consideration the probability of poorer workmanship and finish) are enough to cause a 25 per cent lower cost for Fig. 2, but this saving is more than offset by the shorter life and greater expense of upkeep that will be the result of its inferior construction. While this comparison was intentionally made somewhat extreme for purposes of demonstration, it is not unusual to encounter equally serious differences in actual competition, especially when the additional elements of workmanship and changes in design are taken into account. A study of these diagrams point by point will be of practical help in forming specifications. The word "metal" indicates non-corrosive alloy metal in these descriptions.

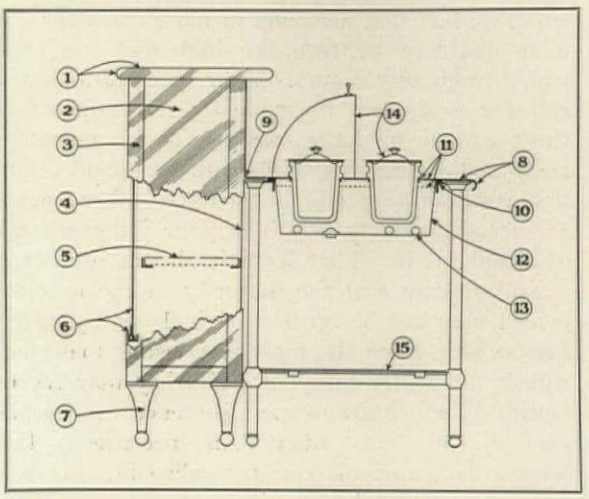


Fig. 1

Cook's Table, Steam Table and Warmer, High Grade Construction

1. Warmer top is No. 12 gauge metal with rolled edges, and welded corners rounded and finished smooth.
2. Warmer body panels are solid No. 20 gauge metal.
3. Angle corners and trim of warmer are of solid metal.
4. Rear side of warmer body of No. 20 gauge solid metal.
5. Shelves are No. 18 gauge metal, edges turned down on all four sides, edges neatly hemmed back to prevent sharpness, corners welded. Shelves perforated and removable in sections and rest upon angle frames riveted to body of warmer.
6. Warmer doors are of solid No. 18 gauge metal, with one-piece welded No. 12 gauge solid metal frames. Door handles chromium plated, roller bearings.
7. Warmer has cast white porcelain sanitary legs.
8. Cook's table top is No. 12 gauge metal with rolled edges and corners welded, rounded and smoothed.
9. Rear edge of cook's table top is turned up and extends up to underside of serving top of warmer, with 2-in. solid metal band trim.
10. Opening for steam table is reinforced underneath with No. 10 gauge 1½ in. metal angles on which the steam table rests so that top of steam table is perfectly flush with top of cook's table.
11. Steam table top of solid No. 14 gauge metal, braced beneath by metal "V" struts, insuring absolute rigidity. Openings in top have reinforced edges.
12. Water pan made of 30-oz. cold rolled copper tinned inside, securely seamed and soldered at all joints.
13. Brass steam coils.
14. Jar covers, meat pans and meat pan covers all made of metal; vitrified china jars.
15. Removable slatted band iron shelf, galvanized.

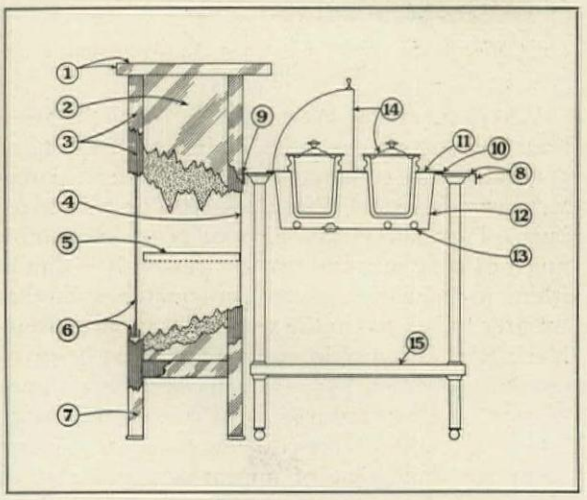
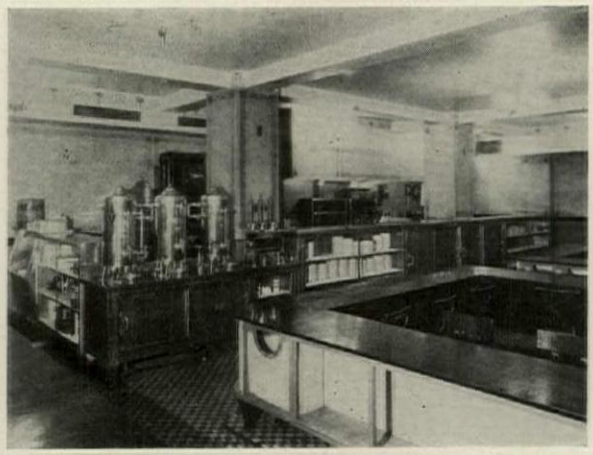


Fig. 2

Cook's Table, Steam Table and Warmer, Inferior Construction

1. Top is No. 14 metal with square edges and corners welded but not carefully finished.
2. Warmer body panels are thin (No. 25 gauge) metal over galvanized iron.
3. Angle corners and trim are of steel, wrapped (veneered) with thin gauge metal.
4. Rear side of warmer is of galvanized iron.
5. Shelves are No. 20 gauge galvanized iron, riveted to the warmer body. These shelves are not perforated, not removable, do not have welded corners and are unsupported by any angle framework.
6. Warmer doors are of No. 25 gauge metal over galvanized iron with wrought steel frames wrapped with thin gauge metal. Doors have nickel plated handles, and operate without roller bearings.
7. Angle corners of warmer body are extended to floor,
8. Top is No. 14 gauge metal with square edges and corners welded but not finished smooth.
9. Rear edge of cook's table is turned down, leaving the galvanized iron warmer back entirely exposed.
10. Opening for steam table is not reinforced; steam table is mounted on cook's table top, and therefore the two tops do not provide a flush surface.
11. Steam table top is made of No. 22 gauge metal stretched over galvanized iron. Bracing beneath top and reinforcement around openings are omitted.
12. Water pan made of 24-oz. copper, tinned inside but less carefully constructed.
13. Galvanized iron steam coils.
14. Nickel plated copper meat pan and jar covers and enamelware meat pan; stoneware jars.
15. Galvanized sheet steel shelf.

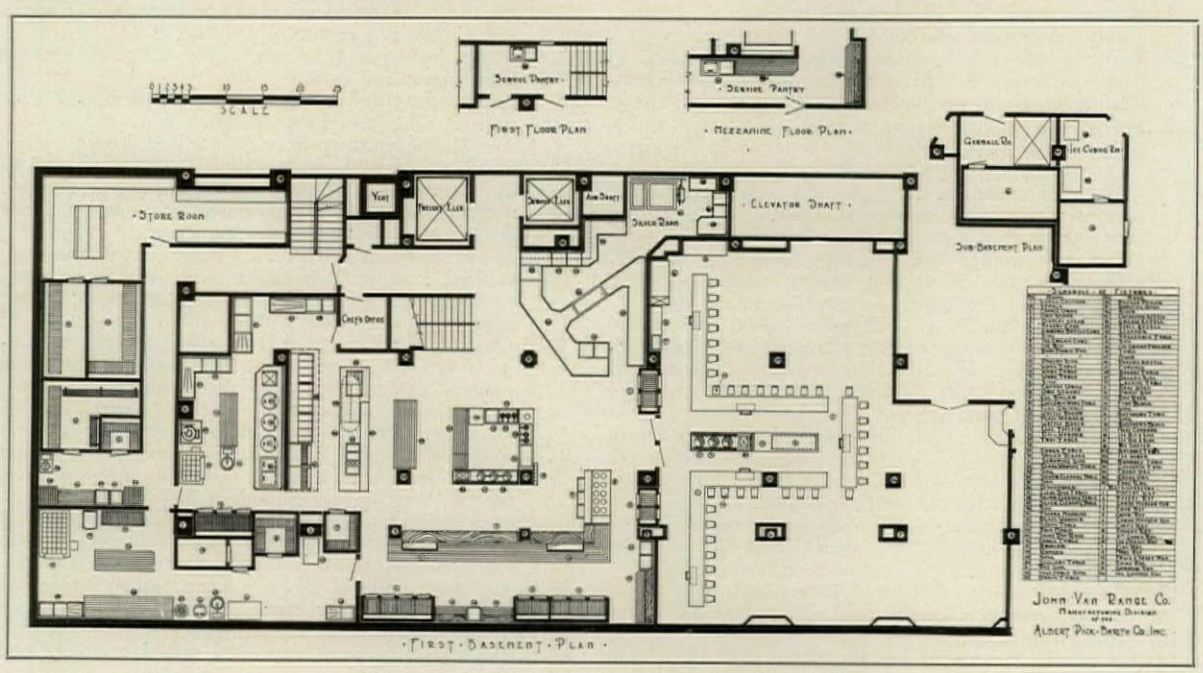


Coffee Shop Serving Kitchen, Lord Baltimore Hotel, Baltimore

Where the use of alloy metal is out of the question because of cost, the body construction of general service equipment may make use of porcelain-enameled steel, blue-black steel or galvanized iron. Porcelain-enameled steel does not offer much of a saving, and for this reason it is diminishing in popularity, except for counters and other fixtures to be used in the restaurant proper. Blue-black steel is lower in cost, but it must be given constant attention to prevent its becoming ruined by rust. Galvanized iron is, of course, the cheapest of all, and is likewise the least satisfactory from the standpoint of appearance and ease of cleaning,—disadvantages which are somewhat offset by keeping the equipment painted.

Differences in Methods of Construction. Settling upon the general design and materials to be used in the kitchen equipment unfortunately does not dispose of the question of quality, for the method of construction is equally important. Grades of quality are very loosely defined. No two manufacturers use exactly the same methods of construction, and indeed some concerns have two or more qualities upon which they will figure according to circumstances.

Without going into a multitude of details, it is a little difficult to give a clear idea of the structural variation that is possible on equipment of almost identical outward appearance. Individually, these differences may often seem small, but in the aggregate, they mean a great deal,—and it is this fact that accounts in most cases for the wide disparity between the high and low bids which frequently occurs. Your specifications will call for equipment as made by some manufacturer whom you have selected for his responsibility and engineering skill, with the qualification that consideration will be given to other manufacturers' products, which in your judgment are of equal merit. That is as it should be, but it is still a truth that the majority of the bids received may not be on the original quality specified at all. Even the most responsible manufacturers, no matter how sincerely they may try to conform, will show some difference on 90 per cent of the items other than specialties. But among the group of concerns called in, it is safe to say that there always will be at least one which will attempt to secure the business on the basis of low price alone, and which, in order to do so, will interpret the specifications just as much in



Plan of Main Kitchen, Lennox Hotel, St. Louis
Preston J. Bradshaw, Architect

favor of cheapened construction as it feels is safe. There is only one way to guard against this. The original specifications must be thorough, explicit and complete, and the discretion used under the "or equal" clause must be based upon an investigation of each firm's methods of construction, rather than on a general impression as to its responsibility.

A concrete illustration will help to make this more understandable. Let us take for an example a combination of cook's table, steam table and service plate warmer,—an item of equipment which is included in every hotel kitchen. Assume now that you have decided on what might be termed complete alloy metal construction, and that your specification reads in this way:

Cook's Table With Steam Table and Service Plate Warmer

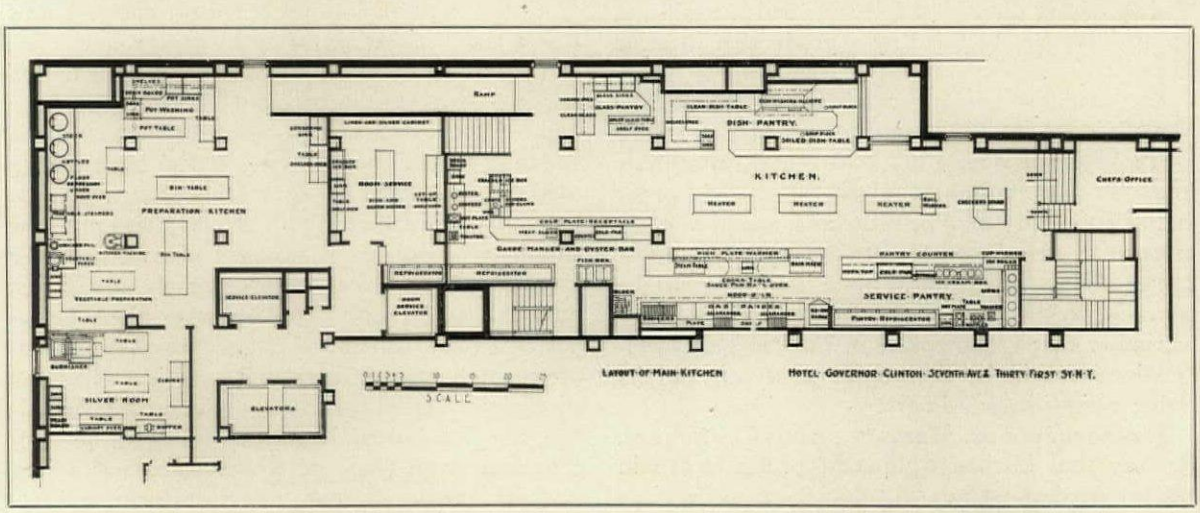
"Cook's Table top to be 10′ long, 30″ wide, and 34″ high, constructed of heavy gauge Monel metal, with edges turned down 1½″ and corners welded. Table top is to be supported on iron pipe stand, furnished with galvanized iron shelf 10″ above the floor. The top of Cook's Table is to have opening to accommodate Steam Table specified hereafter.

"Steam Table is to be 52″ long, 22″ wide, and is to have a heavily constructed Monel metal top, with openings for three meat pans and two gravy jars. Water pan is to be of heavy cold rolled copper tinned on the inside and 7″ deep. Steam Table to have waste and water filling connections and to be arranged for steam heat.

"Service Plate Warmer is to be 10′ long, 15″ deep and 48″ high. The top of Warmer to be 20″ wide, extending over front and ends 1½″, the rear extending over top of Cook's Table, and is to be of heavy gauge Monel metal with edges turned down 1½″ and corners welded. The body of Warmer is also to be of Monel metal mounted on 8″ legs and is to have four horizontal sliding doors across the front. Warmer is to have three shelves, counting the bottom as one, and is to be arranged for steam heat."

Cafeteria, Lord Baltimore Hotel, Baltimore
W. L. Stoddart, Architect

Under these circumstances it is entirely conservative to say that from 10 to 20 important features of quality are subject to variation at the option of the manufacturer. On another page there are shown comparative diagrams of two fixtures of this type, and a brief study of the data will make it quite evident that neither superficial appearance nor a general specification is sufficient to determine the true quality. The two pieces of equipment shown in the diagrams look so nearly alike that they might easily be confused, and either of them would fit the specification given here. Yet in the details of their construction they are so far apart that to compare their prices on an equal basis would be absolutely unfair. Without taking into consideration the



Main Kitchen, Hotel Governor Clinton, New York
Mergatroyd & Ogden, Architects

slighted workmanship which might accompany cheapened construction, the poorer fixture would probably cost 25 per cent less to manufacture, and yet its value per dollar to the purchaser would be far less than that of the better product.

The occurrence of any such disparity in quality between competing bidders will be largely blocked by the adoption of a more comprehensive and definite specification than that just quoted; the better specification would read, in part:

Cook's Table With Steam Table and Service Plate Warmer

"Cook's Table top to be 10′ long, 30″ wide, and 34″ high, constructed of heavy No. 12 gauge Monel metal, No. 3 grind, satin finish and to have a neat rolled rim 1½″ on working side and both ends with corners welded solid and finished smooth. At the rear, the table top is to be turned up against the back of Service Plate Warmer and to extend up to the underside of serving top of Warmer and trimmed with 2″ No. 12 gauge band Monel, No. 3 grind finish. Table top is to be supported on 1¼″ iron pipe stand, flanged at top with malleable rail fittings and cross rails all around, and furnished with ball feet. Resting on cross rails of stand there is to be a slatted band iron shelf, galvanized after made. Bands to be spot-welded to galvanized angle cross braces. Ends of bands neatly curved to fit around cross rails of stand, to be made in suitable removable sections. The top of Cook's Table is to have opening to accommodate Steam Table specified hereafter, opening to be reinforced underneath with 1½″ No. 10 gauge Monel angle, angle edge protruding ¾″ inside of opening on which the Steam Table top will rest, so that the top of Steam Table will be perfectly flush with top of Cook's Table."

As can be seen, this specification calls definitely for the better quality of fixtures, and it could not in any fairness be filled by a product of inferior construction.

But even the best of specifications cannot take the place of intelligent analysis, and the nature of the equipment used in kitchens and restaurants requires that constant vigilance be used in order both that quality may be protected, and that manufacturers may be enabled to bid under the most advantageous conditions. Some latitude must be allowed, but this must be under tight rein. Every variation that is permitted in the original specifications should be thoroughly analyzed and its value weighed accordingly.

Standardized vs. Made-to-order-Equipment. To say that kitchen equipment products are in urgent need of standardization, both as to sizes and designs, sounds like a vague generality. That this is a practical and not academic problem will quickly be seen when it is said that to manufacture a single fixture,—a steam table, for instance,—costs from 10 per cent to 20 per cent more than would be the case if the product were made in lots of from six to a dozen,—and yet this does not begin to tell the story, for manufacturing products a dozen at a time in no way approaches "quantity production." What is needed is a condition which will permit the building of 100 or more fixtures on a continuous production schedule, and when this happens it will not only bring about a drastic reduction of costs but in all probability a further improvement in quality.

Without the active help of architects and restaurant operators, little can be done. Architects can discuss the problem thoroughly with the kitchen specialists who are coöperating with them and encourage the use of standardized designs and sizes wherever possible. Any kitchen outfitter who does not respond to this invitation with enthusiasm may be charged as seriously lacking in progressiveness.

Developments in Refrigerators. A commentary upon the subject of kitchen apparatus would be incomplete without mention of refrigerators and cold service fixtures. Here, too, a general raising of standards is to be observed. One interesting new development is the improved use of individual self-contained refrigerating units for single fixtures in isolated locations.

On the whole, it is agreed that our mechanical refrigerating machinery is very efficient, and that, barring some unexpected new discovery, further improvement will be in the nature of refinement. In view of this the most hopeful opportunity for bettering performance seems to lie in planning the refrigerator itself. Taking the heat out of the refrigerator is only half of the problem; it is just as important to prevent heat entry. Thus refrigerator insulation becomes a very live topic, and as we study it we are finding that many of our old ideas are incorrect. Through the findings of the United States Bureau of Standards and other scientific agencies, it has been shown that the last word about refrigerator insulation has not yet been written, and that there are new substances available which will materially better present performance. For example, one such material, composed of a vegetable fiber, is reported by the Bureau of Standards as being approximately 25 per cent more efficient than the average insulation used today. Non-corrosive alloys are being used largely in refrigeration box construction in place of wood. The result is a stronger, more efficient, more uniform and attractive product.

REQUIREMENTS OF HOTEL GARAGE DESIGN

BY

ROGER B. WHITMAN

THE providing of accommodations for automobiles has long been part of the service of a hotel to its guests, but only of late years has it been recognized as an important factor in the business of hotel keeping. With the increase of automobile touring and the use of cars for business travel, garage conditions are now known to have a direct bearing on the success of a hotel, and for this reason they should be taken into consideration from the inception of any hotel project. Dependent on his car for transportation and desirous of making the most of the daylight hours, the traveler is attracted to the hotel that, other things being equal, allows him to go from his car to his room with the least exertion and permits his departure at the shortest notice. From this point of view the maintenance of a garage is justifiable even when it does not show a consistent profit, for a deficit may reasonably be charged to service and to promotion.

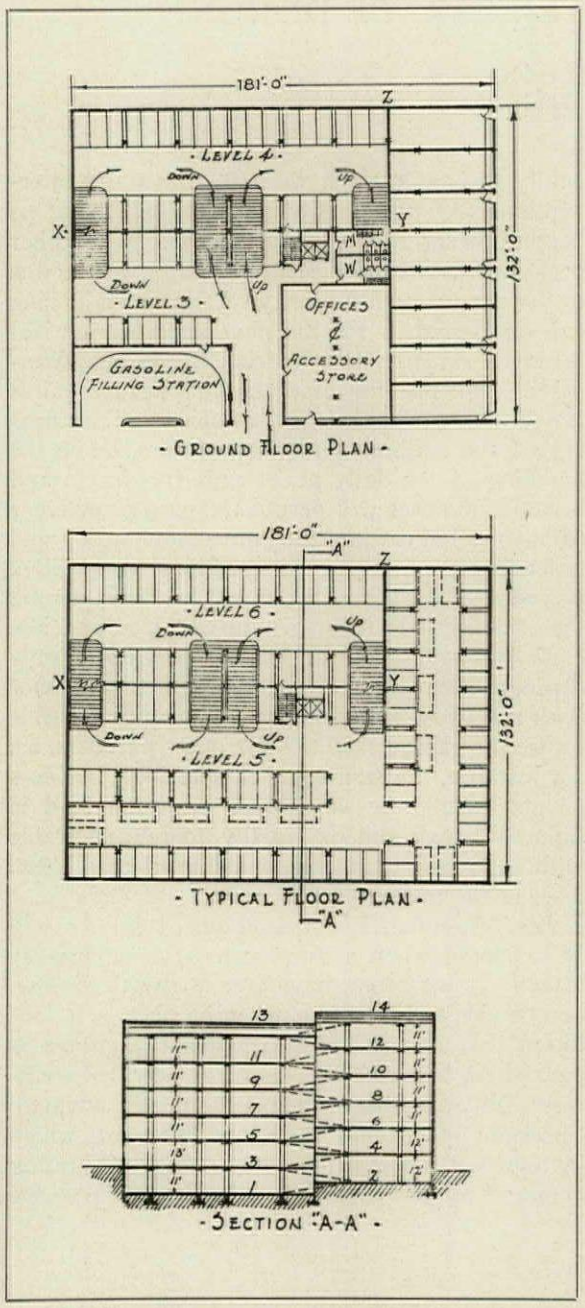
General Conditions. In its relation to a hotel, a garage is in the same category as a laundry in performing a service necessary to the comfort of the guests. As with a laundry, a garage may be owned and operated by a hotel, or it may be a business separately owned and managed but with an agreement by which the hotel may or may not profit. If it is of outside ownership but bears the hotel's name, the house will suffer from delays or other poor service, and for this reason it should protect itself by having some form of control over the management.

Handling Peak Loads. A garage supported by a hotel alone will be subject to peak loads of two classes, and will earn its prestige by its ability to handle them without delays and interruptions. One peak is annual, and will be at its height during the vacation season. The other peaks will be of daily occurrence and will be due to the exodus of a majority of the guests during a brief period in the morning and their arrival during a similarly brief period in the late afternoon. The meeting of the annual peak requires the provision of sufficient floor space for the storage of the maximum number of cars, while the handling of the daily peaks calls for design and organization that will permit the prompt delivery of any desired car and the immediate housing and unloading of arriving cars without congestion. Keyed to these peaks, there will be losses during the slack periods through unused space and idle employes, and overhead can be held down only through design that will give satisfactory service with a staff of minimum size. It may be possible to use the garage facilities for other purposes, as, for instance, the storing of cars of local business people during the day when the hotel load is light, although this is usually more practicable with a garage separate from the hotel than when it is on the property.

Ideal Service. The maximum of service will be rendered when a guest can go from his car directly to his room, have free access to his car, and be able to take it out when he pleases, a condition that is possible only when the garage is part of the hotel. This is now the accepted treatment, and one that is being commonly adopted. Success is dependent on design, however, which in turn will depend upon the general operating plan and the proposed balance of income plus the

Interior and Exterior of the Statler Hotel Garage, Buffalo

George B. Post & Sons, Architects



Staggered Floor Ramp. Garage for Statler Hotel Buffalo

Typical Floor Storage. Berth Storage, 98 Cars at 244 Sq. Ft. Per Car; Aisle Storage, 13 Cars; Total, 111 Cars, 216 Sq. Ft. Per Car

value of the service to be rendered against expense and overhead.

It is obvious that income will increase as more cars are stored in a given space; but this on the other hand will usually lead to a slowing down of delivery time, the need of more employes, and greater risk of accidents that may result in damage suits. Reducing the number of cars gives more handling space, and accurate driving then not being so necessary, fewer employes will be required through permitting owners to park their cars themselves.

Inter-floor Travel. The problem of design is simplest when a garage occupies but one floor and is on the street level. This will rarely provide sufficient area, however, and there must then be a selection of means for inter-floor communication. The choice will be between ramps and elevators, the former operating by the power of the cars and therefore without expense to the garage, and the latter requiring the purchase of electricity. Neither is best for all conditions; choice will depend on available floor space, the desired facility in handling peak loads without congestion, and other local and individual considerations.

Ramps. In buildings of usual design, ramps will be long, and whether straight or curved will call for skill in driving that may be beyond the average driver; in such cases, cars will usually be handled within the garage by trained employes. In the d'Humy ramp garage the staggering of front and rear floors permits the ramps to be short and straight; they are safely negotiable by drivers of ordinary ability, and their use greatly reduces the chance of accident. Ramps of two-car width, especially when arranged for one-way traffic, allow maximum speed in receipt and delivery, for there is free communication between every stall and the street. It has been shown in practice, however, that while owners will drive up one or two levels, they may be unwilling to go much higher. If this is necessary, they will leave their cars on a lower floor for further handling by employes, who will be required in greater numbers as the height of the building is increased.

Elevator Systems. With elevators, all levels are equally accessible, and a number of plans are in operation or proposed for maximum utilization of space and for a reduction in the number of employes through automatic handling. In ordinary design an elevator that may be of two-car capacity connects on each floor with a runway to the stalls, cars being driven in and out by employes. The Kent Garage in New York provides machinery for the handling of a car from the entrance, where it is left by the owner with locked controls and doors. By a series of power-driven dollies it is loaded onto an elevator, placed in a stall and when wanted moved to the exit door. Lateral shifting devices are provided for the utilization of spaces wider than the elevator. Another system is based on elevators carrying six cars on two decks at right angles, and fitted with tilting runways for unloading by gravity. Similar tilting runways in the stalls return the cars to the elevator. In the Rotafloor system the elevator is surrounded by a rotatable ring of sufficient width for radial parking, the rotation of the ring bring-

ing any stall into line with the elevator for the reception of a car or for its delivery.

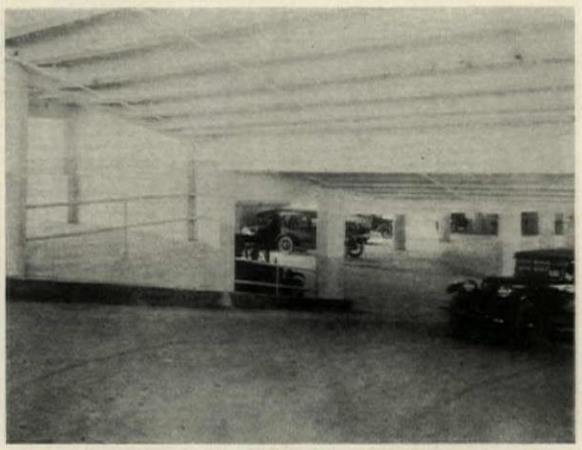
Set in a large floor, cars cross it to parking spaces in other parts, the ring being used for storage only when the other stalls are occupied.

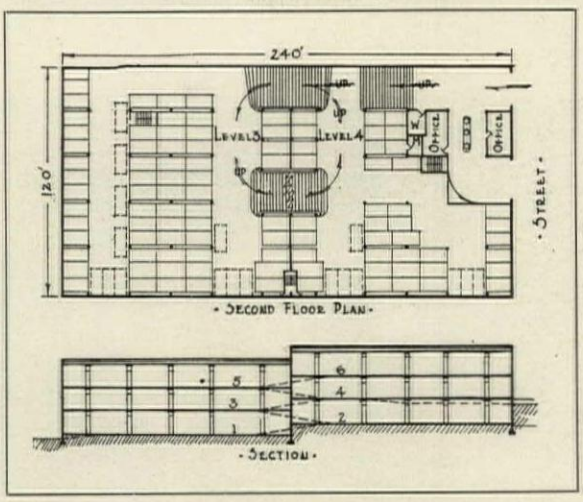
Such systems utilize floor space to maximum efficiency, and for certain types of garage, as well as in reduction of personnel, they are undoubtedly of great value. When supplying garage accommodations is part of the service of a hotel to its guests, however, there is more than this to consider, for the slowness of elevator service may lead to dissatisfaction. An elevator averaging two minutes to the round trp, including loading and unloading, would be operating at as high speed as could usually be expected; but the limit of 30 cars an hour that could thus be handled by a one-car elevator is likely to be too little to meet the daily peaks.

Ramp-elevator System. When but three garage floors are provided,—basement, street floor and first floor, or sub-basement, basement and street floor,—the ramp system will give quicker service, while for a greater number of floors it is probable that the best results can be had with a combination of ramps and elevators. In this case, cars would discharge their loads on the floors connected by ramps and would remain there until the subsiding of the rush gave time for the employes to remove them by elevator to the storage floors. The outgoing peak would be prepared for by returning the cars to the ramped floors. With the ramped floors serving as reservoirs to absorb the peaks and the elevators for later distribution and earlier collection, this combination should provide the maximum of speed and convenience.

Parking Machine. The Westinghouse parking machine recently introduced should have consideration for certain uses, for while the units are at present limited in size, they can be arranged in batteries of large gross capacity. This machine consists of two endless chains passing over wheels top and bottom, with platforms suspended between them of a size for one car each. Any platform can be brought to the entrance level by the pressing of the appropriate push button, and a car driven into the machine occupies its platform until called for. An existing installation provides storage for eight cars, and it occupies no more ground space than an ordinary two-car garage.

Facilities. As a garage management will be held responsible for the care of cars and other property in its charge, theft should be guarded against by providing but one entrance and exit, an arrangement that also facilitates checking in and out. At this point the design should also include a sales space, for revenue from the sale

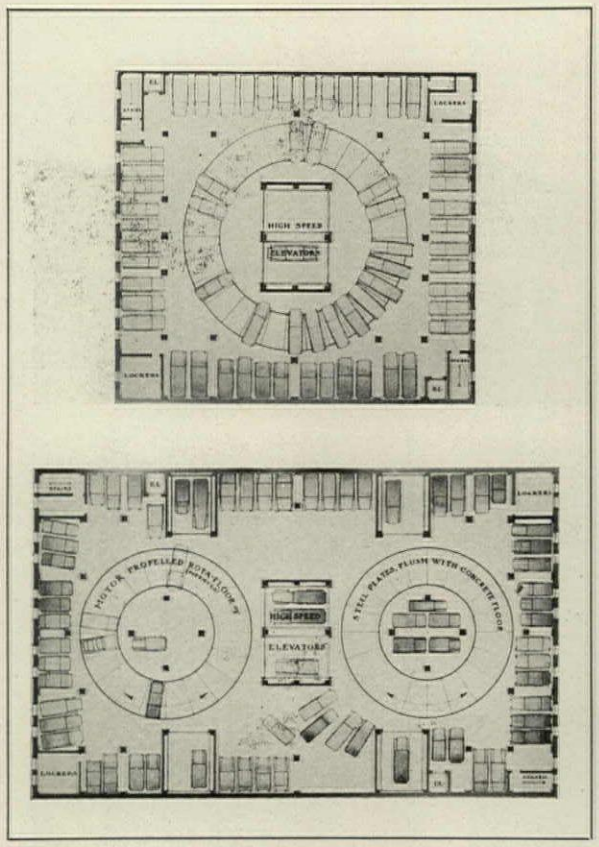




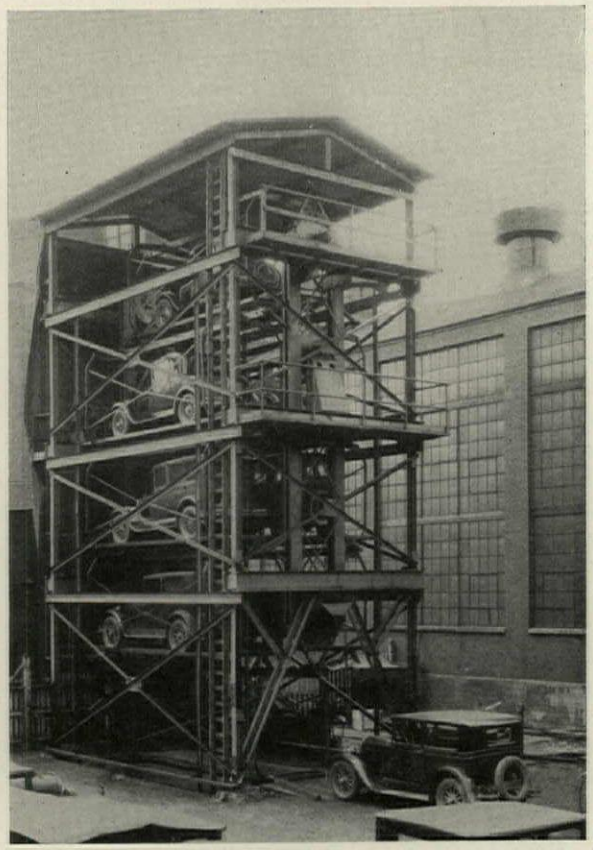
Exterior, Interior, Plan and Section of a Staggered Floor Ramp Garage. Olympic Hotel Garage, Seattle

Robert Reamer, Architect

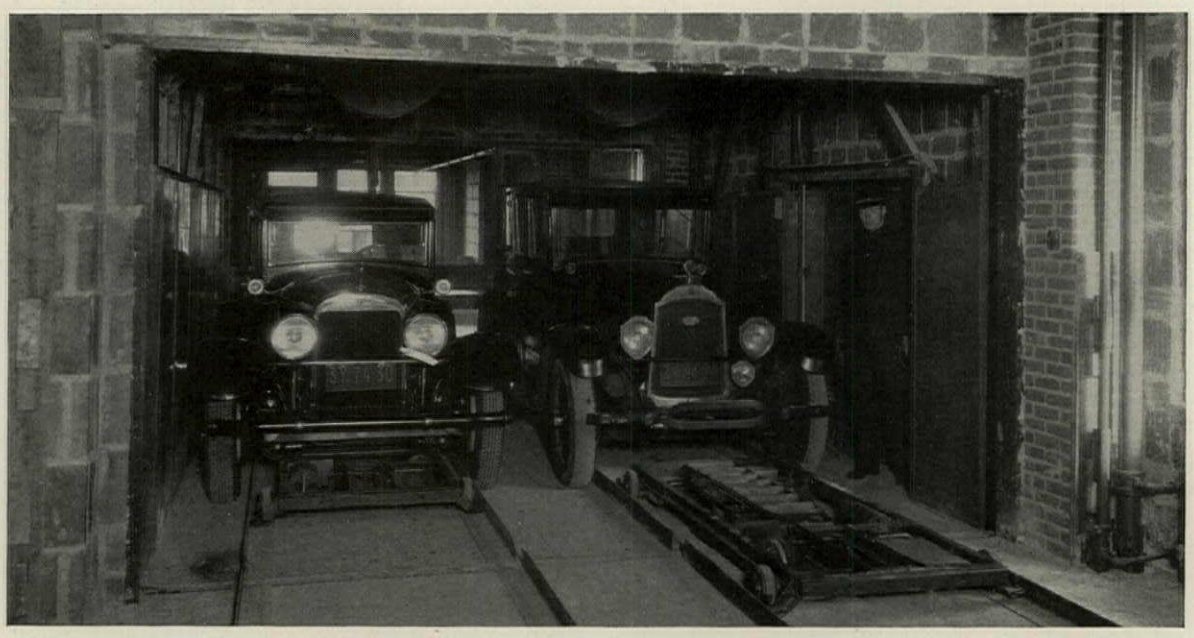
of gasolene, oil, tires and other accessories should amount to a considerable percentage of the total income. Here also there should be a waiting room to which baggage can be brought, and for use of guests whose cars are being serviced or otherwise detained. The importance of this part of the project becomes apparent when it is realized that to guests traveling by car, the first impression of a hotel will be made by its garage.



Garage System that Combines High Speed Elevators and Rotating Floor Section



An Elevator Parking System Built on the Principle of a Continuous Belt



An Elevator Garage System which Permits Cars to be Locked by the Owners. Subsequent Handling and Parking are Accomplished by Means of the Trucks Shown

HEATING AND VENTILATING OF HOTELS

BY
HARRY J. CULLEN
CONSULTING ENGINEER

THE usual method of heating a hotel is by direct radiation, generally located under windows and exposed in bedrooms, stores, etc., but concealed in the main lobby, dining rooms, ball rooms and other public spaces.

The type of heating system in a commercial hotel building is usually a two-pipe, down-feed, vacuum return. An attic space of about 6 feet is provided at the top of the building below the main roof, where the steam main is run from a main steam riser located in a main pipe shaft extending from the boiler room up to the attic space. The attic space also contains ducts for bathroom ventilation and plumbing pipes. The object of running steam mains in the attic space is to gain more head room under return mains on the basement ceiling, as rentable space is usually available in the basement for billiard rooms, barber shops, boot black and coffee shops, etc.

One Pipe Steam. There are various types of direct steam heating systems that may be applied to the average hotel. There is the one-pipe steam heating system with an air valve on each radiator. This system is the cheapest to install, but the disadvantage is that in a fairly high building the steam risers will be too large, as the condensation from the radiators flows back in the steam risers and mains to the boilers, and if large pipes are not provided there is the possibility of waterhammer in the mains. The air valves, if not of a good make, will require readjustment frequently, as one may have seen steam or water escaping from many air valves on radiators. If a good type air valve is used, this trouble will be eliminated, but it is an easy matter for anyone requiring an air valve to "lift" one from any radiator in the hotel.

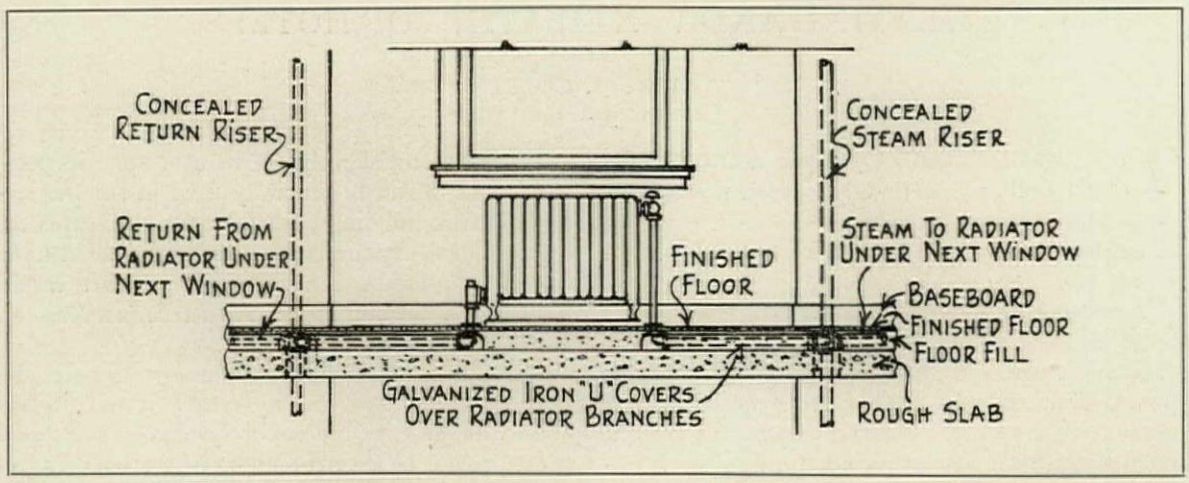
Air Valves. A one-pipe steam heating system, when starting up, requires considerable time before the radiators are all hot, as all the air in the system must be expelled through the small holes in the caps on the air valves. If vacuum air valves are installed, they prevent the air from reëntering the system when the fire in the boiler is banked. But if this type of valve is used, the joints in the pipes and packing around the valve stems must be absolutely tight, or the air will leak into the system again at these points.

Two Pipe Vapor. Another type is the two-pipe vapor system, which has an advantage over the one-pipe system, as it does not require any air valves on the radiators, the air being removed from the system by an air eliminator located in the boiler room. This system supplies steam to the radiators at or slightly above atmospheric pressure (212°) and is generally used in smaller hotels or bank buildings, but in large structures requiring about 2 pounds pressure in the boilers due to loss of pressure in mains, this pressure would blow the seals out in the return connections on the radiators.

Two Pipe Gravity. Still another type is the two-pipe, open end, gravity return system. It has an advantage over the vapor system, as the steam pressure can be 2 or 3 pounds in the boilers, and may be raised to 5 pounds if necessary during cold weather. This type of system also has an air eliminator, or alternating receiver, located at the boilers, which allows the air in the system to escape, and returns the condensation to the boilers. The radiators for this system are of the hot water type with a moderating valve on the steam connection at the top of the radiator on on end, and a thermostatic valve on the bottom of the radiator at the opposite end. The modulating valve may be opened as required to allow a certain amount of steam to enter the radiator to keep the room at a comfortable temperature. The thermostatic trap valve permits the condensation to leave the radiator, but does not allow the steam to escape into the return risers; when the steam comes in contact with the thermostatic element in the radiator trap, it expands and shuts the valve until the steam condenses, then opens, permitting water to flow into the returns.

Hot water systems of heating are rarely used for heating hotels. It is an excellent system to install in residences, but the disadvantage is the possibility of the pipes freezing up if the fire in the boiler is allowed to go out. The hot water system would hardly do for a hotel, since some guests like to sleep with their windows wide open, winter and summer, and on a very cold night there would be the possibility of the radiator in such a room freezing up and cracking.

The Two Pipe, Vacuum Return System is about the best to install in a hotel. This system is the same as the open-return system with the exception that a vacuum pump is installed in the return system instead of the alternating receiver. This system heats up very rapidly, due to the vacuum maintained in the return mains and risers. There are also various high vacuum systems where a vacuum is created throughout the system. The advantage is that the steam under a certain vacuum can be anywhere from 180° to 212°, resulting in a saving



Detail Showing Radiator Branches in Floor Fill

of steam, but this type of system must be absolutely tight to prevent any air leakage into the system. There are many makes and types of radiator valves and traps. The supply radiator valves may be either packless, modulating type with indicator plates, or the quick-opening, packless type; either type can be furnished with lever handle or wheel handle. The radiator return traps are either of the disc type, the metal bellows type, or the expansion type. The radiators used in a hotel are usually cast iron, plain pattern, of the new tube type.

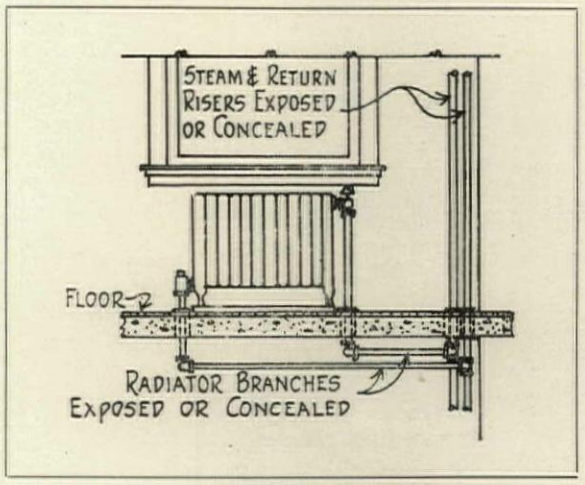
New Type Radiators. Fantom type radiators are frequently installed in bedrooms where metal windows and sills are provided, and hung on special hangers from window sills. Where wooden frame windows are used, the tube radiation is often installed, either legless and hung under sills, or the leg type radiation set on cement bases extending about 1 inch above the finished floor. This cement pad allows the carpet to finish around it. Fin radiation is also sometimes used under window bulkheads in stores and shops in a hotel, with a grille located on the face of the bulkhead; and the radiator enclosure is lined with galvanized iron and asbestos board. Wall type radiation is frequently used on ceilings of basement rooms requiring heat, and also in toilet rooms having high window sills, and sometimes in house tank rooms on the roof, instead of pipe coils, and where space conditions are limited, such as on stairways, in corridors, etc.

Radiator Location. In placing radiators, the usual practice is to locate them under windows, but in some hotels, to save expense, radiators have been placed at side walls near windows and close to risers. This arrangement permits a higher radiator to be used, a type which is less expensive than a low radiator, and it saves considerable piping for radiator branches, as the radiator is located nearer the risers. However, it may interfere with furniture.

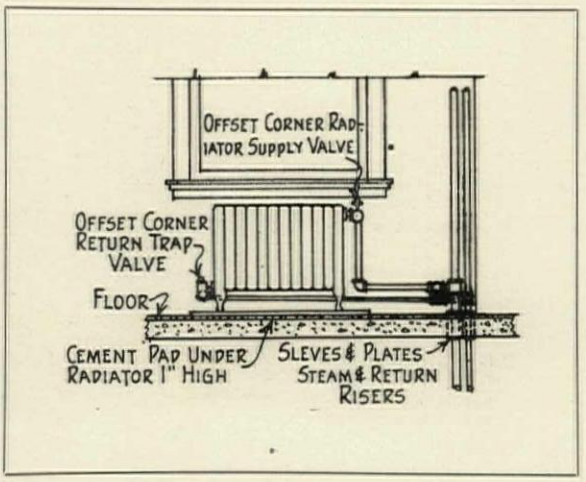
Vestibules. In vestibules concealed radiation is installed, as these entrances are in most cases provided with revolving doors that prevent excessive air leakage. In some of the larger hotels, a small hot blast system has been installed in vestibules, the system consisting of a fan, motor heater, connecting duct work and registers, and arranged so that air is re-circulated and heated from about 60° to 100°, and discharged into the lobby, thus creating a slight pressure and preventing a large influx of cold air and heating up space very quickly.

Baths. The bathrooms are frequently heated by means of fin radiators, having metal covers, with enameled finished baked on, and the radiators are located under traps from lavatories. These small radiators are of about 3½ square feet of radiation each. The advantage of using this type of radiators is that they are light in weight and do not require radiator hangers and are supported by the pipe connections to the radiators. The risers for the bathroom radiators are run in pipe shafts for plumbing pipes, and the radiator branches run in the furred ceiling of the bathroom below, as the bedroom floors are typical and the bathrooms are located typically one above another. The branches to a bathroom radiator should be arranged to come out through the side wall of the bath instead of through the floor, as openings in the floor, if not tight, will permit water leakage through floor sleeves to the room below when mopping the floor of the bath.

Radiators, when placed against side walls and under windows, should be provided with metal covers on top to prevent the wall above the radiator, and window curtains, from becoming soiled by dust. Where fantom radiators are used and



Radiator Branches on Ceiling Below



Radiator Branches Run Above Floor

located under windows, with a metal window sill projecting over, the metal sill should be solid and not perforated, the top of the radiator being located about 1 inch below the lowest point of the sill to allow for circulation of air. This method will prevent dust's collecting on the curtains and draperies of the windows, and they will not require as frequent washing as with the perforated sills. Consequently, they will last longer. There are various types of radiator covers, and some have marble tops and water pans to moisten the air, if required.

Figuring Radiation. In figuring exposed radiation, the usual allowance in B.t.u. losses are made for wall, glass and air leakage, and other exposures, such as roof, etc., and percentages are added for exposure, such as for north, west, etc. Allowance should also be made for bathroom's exhaust ventilation in figuring the radiation for a bedroom. For fantom type radiation enclosed on sides, top and bottom, 8 to 10 per cent should be added to the square feet of radiation required in a room; for enclosed radiation 25 per cent should be added to the amount of radiation required in a room. The front and top grilles for an enclosed radiator should be at least 12 inches longer than the radiator, and the grilles should be provided with access doors for reaching valves on radiators. The supply valve on an enclosed radiator should have an extension spindle to face or top of enclosure for easy operation of the valve.

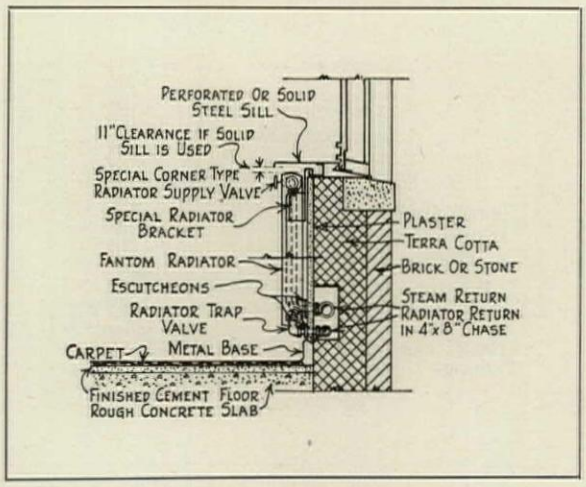
In figuring the amount of direct radiation required for a store or a vestibule, from 25 to 50 per cent should be added to the radiation to allow for excess air leakage every time outside doors are opened, where revolving doors are not used. Where a hot blast system is used to heat a vestibule, the amount of heated air required and the final temperature of it must be determined in designing this type of system, based on the heat losses for these spaces.

Direct-indirect radiation is rarely used in hotels, but unit ventilators are sometimes used for ventilating various spaces, such as ball rooms, convention halls, club rooms, etc.

Piping. Steam and return risers may be either run exposed or concealed in the bedrooms. In lobbies, etc., they are run concealed. Risers are generally located at columns, and where concealed, are furred. If risers are run exposed, they may be either bare pipe and painted, or covered with asbestos, and the pipe covering protected with a galvanized iron casing, about 7 feet high. The radiators in the lobby, writing rooms, lounges, dining rooms and similar spaces are generally concealed, as these are finished rooms. The radiator enclosures are provided with front or front and top grilles, or a grille in the sill. The fronts of radiator enclosures should be made removable, or if a large grille is provided in the front of the enclosure, it should be large enough so that the radiator could be removed through it in case of its needing repairs. This also applies where a small grille is provided in the front and a grille in the sill. The latter grille should be large enough so that the radiator could be lifted out through the top of the enclosure.

Radiator branches may either be run from risers to radiators above the floor, exposed, or in floor fill protected with U-shape galvanized iron covers, or exposed on the ceiling below, or they may be furred in over window heads, or run in a horizontal pipe chase back of the baseboard in bedrooms. The method of running the radiator branches is for the architect to determine. The radiator branches for radiators in lobby, dining rooms, etc., are usually run in the floor fill.

The medium pressure steam and high pressure

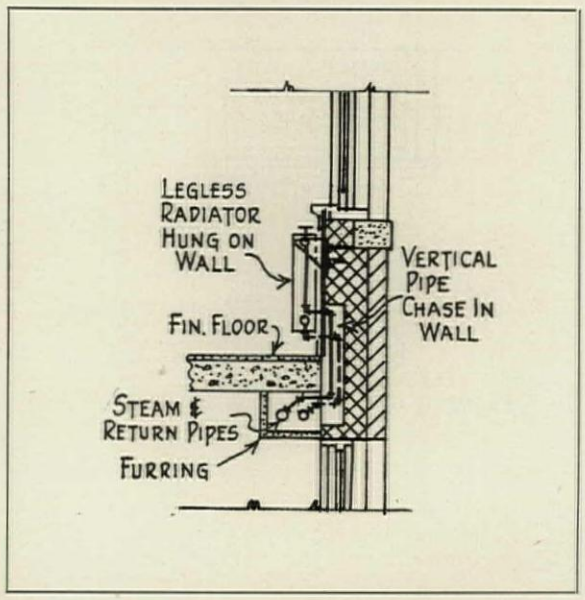


Hung Radiator with Metal Window

steam piping should be covered with 85 per cent magnesia covering, and re-canvased; the low pressure, steam returns and drip piping covered with air cell covering. The steam and return risers are usually covered with ¾-inch thick covering, the radiator branches with ½-inch thick covering, and the mains with 1-inch thick covering. The boilers, smoke brushing and hot water tanks should be covered with 1-inch thick 85 per cent magnesia blocks wired on over a 1-inch air space, and ½-inch coat of asbestos cement applied over blocks troweled to a smooth finish.

Boilers. Various types of boilers are used, depending on the service required. In a small hotel, without a laundry, and with the kitchen using gas instead of steam, low-pressure, cast iron sectional boilers are installed to heat the building and for hot water supply, thus saving excavation. In a larger sized hotel, having a laundry (which requires steam at from 80 to 100 pounds pressure) and a kitchen (which requires steam at from 30 to 40 pounds pressure), water tube boilers or fire tube boilers are usually provided, built for 100 pounds working pressure. Many new hotels are installing electric generating plants, also steam-driven refrigerating plants, as the exhaust steam from the engines, ammonia compressors, pumps, etc., is available to heat the building in the winter, for heating the water required for the hotel, and for heating the boiler feed water. As a hotel with a laundry requires steam at from 80 to 100 pounds, the steam electric generating plant can also be operated at this pressure, and where rates are high, a hotel with its own plant can often generate electricity more economically than it can purchase it.

Boiler grates are generally furnished to burn buckwheat coal, and in some cases soft coal or run of mine coal, in which case they are provided with forced draft and automatic stokers.



Method of Concealing Radiator Branches

The type of coal burned depends on the location of the hotel, the grade of coal, and the price obtainable. In some locations, the boilers are arranged to burn natural gas. A fair sized hotel will require about from two to three 200-horse power boilers, and will require a ceiling height in the boiler room of about 20 feet. The sizes of the boilers depend on the steam required for heating, ventilating, hot water supply, kitchen, laundry, etc. In smaller hotels it is usually customary to install two boilers, both built for 100 pounds working pressure, the smaller boiler being a sufficient size for kitchen and hot water supply, and the larger size boiler having sufficient capacity for the total steam requirements. It is an advantage to have a spare boiler in case one boiler breaks down.

Where low-pressure boilers are installed and the heating system is of the vacuum type with vacuum pumps, it is desirable to install a small summer steam boiler for hot water supply. The hot water heater should be cross-connected with the large boilers and the small summer boiler, and the drip from the heater cross-connected to the vacuum return, and to the summer boiler return, and provided with a quick air vent. This is desirable so that the heater may be used without its being necessary to operate the vacuum pumps in the summer. In some hotels the owners want separate steam mains to radiation in public spaces and stores, so that steam may be shut off in the bedrooms during the night, but will be available in the public spaces.

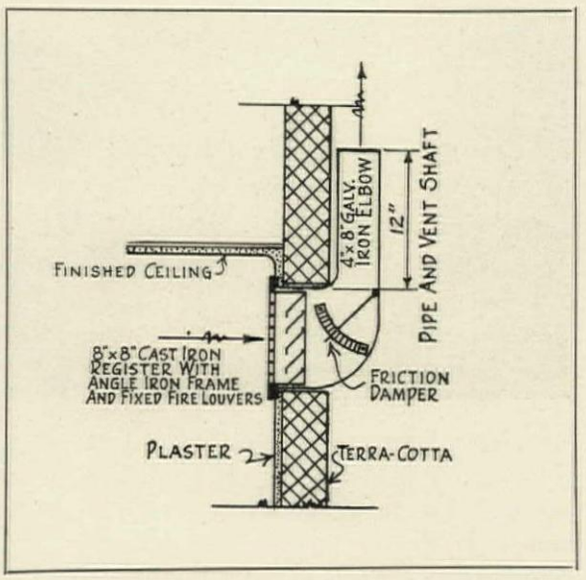
Ventilation. The hotel generally needs supply and exhaust ventilation in all spaces in the basement, in the lobby, main and private dining

rooms, ball rooms, convention halls, bathrooms, private offices, cafeteria, coffee shops, etc. Very often, however, when the hotel is rented to an operating company, the management does not operate the complete ventilating systems because it costs too much for the steam and electricity required. The result is that they operate only the kitchen exhaust system and the bathroom exhaust system. In one hotel the firemen were using the air washer for a coat closet, and the engineer had disconnected the air washer pump and was using it for another purpose.

In designing an economical ventilating system for a hotel, supply and exhaust ventilation is provided for the barber shop, boot black room, billiard room, public toilets, and other public spaces in the basement. Exhaust ventilation is provided in the main kitchen, cafeteria kitchen, serving pantries, main dining room and lobby; and exhaust ventilation is provided for interior bathrooms.

Kitchen Ventilation. In the kitchen, which should have outside windows and skylights, exhaust ventilation is taken out through the range hood, dish-washing machine hood, coffee urn hood, and from over bake oven and pastry stove. From 20 to 30 air changes should be provided per hour depending on the size of the kitchen and the kitchen exhaust fan, located in the fan room and on the roof over the kitchen. In some kitchens, fresh air has been provided in front of the ranges by swivel outlets, but in many cases the chefs have blocked up the fresh air openings as they object to the drafts. A perforated steam pipe must be located in the range hood so that steam can be turned on in case of fire in the hood, and the kitchen exhaust fan should be provided with an electric thermostat to shut off the fan in case of fire in the flue.

Public Room Ventilation. If supply and exhaust ventilation is to be provided in the lobby, etc., the supply should be taken into the room at about 7 or 8 feet above the floor (depending on the ceiling height), and some exhaust be taken out near the floor and at the ceiling (for smoke), and the registers arranged in these rooms to get a good distribution of the air. Ball rooms and convention halls should be provided with both supply and exhaust ventilation on separate systems, the fans being located in fan houses on the roof above these spaces. The supply registers should be located on the side of the room where the windows are located, about 7 or 8 feet above the floor, and the exhaust registers located opposite the supply registers, some near the floor and some in or near the ceiling. This arrangement will permit the exhaust system to be operated alone in the summer time when the windows may be opened for ventilation.

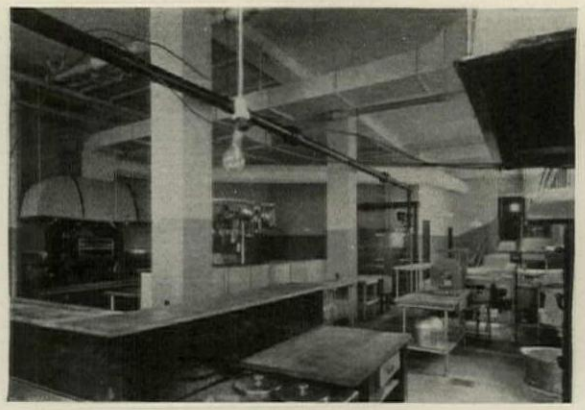


Vent Register for Interior Bathroom

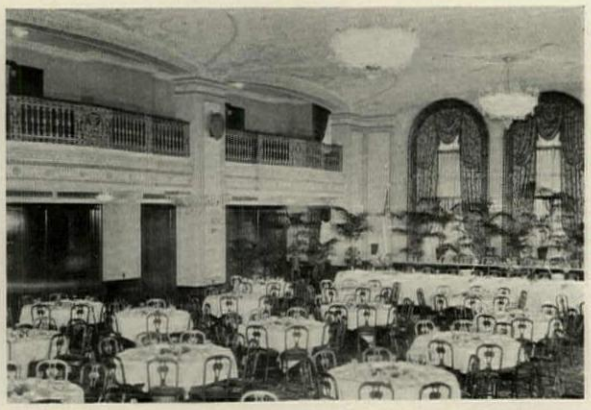
Boiler Room Ventilation. The boiler room in a small hotel is not usually ventilated, but there is an ash hoist shaft provided to the sidewalk level which is ample to ventilate a small boiler room. In larger hotels, forced draft is provided for the boilers, and the air is taken from the boiler room for this purpose. The air supply is through either openings or windows to outdoors or through the ash hoist shaft. Where steel smoke stacks are installed within a masonry enclosure, the space between the stack and enclosure is open at the top and bottom and this space can be utilized also for ventilating the boiler room. A hood placed over the top prevents the rain from coming in. Engine rooms should be provided with both supply and exhaust ventilation, the supply registers located on one side of the room and the exhaust ventilation registers located over engines (which give off considerable heat) if possible.

The basement floor, where below grade, is not usually heated (with the exception of barber shops, public toilets, etc), as the heating mains located at the ceilings of these spaces give off considerable heat, but plugged outlets can be provided in mains so that wall type radiation or pipe coils can be installed on the ceilings of these spaces at any time, if required.

Ventilating Interior Baths. The interior bathroom is usually ventilated by means of a register located near the ceiling, connecting to a galvanized iron elbow having a friction damper and turning up 12 inches in pipe shaft. The bathroom registers must be provided with fixed fire louvers, and the tops of the pipe shafts are connected by ducts to the bathroom exhaust fan



Necessary Exhaust Ducts over Kitchen Range are Shown in this Hotel at Concord, N. C.



Supply Grilles under Mezzanine, Exhaust Grilles in Ceiling, Lord Baltimore Hotel, Baltimore

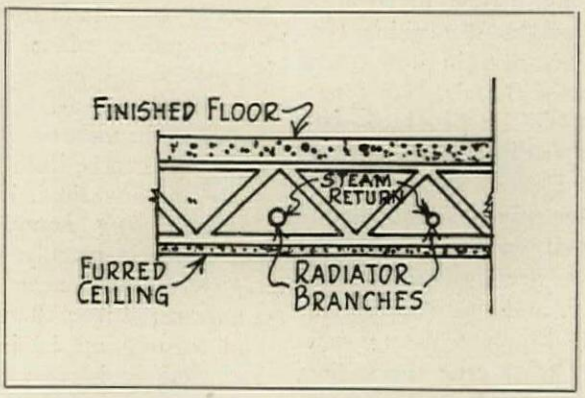
suction. The bathroom exhaust fan is usually located in the fan rooms provided under the house tank. Slots or grilles are provided at the bottoms of the bathroom doors, to allow circulation of air through the bathrooms. The best practice is to install galvanized iron vent flues in pipe shafts connecting to each bathroom register, and connecting these flues to the horizontal duct work in the attic space of the bathroom exhaust fan suction, as the masonry shafts in many cases are not tight, and with elbows turning up in shafts, they catch all the mortar, plaster, dirt, etc., dropping down the shaft from above.

Ventilating Equipment. Fan and motor foundations should consist of yellow pine frames set on cork blocks to prevent transmission of vibration to the building structure.

The fresh air intakes for fans can be taken in at any areaway or window, or from any roof or court convenient, the supply fans being located in the basement. The discharge from exhaust fans may be carried to any convenient point, but should not discharge near any window in guest rooms or near the fresh air intake. The exhaust fans may be located in the basement or on roofs where convenient. The supply ventilation system should have air filters, of easy cleaning type, and also an air washer. Tempering and re-heater stacks may either be cast iron, vento type, or fin type.

Temperature regulation should be provided in connection with the ventilating system, as well as for direct radiation in all public spaces. Direct temperature control valves may be installed on the direct radiators where required.

In some hotels 18 or 20 stories high, where the stairways open into a main lobby without any doors closing off the stairway, there will be considerable draft in winter if these stairways open at the top to the outside air or if the door to stairs at top floor is opened and windows on top floor open. The stair halls act like a large asperating flue, and there would be considerable air leakage into lobby, etc. Doors should be provided at the bottom of each stair hall to prevent these drafts. Ceilings over boiler rooms and engine rooms should be insulated with 85 per cent magnesia blocks. Ceilings over kitchens in southern hotels where the ceilings are about 12 feet high, and the sun shines on the roofs practically all day, should be insulated to prevent the summer's heat from becoming unbearable.



Radiator Branches are Easily Accommodated in Steel Joist Construction

MODERN HOTEL LIGHTING

BY

A. D. BELL

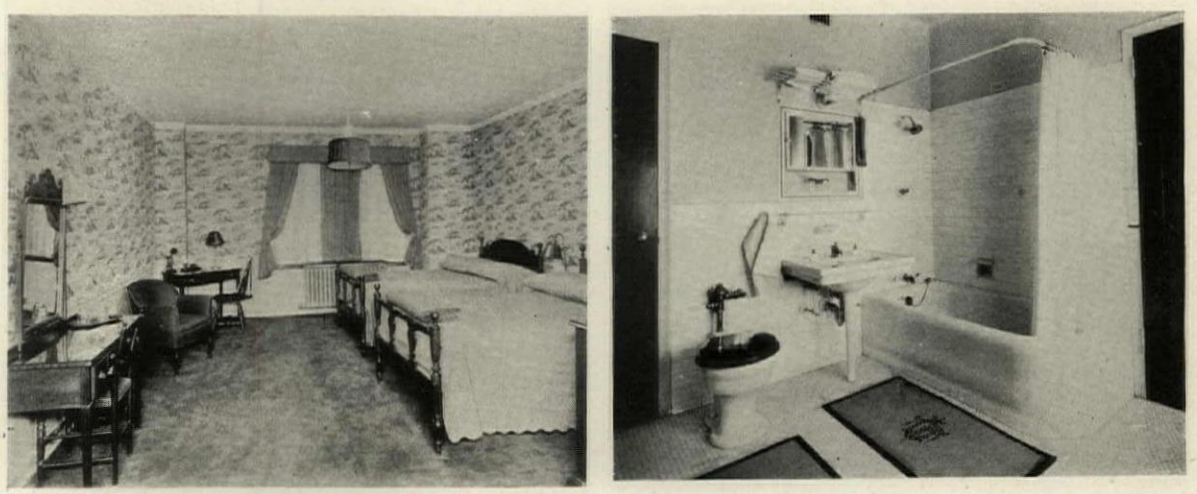
ELECTRICAL ENGINEER

AMONG the many refinements which characterize the well equipped hotel there is adequate and satisfactory artificial illumination. It serves not only for convenience, comfort and beauty but many operations of the heating plant, the laundry, the kitchens and other places are absolutely dependent upon it, as these areas are frequently cut off from all daylight. On account of their diversity of purposes the areas of a hotel logically fall into three sections; viz., guest rooms, public areas, and working spaces.

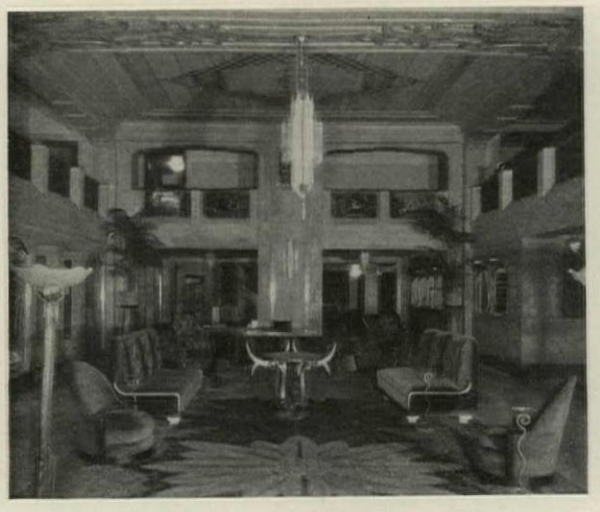
The Guest Rooms. While in general the guest room is used in the same manner as the bedroom in a residence, it must also serve at times as a living room, writing room, and office. The first requirement is a medium level of general illumination for the entire room. A central semi-indirect fixture or an enclosing globe is in general sufficient for this purpose, controlled by a wall switch near the entrance door. Many hotel operators prefer to have this switch operate a small light near the room entrance, so that when two persons share a room the one coming in late will not flood the room with light and so disturb one who may have retired. A local dresser light is essential, either suspended over the dresser or connected to a baseboard convenience outlet, and using in most instances 40- or 50-watt lamps. A bed light with a metal or fabric shade is a desirable feature, and it will generally require a 25-watt lamp. A floor or table lamp attached to a baseboard convenience outlet and a light for writing should be considered. The well appointed guest room has a light in the closet, which is a great convenience. Either the automatic door switch or the pull chain may be satisfactorily used for its control. The hotel bathroom is generally lighted by means of a pear-shaped glass reflector, the unit being placed directly over the lavatory mirror. This arrangement provides illumination for shaving and also for the whole room, but a light on each side of the mirror is better, although not often found. A fixture that provides a receptacle for electrical appliances, such as curling irons, vibrators, etc., is a great convenience.

For parlors or living rooms in connection with the guest rooms, a central ceiling fixture controlled by a wall switch is often found. Semi-indirect illumination is excellent, although other types of fixtures may be entirely satisfactory with one or more floor or table lamps. Many hotels have their larger guest rooms equipped to function as sample or display rooms in addition to the regular sample rooms. In rooms of this type, enclosing glass globes, spaced symmetrically on centers from 8 to 10 feet apart, employing about 2 watts per square foot of area, make a satisfactory installation. Convenience outlets with adequate capacity are also necessary.

Public Areas. In the lobby, dining rooms, mezzanines, etc., the accepted ideas on lighting are certainly quite different from those of a decade ago. The so-called "modernistic" lighting is being very extensively employed, and in appearance at least it is quite different from the "period" fixtures widely used previously. The period fixtures, while beautiful in a decorative sense, have



The Guests' Rooms Need a High Standard of Illumination with Lights Properly Placed. Bedroom Shows Central Semi-indirect Ceiling Fixture and Separate Lights for Dresser, Desk and Bed Table



Modern Lighting Fixtures of Frosted Glass Panels. Central Fixture Equipped with 13 25-Watt Lamps

Writing Room with Modern Fixtures for General Lighting. Ceiling Fixtures have 100-Watt Lamps

been too often unsatisfactory in regard to illumination, which is not surprising when one stops to consider that in their original forms they were made for candles and not for the incandescent lamps of today. The chief factors to keep in mind when using "modern" fixtures are: proper light distribution, low brilliance, absence of glare, and ease of cleaning and re-lamping.

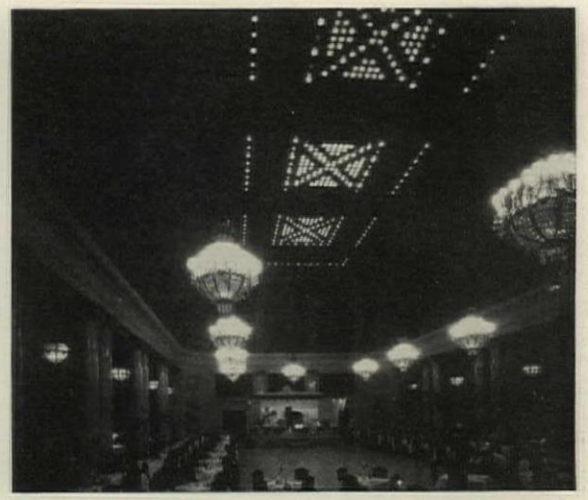
The Lobby. The lighting equipment desirable for the lobby is determined largely by the type of hotel. It is the point of contact between the hotel management and the public, and may serve as an office, lounge, reading and writing room. In smaller hotels and those of the residential type all of these facilities are provided in the lobby. Enclosed glass globes with or without decorations, or semi-indirect reflectors are satisfactory for a lobby of this character. For enclosing globes, from 1 to 1.6 watts per square foot may be figured; for semi-indirect fixtures, 2 watts per square foot. Occasionally wall brackets are the chief sources of general lighting, being supplemented at times by suspended fixtures of the candle type. Such a scheme is fairly satisfactory, provided that all lights are shaded. Plenty of floor and table lamps for reading and writing are absolutely necessary, however, as the general level of illumination will be low.

Informality and Comfort in a Grill Room, Lighted by Lanterns, Each Having a 40-Watt Lamp

For the larger lobby there are many methods of suitable illumination. Artificial skylights, cove lighting, suspended fixtures of the candle type, indirect or enclosing globes may be used. There is a choice of the older forms of fixtures or the modernistic. In any event, adequate provision for floor and table lamps should be made for reading. For the actual illumination the necessary wattage should normally range between 1 and 3 watts per square foot. Adjoining the lobby are the offices, where it is advisable to provide about 12 foot candles to facilitate accurate work. Semi-indirect or enclosing globe fixtures are desirable, the former requiring from 3 to 4 watts per square foot, and the latter from 2.5 to 3 watts per square foot. The offices of the cashier, bill clerk, etc., should in addition have local units along the front upper edge of the grille, as in a bank, with the light directed on the counter.

Dining Rooms. In this division of the hotel a variety of types is encountered, ranging from the lunch counter to the formal dining room. For the lunch room, coffee shop and cafeteria and dining places of a similar character, the illumination should be of a much higher level than in the main dining room, grill room and the like. For the former, enclosing globes or semi-indirect fixtures of a simple type are excellent, allowing

Dining Room Having Chandeliers and Brackets of the Candle Type. Local Table Lights are Provided



Hotel Roof Garden. Glass Panels of Skylight Give a Variety of Color Effects by Using Several Circuits

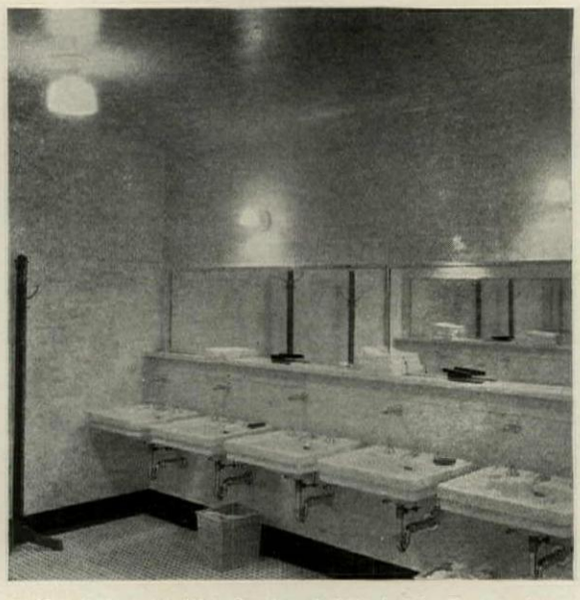
from 1½ to 2 watts per square foot for adequate illumination. The main dining room requires, first of all, a medium level of general illumination. This should be evenly distributed, and it may be provided by many different schemes. In any event local lights are desirable for the tables. In the grill room also the illumination should be of subdued variety as the guest there, too, is inclined to take time and accordingly enjoy the surroundings. Lighting fixtures appropriate to the architecture of the individual grill room will give to it a much more attractive appearance, such as is the case of a room with dark beamed ceiling where fixtures of the lantern type give the idea of the old time tavern. Supplementary illumination by means of wall brackets is sometimes desirable when the ceiling is low. A wattage of from 1.5 to 2 watts per square foot should be provided.

Roof Garden. This is mainly a place for seasons of warm weather only, and as it will be patronized for dancing as well as dining, it requires an atmosphere of festivity and freedom. Colored lighting effects may be employed, and novelty is a desirable feature. Enough outlets with a wiring capacity of at least 4 watts per square foot should be installed to allow for future equipment. Pendent lighting fixtures are sometimes used, but more often more elaborate schemes are provided, such as artificial skylights, recessed glass panels, or false ceilings of colored textiles with lights behind them. Special lighting effects for the dance floor are often obtained by special apparatus such as is employed in the theater. Similar lighting effects may be well employed in the main dining room and grill room in case there is the possibility of dancing there.

Ball Rooms. The hotel ball room is used for a wide variety of purposes, from a formal dance or amateur theatrical to an automobile show, and therefore special lighting service must be provided. Central ceiling fixtures are satisfactory for general lighting purposes, and well shaded wall brackets to match give additional illumination. From 2 to 4 foot candles gives an adequate level of illumination for general purposes. In planning the wiring a large number of convenience outlets should be provided, so that the lighting for booths, etc., can be connected. It is well to run in heavy feeders terminating in a special service box for temporary installations. On the balcony and on the main floor standard stage pockets of high capacity prove most convenient for spot and flood lamps. With the ever-increasing use of colored lighting as an element of decoration, it is well to keep in mind the possibility of such effects, and to provide sufficient wiring capacity.

Soft, Restful Lighting is Provided in this Hotel Lounge by Using Chandeliers and Wall Brackets of the Candle Type

The Hotel Kitchen Demands a High Level of Illumination and Efficient Lighting Units



Good General Illumination is Needed in Lavatories, Supplemented by Local Lights over Mirrors

Lounge and Writing Rooms. Soft, well diffused illumination of a medium level is desirable, and light sources in any way glaring are to be avoided, for the guest is inclined to sit in such a place, and will notice objectionable light sources more quickly than in the lobby where there is more motion. In the writing room, the fixtures for general illumination may be similar to those used in the lounge. Small desk lamps should be provided, however, for local lighting of the desks.

Working Areas. The successful management of a hotel is due in a large degree to the proper functioning of many departments which are seldom seen by the guest. Too frequently a miscellaneous arrangement of bare lamps in ceiling sockets or on drop cords supplies the only illumination. Glaring, brilliant light sources are annoying to everyone and lower the efficiency of the chef, porter, maid or other employe.

Kitchen and Bakery. From the very nature of the work performed, these areas may be considered miniature industrial plants where quality is ever demanded at top speed. Adequate lighting allows for better supervision and preparation of food and promotes smoother and more efficient operation. Dome reflectors with white bowl lamps will provide excellent general illumination. Durable reflectors are often employed. Spacing of outlets on approximately 10-foot centers is good practice, allowing from 1.5 to 2 watts per square foot. To illuminate the ranges it is advisable to install a row of lamps on 2- to 3-foot centers along the inside front edges of the ventilating hoods.

Laundry and Tailor Shop. For the operation of washing machines and extractors a system of localized general illumination is satisfactory. Dome reflectors spaced on centers of from 8 to 12 feet will in most cases prove satisfactory. Flat work ironers generally require a localized light at both the feed and delivery ends. With ceilings from 12 to 14 feet high, diffusing fixtures mounted from 11 to 13 feet from the floor should be provided. The exact layout will depend on the arrangement of the ironers, but from 7 to 10 foot candles should be provided. Hand ironers will require a close spacing of lighting units, as this work needs a higher level of illumination. In order to detect stains, scorching, etc., in the different operations it is often advisable to employ daylight blue glass, as the resultant light will be more white in color.

Wiring. In order to insure adequate capacity for extra current loads and future development, the wiring system in a hotel should be considerably greater than for immediate demands, as many buildings today are prevented from employing modern lighting and electrical equipment because of the wiring's being of insufficient capacity to carry the required loads.

CONSIDERATIONS IN THE SELECTION OF ELEVATOR EQUIPMENT FOR HOTELS

BY

ROGER B. WHITMAN

WHILE the most evident need for elevator equipment in a hotel is the quick and convenient transportation of guests, it is quite as essential from the management's point of view to provide for swift restaurant, baggage and freight service throughout the building, for the distribution of incoming supplies, and for the removal of waste. The equipment will usually fall into two classes,—elevators running the height of the building for passengers and for service, and the more specialized elevators and hoists that operate from sidewalks to basements. The placement of these in relation to their duties and their operating costs will have a direct effect on the attitude of guests and on the success of the hotel, and for this reason the plans for their installation should be subject to the advice of the manufacturers of the equipment selected.

Relation of Service and Costs. Passenger elevator equipment should be capable of the speedy handling of full capacity traffic. This, however, must be balanced against limitations in floor space, investment costs, and cost of operation, that the fixed charges and loss of paying floor area may not be excessive for the service that is rendered. The equipment must therefore be considered from two points of view,—the favorable impression to be made on guests by quick and convenient service, and from the standpoint of the management, costs of investment, operation and maintenance. Both are affected by recent improvements that substitute mechanical and automatic operation for fallible human control, travel becoming more comfortable and capacity being increased.

Losses Through Manual Control. Speed in elevator service will be reduced, and motion will be jerky with slow approach to a stop, failure to bring a car to an immediate stop at floor level, coming to a stop before opening the doors, and delay in starting and in acceleration. To the elderly, the ailing, and to those to whom elevator travel is not a matter of course, such irregularities will be a cause for apprehension and will create an unfavorable impression, while to the management they represent losses of time and added expense. Even with expert operators they will be present in greater or lesser degree, and they can be eliminated only through the precision of mechanical control. These new devices should therefore be given full consideration.

Devices for Mechanical Control. The basic

Elevator Doors, Cosmopolitan Hotel, Denver
William H. Bowman & Co., Architects

Elevator Doors, Book-Cadillac Hotel, Detroit
Louis Kamper, Architect

Elevator, Hotel Statler, Boston
George B. Post & Sons, Architects

improvement is the automatic stopping of a car at floor levels, the action being so sensitive that there will be an immediate re-leveling of a car that sinks under the loading of great weight. The car travels at full speed until within the range of this mechanism, when de-celeration and stoppage occur smoothly and without jerking. This effect being assured, rapid unloading becomes possible through automatic operation of the doors, which begin to move during the last stages of leveling and are fully opened as the car stops. The doors are closed and the car started by the throwing of a switch by the operator. The pressing of an outside button stops the first car to approach in the desired direction, with no coöperation from the operator and without his knowledge that the stop is to be made.

Effects of Mechanical Operation. A hotel elevator is usually controlled by a lever in the car; but as hotels increase in height and area the elevator service demands become more nearly approximately those of office buildings, with the result that consideration is given to use of automatic types of operation. With this automatic form of control, the operators merely press buttons in the car to indicate the floor stops and initiate the closing of the doors. These close automatically, the elevators start automatically, and then stop automatically at all floors for which buttons have been pressed, either in the car operating panel or by waiting passengers on the floors. This automatic operation, with its self-leveling feature, permits much higher car speed than could be obtained with manual control, 700 feet a minute being usual and 1,000 feet a minute quite possible.

Unattended Elevators. Through further application of these devices, increasing use is being made of unattended elevators, the operation of the control buttons being by the passengers themselves. In earlier construction, an elevator in motion would be unaffected by other signals, would-be passengers desirous of traveling in the same direction being obliged to wait for service until the trip had been completed. Control is now so arranged that the elevator responds to these intermediate signals, with a saving of time, of power, and of wear. The control can be so arranged that a car on being emptied will automatically take station either at the top or the bottom of the shaft. Thus when travel is downward, the elevator on completing a trip will return empty to the top floor, that the next call can be answered in minimum time, while for upward travel its station will be at the ground floor.

When the size of the building requires two elevators, their controls are so coördinated that during periods of light traffic only one will be in operation; but should this be in motion when there is a further call, the second will automatically come into service and continue in action until demands are within the capacity of one elevator.

Unattended Elevators for Hotels. While unattended elevators are of proved reliability, they are practicable only when their users become as familiar with them as will be the case in a small residential hotel. For hotels with any proportion of transient guests, operators will be needed.

Service Elevators. The requirements in service elevators will depend on the separation between kitchen and dining rooms, the need of restaurant service in guest rooms, and similar conditions. In type, speed and capacity these elevators should be the same as for passenger service, the only difference being in finish of cars.

Sidewalk Elevators and Hoists. When sidewalk elevators are necessary for handling baggage and supplies, they will be of the standard types that have long been perfected. For the discharge of ashes, however, special hoists have been devised with the object of delivering ashes directly to the truck and so avoiding the setting of ash cans on the sidewalk and the need for labor in their further handling. While elevators and hoists for these uses concern solely the management, their convenience and costs of operation will have an effect on the general business of the hotel, and they should not be installed without careful study and a full understanding of the requirements.

VACUUM CLEANING OF HOTELS

BY
A. LINCOLN SCOTT

ONE of the vital cost problems in hotel operation today concerns the tremendous cost of carpet replacements. Approximately 1,500,000 yards, or $4,000,000 worth, of carpet is used each year by the hotels of this country to replace worn out material, and the average depreciation of carpets in hotels is 25 per cent per year. In view of these facts, it is obvious that the architect, in planning a new hotel, must give considerable thought to the method to be used by the hotel for purposes of carpet cleaning, as the method of cleaning and the state of cleanliness are two of the most important items regulating the length of time that a carpet will last, second only to traffic and abuse.

Inquiry among architects and engineers shows a very decided lack of authentic data on carpet-cleaning methods and, due to this fact, many hotels are designed and built without adequate cleaning systems. This mistake costs hotels of the country fabulous amounts each year, due to having to operate with inadequate equipment and by inefficient methods. A great deal of attention is given to the item of plumbing because it is recognized that it is difficult and costly, when once a building is completed, to make changes in its basic structure. This should also hold true in selecting the vacuum system to be used, as it is impractical to install a satisfactory system once the building is finished.

There are three types of equipment for vacuum-cleaning carpets,—the portable cleaner; the semi-portable cleaner or truck type machine, and the central or installed plant. By the portable type is meant the very light-weight machine in which the cleaning nozzle is attached to and is part of the machine and where the dirt passes into a bag which is fastened to the handle. This equipment is commonly used in homes, although many hotels are endeavoring to use it due to the fact that they have no other equipment. The domestic type cleaner is satisfactory when applied to service for which the machines are designed. Such light apparatus is not adequate when confronted with an eight-hour duty six days per week throughout the year. The portable machine is obviously too light for hotel service, the cost of repairs, maintenance and replacements being large, and the cleaning generally unsatisfactory when applied to hotel usage.

The semi-portable machine is the heavier type which is mounted on a truck equipped with wheels. With this type the cleaning is done by a separate tool and with varying lengths of hose. With building costs at the present-day high level, naturally the architect is interested in eliminating as much expense as possible, and it is because of this fact that a truck type machine sometimes is selected for a new hotel. When new, and kept clean, properly oiled, and up to its best possible mechanical efficiency, this machine is capable of doing fair work in hotel carpet cleaning. Difficulties arise due to the great care that the machine requires and to the fact that it is generally operated by housemen receiving about $20 per week with no knowledge of mechanics. The truck type machine is used a long way from the central power system, and, naturally, multiplying the number of machines over the house is costly and multiplies the opportunities for their neglect and consequently poor cleaning and waste of carpets. The truck type machine is thus frequently costly to maintain and operate.

Central System. The only remaining type worthy of consideration is the "central" or installed plant. This system consists of a vacuum machine together with a dirt separator or separators located in the basement of the hotel and connected to a piping system which extends throughout the building with outlets so located as to permit cleaning men to reach all parts of the building with convenient lengths of hose and cleaning tools. The cleaning principle of all systems of this type is that of an inrush of air at high velocity into the tool, which is caused by the air exhauster in the basement, creating and maintaining a sufficient vacuum throughout the piping system. The cleaning is done by passing the cleaning tool forward and backward alternately over the surface. The central system is dependent for cleaning entirely on the maintenance of a proper vacuum at the tool end at all times and in every part of the building. Therefore, no matter how good may be the machine in the basement, its cleaning efficiency will depend entirely upon the piping system being installed of proper size, and the architect should be very particular in outlining the specifications in this respect.

The advantages to the hotel operator of the architect's specifying an adequate central system are many. In the first place, all the machinery in connection with the system is installed in the basement under the expert care of the engineer in charge, and the people doing the actual cleaning do not come in contact with it at all. Secondly, all the dirt is carried automatically to the basement where it can be disposed of expeditiously without the inconvenience of hauling it from the various

Special Tools Are Needed for Various Types of Cleaning

floors. In the third place, the foul air is discharged into a flue and out of the building. This is a decided advantage, inasmuch as a room can be cleaned and left in perfect condition after vacuuming without even the necessity of opening the windows and, most important of all, is better cleaned, more quickly cleaned, and more economically cleaned. Of course, architects are confronted continually with the naturally higher cost of installation of the central system, but the extra initial expense will certainly pay for itself many times over.

Central vacuum cleaning systems are designated in sizes as one-sweeper plants, two-sweeper, etc., showing number of cleaning tools that may be operated at one time with proper cleaning efficiency. In hotels of less than 125 rooms, an architect should specify a one-sweeper capacity plant. For larger hotels, having a sweeper for each 100 rooms is generally a satisfactory rule to follow for average requirements. This rule, however, may be modified to meet the needs of unusual circumstances.

There are several central systems being marketed at the present time, so this article will outline the most important items to be considered and covered, regardless of the make of apparatus. A central system may be divided into these important parts, and it will be necessary for the architect, in establishing his specifications, to give considerable thought to each of these items:

1. Vacuum producer,
2. Motor,
3. Separator,
4. Piping system,
5. Inlet valves,
6. Hose,
7. Cleaning tools.

Vacuum Producer. In considering the vacuum producer, the best type is the self-governing type, capable of operating simultaneously the required number of sweepers, and it should be constructed with clearances of not less than ⅛ inch throughout to avoid injurious wear from dust or dirt. Apparatus operated at a speed not to exceed 1800 r.p.m. is very much preferred, particularly for large hotels, and although somewhat more expensive at first cost, it is cheaper in the long run than higher speed equipment which naturally depreciates more rapidly and causes more trouble. To avoid excessive vacuum at outlets near the machine, or where less than the full number of sweepers are in use, the vacuum at the machine must at no time exceed 7 inches of mercury. No auxiliary governing devices of any kind whatsoever should be permitted. The bearings should be of the self-oiling type and should operate under maximum loads and speed without undue heating.

The motor should be mounted on or by the vacuum producer and directly connected thereto, and, if direct current is to be used, it should be of the commutating pole type with slotted commutator, preferably General Electric, Westinghouse, or whatever the architect considers equally as good. The motor should be of ample size and

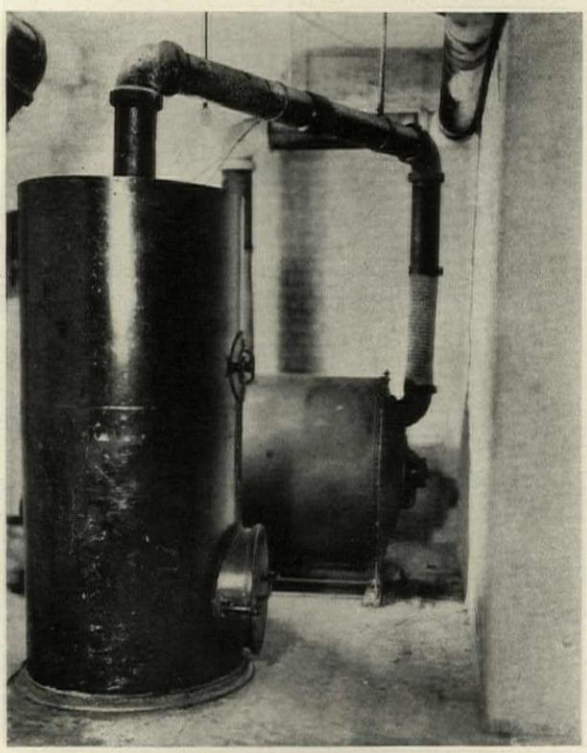
Proper Equipment Simplifies Such a Difficult Problem as Cleaning Under Beds with Minimum Effort

be capable of running at full load for two hours without undue noise or vibration.

The separator or separators should be of the dry type and constructed of steel. They should be provided on the pipe lines in the basement at or near the vacuum producer and should be capable of separating 95 per cent of the dust. No cloth bags or other appliances liable to rupture by the air currents should be permitted in the separators, and construction should be such that no part will receive the direct impact of the dust.

The piping system should be such as to operate the required number of sweepers simultaneously and should be in accordance with the standard recommendations of the manufacturer of the equipment to be furnished. The piping should be of black mild steel or wrought iron, and all fittings should be of the long-turn recessed type except where it is impossible to get them into the available space, in which case, short-turn recessed fittings should be used. Use of steam, gas or water fittings should not be permitted. In cases where the piping is below the receiver and dirt must be drawn up, long-radius pipe bends (similar to electrical conduit) should be used instead of elbows. All pipes should be smooth inside and be reamed to full inside diameter, removing all burrs, or any other projections that would catch dirt, lint, or the like, and all pipe should be screwed "home" in the fittings so as to leave a smooth, uniform bore; all ends of pipe to butt where couplings are used. Easily accessible, horizontally disposed clean-out plugs should be placed at the bottoms of all risers, and at the end of every long horizontal run. The contractors should should be compelled to leave the face of the fitting back from the finished face of the wall or floor from ¾ inch to 1 inch. Failure to do this should entail on the piping contractor any extra expense involved in making this part of the work acceptable. Approved pipe hangers should be substantially installed and should be located as near together as 10 feet. Exposed pipes, where they pass through a finished floor or wall, should be provided with nickel-plated floor or ceiling plates. Exhaust pipe should be connected to a chimney or flue without other openings above the basement. The piping contractor should provide and permanently install, at a point as nearly as possible over the center of the machine, a ring or beam clamp of sufficient strength to lift the machine to be used in setting it up in case of its needing repairs.

Drapery is Effectively Cleaned by Using a Broad Brush Tool



All Dirt Accumulates in this Tank of the Central System of the Paramount Hotel, New York

The inlet valves should be 1½ inch, so located in the building that any point can be reached with not more than 50 feet of hose, as anything above this is cumbersome and inconvenient to handle. These valves should be of the spring closing type with concealed springs of best quality and of such strength as to insure closing of the valves in any position. Valves should not project more than ¾ inch from wall or baseboard.

The hose should be in 50-foot lengths, with a length for each sweeper that the plant is designed to operate. It should be 1½-inch steel reinforced suction hose to weigh not more than 14 ounces per foot. The hose should be equipped with clincher type rubber couplings with no metal exposed on either end to mar the floors, woodwork or furniture.

The cleaning tools should be of the best materials and workmanship with renewable wearing surfaces and with slots not less than ⅝ inch in width, and should be of the swivel type, controllable by the operator by turning the handle. All floor and wall handles should be of steel tubing, chromium-plated excepted those made of aluminum, which should be polished. All tools should be positively attached to handles, and under no circumstances should use of friction tape connections be permitted. Here is a list of cleaning tools which should be furnished for each sweeper that the plant is designed to operate:—

One floor handle with inside diameter not less than 1⅛ inch, equipped with elbow joint and shut-off valve.

One wall handle in two sections not less than 1⅛ inch inside diameter.

One 5-inch hand tool for upholstery.

One 12-inch carpet renovator with not less than 7½ square inches area of slot.

One 15-inch open end bare floor tool with replaceable rubber composition, or felt sides with not less than 8 square inches slot area.

One 8-inch hand brush and library tool.

One 4-inch round brush.

One 15-inch wall brush.

I have endeavored to give, in discussing the various parts of a central plant, sufficient information to enable an architect to draw specifications suitable for all types of buildings. There is nothing contained herein that will abolish fair competition or make for excessive price.

After a survey of all of the first class hotels in New York, it was found that these houses, which are noted for their cleanliness and service, contain central installed vacuum cleaners, which come within the range of the standards herein outlined: — Paramount, Plaza, Savoy-Plaza, Sherry - Netherland, Biltmore, Commodore, McAlpin, Pennsylvania, Roosevelt, Ambassador, Ritz-Carlton.

Test. The architect, in drawing specifications for a central installed vacuum system, should insist that a test be conducted on the system, upon completion, known as the "orifice test." The vacuum producer must maintain a substantially constant vacuum under all working conditions and be capable of maintaining for each sweeper at the end of 50 feet of hose, not over 1½ inches in diameter, attached to any inlet valve in the building, a vacuum of not less than 2 inches of mercury while a round sharp-edged orifice ⅞ inch in diameter is wide open and a vacuum of not less than 3 inches of mercury while a round sharp-edged orifice ⅝ inch in diameter is open.

To determine if the apparatus meets the test described, one outlet for each sweeper that the apparatus is to operate simultaneously should be selected by the engineer making the test, to each of which should be attached 50 feet of hose of the size used with the system. In all of these hose, except one, should be placed a plate ⅛ inch thick with a ⅞-inch round, sharp-edged orifice through it. In the end of the hose where the test is to be made, there should be placed a hollow metal globe substantially 4 inches inside diameter, to the top of which should be attached a vacuum gauge and in the side of which should be a ⅞-inch round, sharp-edged orifice. The vacuum gauge under these conditions must show not less than 2 inches of mercury. A similar test should be made using ⅝-inch orifice instead of ⅞-inch orifice, under which condition the vacuum gauge must not show less than 3 inches of mercury.

Contrary to impressions prevailing in some quarters, central cleaning systems are available and may be installed in the smaller and moderate sized hotels, as well as in larger structures. In many hotels of 100 rooms or even less, one finds the same efficient equipment that is found in the high class hotels of as many or even more than 1000 rooms. A centrally installed vacuum system is of great value in cleaning marble corridors, ball rooms, etc., and is also a great help in caring for upholstered furniture, as well as mattresses and pillows. Many hotels that I have been connected with have had special rooms where the chairs, mattresses, pillows and hangings were vacuumed at regular intervals.

As an engineer and a hotel manager, it is my personal opinion that a good, reliable and properly installed vacuum system is one of the most important and necessary features of any hotel.

HOTEL LAUNDRIES

BY

CLIFFORD WAYNE SPENCER

IN allotting space and equipment to the various departments of hotels it has too often been the custom to relegate the laundry to the background and force the laundry engineers to accommodate their layouts to whatever space happens to be left over, often greatly impairing the efficient operation of the laundry service. It should be quite evident that there is hardly a detail of hotel service that can react so decisively to the advantage or disadvantage of a hotel's reputation as the supply of clean linen. Hotel laundry does not require as much washing as general laundry, since it is usually only slightly soiled. The management of the hotel, by keeping direct supervision, is able to bring about an increase in the life of linen. Added to this saving there is the fact that it has been found very profitable to do guests' work.

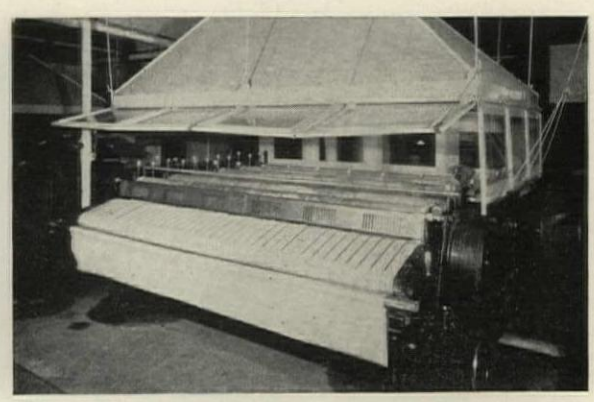
Space. The amount of space to be devoted to laundry purposes depends on the location of the hotel and the amount of service to be rendered. A hotel in a small town is not likely to have as many pieces of laundry per room as would a large city hotel, due to the facts that their dining room service is usually less; that they seldom have to provide for banquets; and that they usually do not have to provide linen for barber shops or beauty parlors. Inquiry should always be made as to just which of these departments is to be served with clean linen, and whether the personal work of guests is to be done by the hotel. The space may be estimated in a general way on the basis of so many square feet per room. Large city hotels supplying complete service launder about 30 pieces for each room and require from 7 to 10 square feet per room, while in smaller hotels about 15 or 20 pieces may be expected from each room, requiring a floor area in the laundry of from 5 to 8 square feet. In these small hotels where guest work is not done, the number of pieces from each room may only be 8 or 12, and in such cases the floor area of the laundry might be reduced to from 4 to 6 square feet for each room. A good general rule for allotting space on the basis of the number of beds is 10 square feet per bed, but this should always be governed by a careful study of the conditions in each case, to see whether they warrant a reduction in the ratio of laundry space to the number of beds. If it is possible to arrange the various machines in such a way that the wash is fed from one to the other by gravity, a great saving may be effected by eliminating the space that would otherwise be devoted to the storage and movement of a large number of trucks. In a recently completed hotel of about 2300 rooms, the laundry, which is arranged to operate by gravity, has a total of 42,500 square feet of floor space distributed in this way:

Hotel work division	17,800 sq. ft.
Guests' " "	7,250 " "
Receiving and shipping	2,600 " "
Boilers, engine, softener, tanks, etc.	5,000 " "
Storage, employes' washrooms, offices, stairways, elevators, etc..	9,850 " "

It should be pointed out, however, that this laundry is in the form of a separate unit located in an outlying district where saving of space is not so vital, and that garage space and employes' restaurant are included.

Location. The attempt to make every possible square inch of hotel space available to the entertaining of guests has usually resulted in the laundries being located in the basement, which although not ideal from the point of view of the laundry itself, is bearable providing ample ventilation and artificial lighting are secured. This also

Finishing Department for Hotel Guests' Laundry



Flat Work Ironer in a Large Hotel

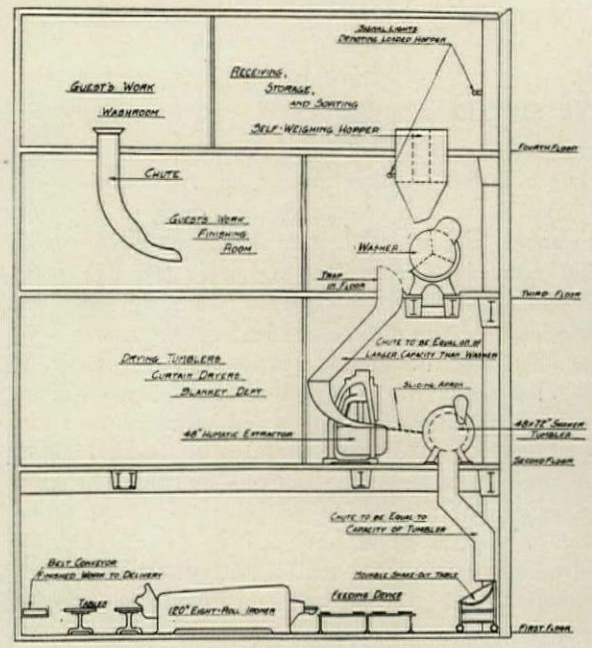


Diagram Showing Machines Arranged in Vertical Sequence

Extractors Should Be Securely Anchored to the Floor

has the advantage of placing the laundry near the power and heat of the hotel engine room. In some houses, such as the Lord Baltimore Hotel, in Baltimore, where the laundry is placed on the 18th floor, it has been thought advisable to locate the laundry near the top of the building, permitting a considerable saving in the cost of lighting and ventilating equipment. This is partly offset, however, by the additional cost of structural members to bear the heavy machinery and of risers to bring steam and hot water from the boiler room, to say nothing of the loss of space that might otherwise be available for guests' rooms. In the case of some large hotels located in districts where the value of real estate is enormous, it has been found worth while to locate the laundry in a separate building at some distance from the hotel, transporting the clean and soiled linen in huge baskets loaded on motor trucks. A good example of this is at the new Palmer House, in Chicago, where the laundry is located in a modern four-story building, some four miles from the hotel itself. Perhaps an ideal location for a hotel laundry would be in a three- or four-story wing of the hotel proper where the linen could be received and sorted at the top and pass to the various machines by means of the gravity system.

Layout. The up-to-date hotel laundry is so laid out that the soiled linen is collected from the guest rooms, sorted, washed, dried, finished and returned to the rooms with a minimum of labor, noise and confusion, the various processes taking place in direct sequence with as little crisscrossing as possible. In a hotel where the laundry is located on a lower floor, which is the usual arrangement, the linen is collected from the rooms in trucks and placed in laundry chutes which are usually constructed of metal, sometimes lined with glass, being perfectly smooth and having airtight doors at each floor. Being airtight, the fall of the soiled linen is air-cushioned, and it arrives at the sorting room without impact. The sorting room should be just above the washroom, if possible, and in close proximity to the laundry office where the lists are checked and charged. It is then delivered to the washroom and placed in the washers, whence it is passed to the extractors and thence to the tumblers, and finally to the various finishing departments. In the case of the flat work, such as sheets and pillow cases, they are put directly through the flat work ironers and delivered to the master linen room whence they are taken to linen closets on the various floors as needed. In some cases flat work is taken directly to the linen closets. Bath towels and curtains, after leaving the tumblers, go to special drying tumblers, and the curtains are then placed on stretcher dryers. The guests' personal work may pass through the same washers and extractors as the house work, but it is far more desirable to keep this class of work entirely separate if space and equipment permit. After leaving the extractors, this work is taken to the starch room or department where there is a large variety of starching equipment, collar equipment, shirt-finishing systems, prim presses and other finishing machines. Space must also be provided as near as possible to the guest work finishing department for sorting and pack-

ing, so that the work may be returned promptly to the rooms. By maintaining these guest work laundries, many hotels are able to collect work before 9 A.M. and return it the same day.

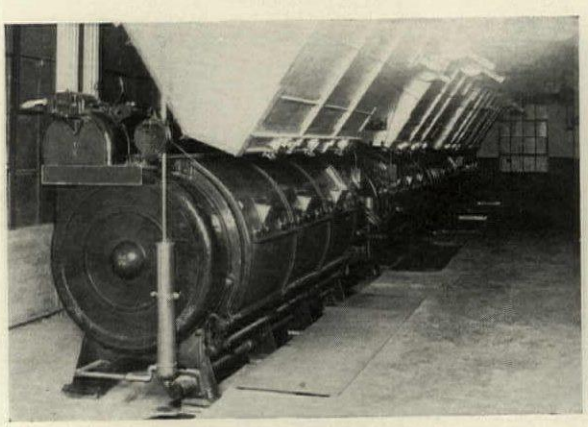
In addition to the office space, rest rooms and toilets for employes should be provided. These are often omitted, and the result is great inconvenience not only to the employes but to the hotel management as well. The boilers and general generators for the laundry may be separate or included in the general power unit of the hotel, and the water supply should be assured at all times. Usually it is impossible to pipe water directly from city lines, as the pressure is too low. In such cases, pumps and storage tanks should be supplied. It is the practice in modern laundries to heat water by using exhaust steam and by reclaiming heat from waste water. Equipment for all these purposes should be provided for. As already said, a considerable saving in space and labor can be made if it is possible to locate machinery in vertical sequence, so that the wash moves downward from one machine to another by force of gravity. If this is done, the soiled material is sorted into hoppers at the top and allowed to drop into the washers on the floor below. Then it drops through the floor to extractors and tumblers on the next floor, and from there drops to the shake-out tables whence it is fed through the ironers. By this method, practically all the manual labor is eliminated from the washing process. Space above the machines is utilized for storage, and a large number of push trucks, which require a considerable amount of space for storage and movement, are eliminated.

Special Features. Since absolute cleanliness is the most important factor in laundry work, the walls and floor should be smooth and easily washed with as few exposed pipes as possible. Gutters should be supplied in the wash room, and if the gravity system is to be used, proper floor openings should be provided. If natural light is available, it should be admitted freely through an abundance of windows and skylights, if possible, as the lighting of laundries should be unusually good in order that work may be inspected and details brought out clearly. Artificial light should also be provided, and in the case of basement laundries it should be carefully planned with due attention to these requirements:

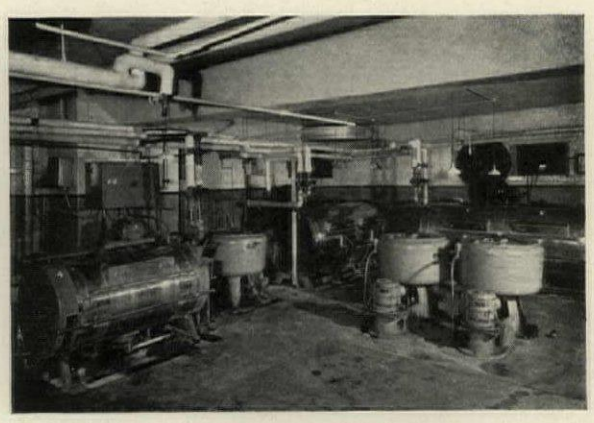
1. A steady light of sufficient intensity on all working surfaces.
2. A light of comparable intensity on adjoining areas and walls.
3. Light of color and spectral character best suited to its purpose.
4. Freedom from glare and glaring reflections.
5. Light so directed and diffused as to prevent shadows or contrasts of intensity.
6. System to be simple and economical.

For the purpose of lighting laundries mercury vapor lights are considered by some to be even more satisfactory than sunlight, since it is easier on the eyes; does not produce a glare; and exaggerates imperfections. Another important factor in the efficient operation of a laundry is good ventilation. If the laundry is on an upper floor, this is comparatively simple. When the laundry is in the basement the equipment must be more complete. In any case, the air should be warmed to the room temperature before being admitted so as not to cause fog and condensation on the walls. In addition to the general ventilation system, hoods with exhaust fans should be provided over heated machines. Where the laundry is on a lower floor, the exhaust should not be in close proximity to the guest quarters.

Unless an architect is entirely familiar with the most up-to-date types of laundry machinery he should not attempt to write specifications for this type of equipment without calling in a laundry specialist, since this type is subject to such rapid improvement that a specification good a year or two ago may a little later be entirely out of date.



Washers with Hoppers and Trap Doors for Easy Loading and Emptying



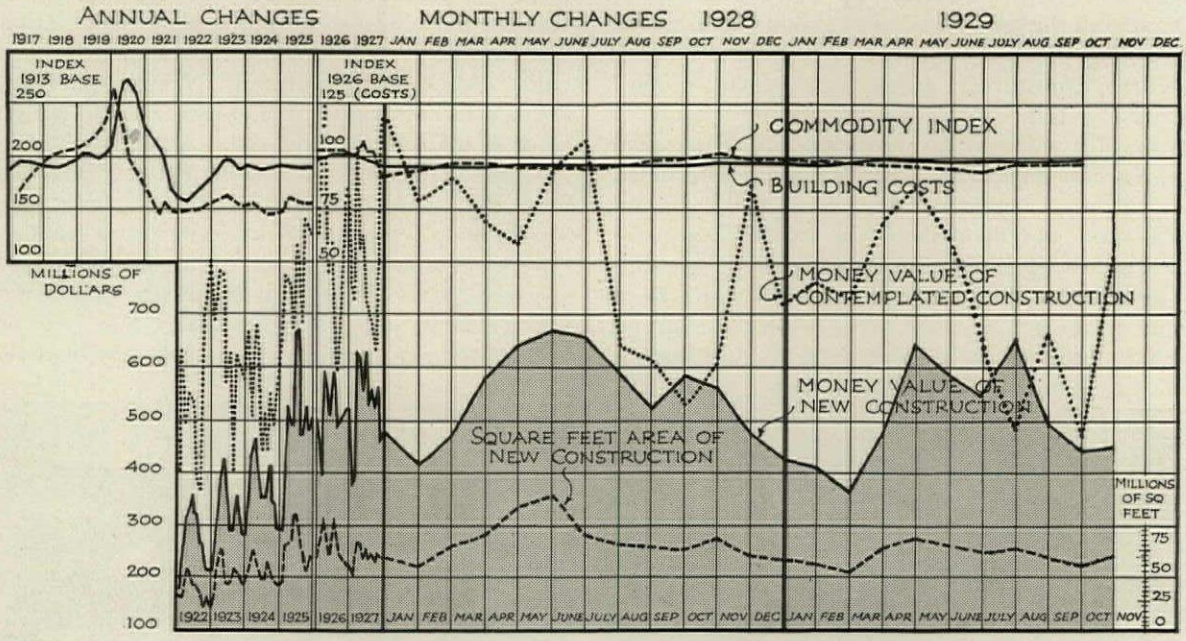
Extractors and Washers Should Be in Close Proximity for Efficient Operation

THE BUILDING SITUATION

A MONTHLY REVIEW OF COSTS AND CONDITIONS

BUILDING construction contracts awarded during the month of October amounted to $445,642,300, according to reports of the F. W. Dodge Corporation, covering the 37 states east of the Rocky Mountains. This exceeds by $240,000 the value of contracts awarded during the previous month, but is 25 per cent lower than the figure for October of last year. The total for the first ten months of 1929, amounting to $5,046,909,900 shows a falling off of 12 per cent when compared with the total for the corresponding period of 1928. The district which includes New York and northern New Jersey, with contracts valued at $101,603,100 reported during October, shows an improvement of 25 per cent when compared with September, but a great falling off, amounting to 46 per cent, when compared with October, 1928. For the first ten months of 1929 this district shows a total of $1,184,737,300, which is 23 per cent below that for the corresponding portion of 1928. The New England states, with an October total of $40,040,700 showed an improvement of 17 per cent over September, but fell off 3 per cent from October, 1928. For the first ten months of 1929, with a total of $358,288,500, New England is 18 per cent behind its figure for the same period of 1928.

The middle Atlantic states represent another district in which the October figures are ahead of September but below the total for the previous October. The October total of $51,531,500 was 6 per cent ahead of September but 34 per cent below October. For the ten months to date, this district total was $608,747,400, showing a decrease of 11 per cent when compared with the ten months of 1928. An optimistic trend seems apparent in the Pittsburgh district. The contracts awarded during the month of October amounted to $77,619,300. The contract figures reported during October do not indicate any radical changes in the trend of construction indicated by figures of previous months of this year. It is important to note, however, that October reports of work in contemplation for future months show an increase of 73 per cent over similar reports obtained during September and of 30 per cent over contemplated work reported during October of 1928. This contemplated work may not materialize in time to swell the total for 1929, but coupled with the easier money situation, it argues well for more extensive construction activity during the early part of 1930.



THESE various important factors of change in the building situation are recorded in the chart given here: (1) *Building Costs.* This includes the cost of labor and materials; the index point is a composite of all available reports in basic materials and labor costs under national averages. (2) *Commodity Index.* Index figure determined by the United States Department of Labor. (3) *Money Value of Contemplated Construction.* Values of building for which plans have been filed based on reports of the United States Chamber of Commerce, F. W. Dodge Corp. and *Engineering News-Record.* (4) *Money Value of New Construction.* Total valuation of all contracts actually let. The dollar scale is at the left of the chart in millions. (5) *Square Foot Area of New Construction.* The measured volume of new buildings. The square foot measure is at the right of the chart. The variation of distances between the value and volume lines represents a square foot cost which is determined, first by the trend of building costs, and second, by the quality of construction.

Tasting doesn't tell

Tasting the water doesn't tell anything about its corrosiveness... Waters that are purest and most healthful may be highly corrosive.

WATERS may taste and look alike but, at the same time, depending upon their sources and treatment, may vary greatly in their effects on plumbing pipe. Purity, from a health standpoint, has no relation to corrosiveness.

In writing plumbing pipe specifications, therefore, the character of the local water supply should be carefully considered. Brass Pipe will outlast rustable pipe under all conditions, but not all alloys of brass will give the same satisfactory service everywhere.

To meet different water conditions, The American Brass Company has developed two alloys of Anaconda Brass Pipe, Anaconda 85 and Anaconda 67.

Anaconda 67 Brass Pipe—Where normal water conditions prevail; that is when waters are *not* drawn from peaty sources, shallow wells, tubular wells or filter galleries in lowlands along river beds and where filtered waters are not of high permanent hardness, Anaconda 67 Brass Pipe is recommended. This pipe contains not less than 67% copper; is seamless, semi-annealed and guaranteed.

Anaconda 85 Red-Brass Pipe—For distribution lines carrying ground waters and colored surface waters, particularly when drawn from peaty sources and filtered waters which may be high in carbonic acid content and low in alkalinity, Anaconda 85 Red-Brass Pipe is offered as the best corrosion-resisting pipe commercially obtainable. This pipe, containing a minimum of 85% copper, is seamless, semi-annealed and guaranteed.

Proved by 16 years of testing

The durability of these two kinds of pipe has been proven by 16 years of exhaustive research during which many copper-zinc pipe alloys were subjected to the action of unusually corrosive water for a period of ten years. Six years' field investigation of actual installations substantiated the laboratory tests and resulted in the adoption of the alloys now known as Anaconda 67 and Anaconda 85.

Service to Architects

The Technical Department of The American Brass Company is prepared to help determine the character of local water supplies. Architects are invited to make use of this service. The American Brass Company; General Offices: Waterbury, Connecticut.

ANACONDA BRASS PIPE

FOR HOT AND COLD WATER LINES

This is the "K of K Hygienic" Seat *made by Kohler of Kohler*

HERE is the latest addition to the Kohler line. A very important addition—"K of K Hygienic" closet seats. A complete line—all models—open and closed front, with and without covers, in Sea Pearl finish or plain, harmonizing with all Kohler colors, also in white, black, mahogany, and golden oak.

With many new features to recommend it, perhaps the outstanding feature of this new line is Kohler *Quality*. "K of K Hygienic" seats are made *by* Kohler *at* Kohler, insuring the same quality standard, centralized control, fine workmanship, and rigid inspection that have built the reputation of Kohler Enameled Iron fixtures, Vitreous China, and Brass.

You may now specify Kohler closets complete with Kohler seats, crated together—thus centralizing responsibility for quality and delivery, while simplifying specification-writing, ordering, and handling "on the job."

Improved Design—New Features Kohler Quality

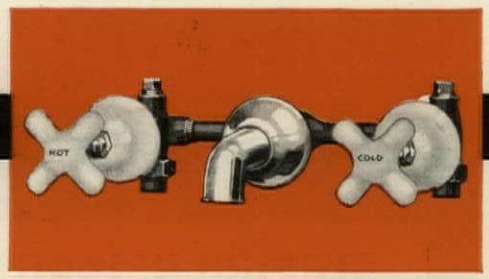
1. Cover and seat swing from one concealed bar hinge.
2. Flange on hinge checks seat and cover in upright position.
3. Two metal bars keep cover securely in place.
4. Solid hardwood core, reinforced with cross-grain dowels.
5. Durable, sanitary sheet covering.

KOHLER CO., *Founded 1873*, Kohler, Wis. · *Shipping Point*, Sheboygan, Wis. · *Branches in Principal Cities*

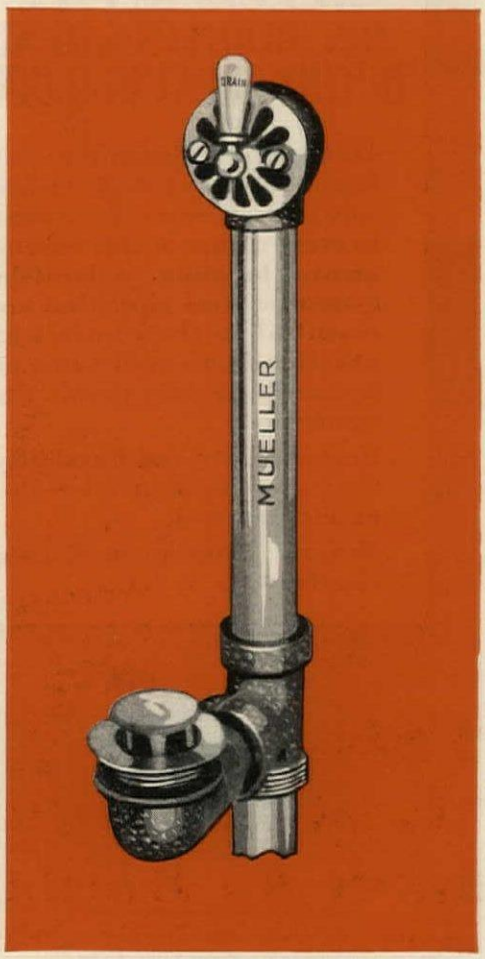
KOHLER OF KOHLER

PLUMBING FIXTURES

LOOK FOR THE KOHLER TRADE MARK ON EACH FIXTURE



Strengthen the "vital spots"!



Specify Mueller faucets and fittings

MODERN architects know that dependable water service is imperative in every building that they design. Thousands of these men have learned that the "vital spots" of a water system—faucets and fittings—can be relied upon to give year-after-year service if "MUELLER" is written into the specifications.

Mueller Faucets and Fittings are built of the finest obtainable materials by an organization which for 72 years has manufactured these products to the highest standards of quality. Rigid laboratory control and the skilled workmanship of master craftsmen are not regarded as a sufficient guaranty of Mueller Quality. As an added precaution, Mueller products are tested under conditions which are many times more severe than those encountered in actual service.

Mueller dependability may be enjoyed without sacrifice of appearance, for selections can be made from a wide variety of beautiful and richly finished Mueller designs. Ask your master plumber about Mueller Faucets and Fittings or write to us for interesting information.

MUELLER CO. (Established 1857), Decatur, Illinois. *Branches*: New York, 135th St. and Walnut Ave., Bronx; Dallas, San Francisco, Los Angeles. *Canadian Factory:* MUELLER, Limited, Sarnia.

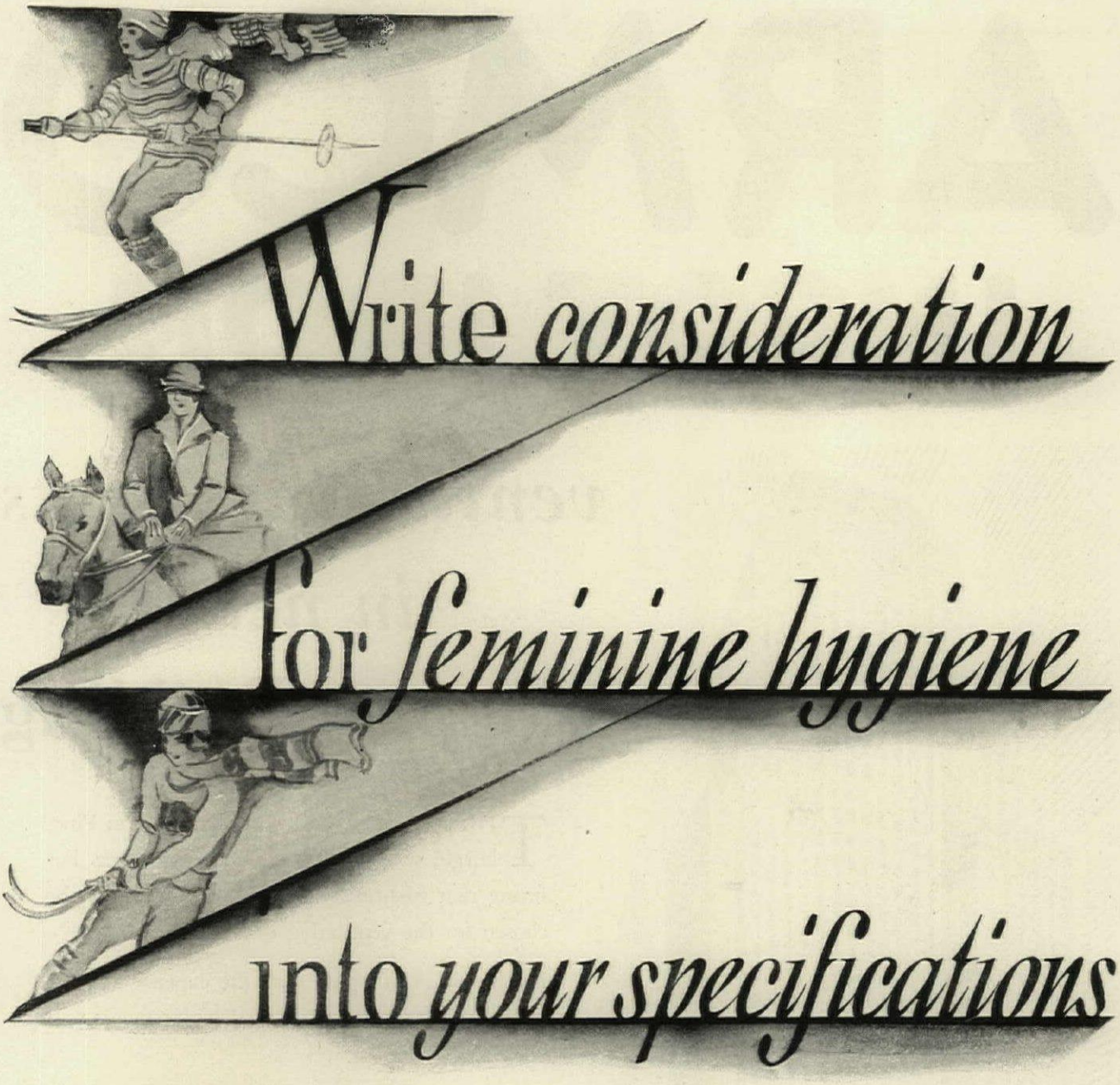
Mueller Built-In Equipment
offers important advantages in simplicity of design and easy accessibility.

Mueller G-4050
Over-Rim Tub Filler. Overhead shower may be connected.

Mueller G-5865
Pop-Up Drain. No panel necessary behind tub. All parts removable from inside of tub.

MUELLER

PLUMBING BRONZE AND VITREOUS WARE



WITHIN the last few years false modesty has given way to a new frankness regarding women's hygienic problems.

The need of the modern fastidious woman for adequate sanitation in her home or office is one which demands the serious consideration of every practicing architect.

The trapway of the average toilet is so small as to scarcely permit the passage of a golf ball. Such a toilet, when used for the disposal of sanitary pads, eventually clogs, stops up and causes repeated annoyance and embarrassment.

But there is one fine modern toilet particularly designed to meet this difficult problem. It is The Improved Madera, with large oversize trapway and powerful, yet silent, twin-jet siphonic flushing. The Madera passes sanitary pads easily and safely.

In addition to this thoroughly important feature, the Madera has a generous elongated bowl of glass-hard Durock, long and soil-proof seat with large opening, with all surfaces below the seat opening completely covered with water. Include it in your next specifications.

* * *

Thomas Maddock's Sons Pottery, Division of Standard Sanitary Manufacturing Company, Trenton, N.J.

ARMCO INGOT IRON

ventilating ducts in new

Koppers Building

THE majestic new Koppers building, in Pittsburgh, was built to endure. So it was but fitting that rust-resisting ARMCO Ingot Iron be chosen for the ventilating ducts.

By the use of this pure iron, the expense and annoyance of frequent repairs and replacements will be avoided.

ARMCO Ingot Iron was selected because of its proved durability—the *longest record of actual service* of any low-cost, rust-resisting sheet metal.

Perhaps out of our wide experience we can help you with some sheet metal problem that's confronting you now. The office nearest you will be glad to assist. Write or telephone.

ARMCO

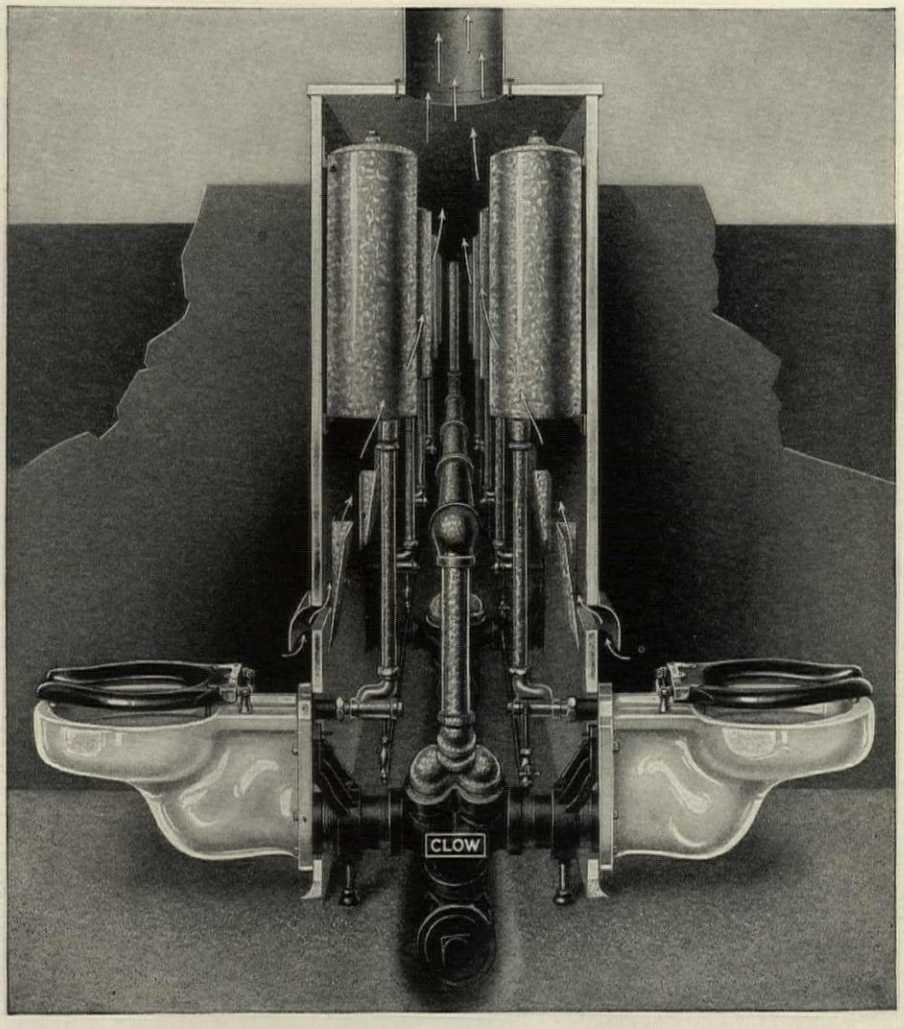
Back of this familiar symbol is nearly thirty years' experience in the manufacture of special analysis iron and steel sheets and plates. When you want a rust-resisting, low-cost metal be sure to see this triangle and the words "ARMCO Ingot Iron." It is assurance of dependable, economical service.

THE AMERICAN ROLLING MILL COMPANY

Executive Offices, Middletown, Ohio

Export: The ARMCO International Corporation

DISTRICT OFFICES: Chicago, Cincinnati, Cleveland, Detroit, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco



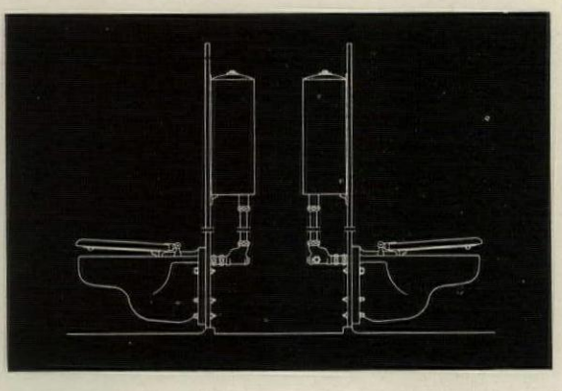
AUTOMATICALLY FRESH AND CLEAN

with Clow Madden Wallomatics . . . and Clow Patented Ventilators

Above is shown the application of the Clow Patented Closet Stall Ventilator. Through it, odors are drawn from the toilet room into the utility corridor—and carried off, at the outlet. It is so constructed that paper cannot be stuffed in to stop its action.

Automatically, closet rooms are fresh and clean.

And, independently of forgetful minds—Clow Madden Wallomatics send a powerful stream of water, cleansing the entire bowl after every use. There's nothing to touch. Nothing to remember. It's automatic.



RECORD NO. 107
26 years ago, 15 Clow Madden Automatics were installed at the May Street School, Benton Harbor, Michigan. In the past 6 years not one cent has been spent for repairs. No record was kept for previous years.

With Clow Madden Automatics, sanitation is assured for a quarter century and more—as installation records show.

For the Clow Madden Valve has only two moving parts—has no minute by-passes to cause trouble. Tests prove it uses less than half the usual amount of water, *for a surer flush.*

With Clow Patented Ventilators and Clow Madden Wallomatics, odor-free air and taint-free closets are automatically assured for the life of the building.

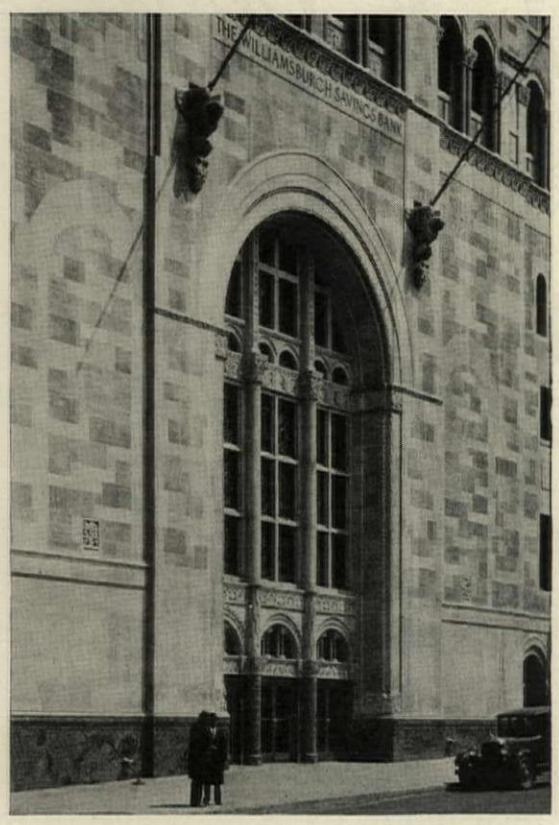
(Center Illustration)
Showing how closed top tanks are concealed in utility corridor behind back wall. Clow Wallomatics are built free of the floor for cleaner toilet rooms.

JAMES B. CLOW & SONS, 201-299 NORTH TALMAN AVE., CHICAGO

CLOW MADDEN AUTOMATIC

Forty-Eight Styles, Heights and Types to Meet Your Requirements

MEETING ARCHITECTURAL STANDARDS OF QUALITY



Entrance to Williamsburgh Savings Bank Bldg., Ashland and Hanson Places, Brooklyn, New York. HALSEY, McCORMICK & HELMER, INC., architects; ALEXANDER BRYANT CO., plumbing contractors; Solid Nickel Silver plumbing fixtures in Bank offices by MEYER-SNIFFEN CO., New York.*

WILLIAMSBURGH SAVINGS BANK
SOLID NICKEL SILVER* PLUMBING FIXTURES BY MEYER-SNIFFEN

18% Nickel SILVER

THE Williamsburgh Savings Bank is another leading financial institution that insures the beauty and permanence of plumbing fixtures by using Solid Nickel Silver. Plumbing fixtures of Solid Nickel Silver were specified for these beautiful bank offices because this type of sanitary equipment retains its lustrous, clean-looking appearance in spite of severe service. In their silver-like appearance, fixtures of Solid Nickel Silver are comparable to Pure Nickel and to alloys of high Nickel content. They are corrosion-resisting and easy to keep bright...not easily marred or broken during installation or use. In hardness, toughness and strength they are similar to tough bronze and provide unusual wear-resistance, particularly at the valve seats. For quality plumbing installations, both large and small, the highest architectural opinion agrees that there is no substitute for Solid Nickel Silver.

[*Diamond Metal is the name used by the MEYER-SNIFFEN CO. to identify its Nickel alloy used in manufacturing Nickel Silver plumbing fixtures. This is a solid white metal and contains a high percentage of Nickel.]

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

"Flush-Kleen"

SEWAGE EJECTORS

In The HOTEL

SCHROEDER HOTEL—MILWAUKEE
. . . uses Duplex "Flush-Kleen" Sewage Ejectors
Architect—Holabird & Root, Chicago
Plumbing Contractor—Wenzel & Henoch, Milwaukee

HOTELS—such as the Schroeder, in Milwaukee—are using the "Flush-Kleen" Sewage Ejector to good advantage.

Public facilities receiving most use, and abuse, must be capable and sturdy.

"Flush-Kleen" will handle anything that can pass through sanitary return lines.

No strainer baskets to be cleaned—an obnoxious job often disregarded and which indirectly is the cause of much trouble in the basket type installation.

"Flush-Kleen"

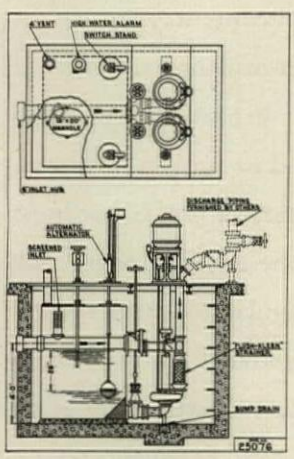


FIG. 2057—*Diagram of Duplex Dry Basin Flush-Kleen Sewage Ejectors.*

has been developed by "Chicago Pump" engineers who have had over 20 years' experience in pump design, and is recommended and guaranteed for hotel use.

Without the slightest hesitancy, engineers who have had "Flush-Kleen" experience, run most any kind of waste into their ejector pits.

"Flush-Kleen" employs the flow reversal principle—just like backwashing a filter.

Layouts, engineering data, specifications on several types of "Flush-Kleen" Ejectors to meet various conditions are available to you in Bulletin No. 125.

. . . will handle

1—Returns from basement toilets.

2—Refuse from kitchens.

3—Drainage from laundries, barber shops, etc.

4—Seepage and sub-drainage.

5—Anything that enters the basin . . . you cannot clog a "Flush-Kleen."

. . . features

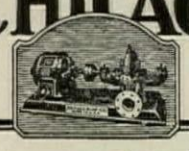
a—No strainer baskets to be cleaned.

b—No sewage touches the impellers—they cannot bind or clog.

c—Basins do not become foul and unsanitary.

d—Operation of pumps alternated by the "Automatic Alternator."

CHICAGO PUMP COMPANY



SEWAGE-CONDENSATION-CIRCULATING
BILGE-FIRE-HOUSE-VACUUM

General Offices and Plant—2336 Wolfram St., Chicago
New York Office—79 Madison Ave. *Detroit Office*—General Motors Bldg.

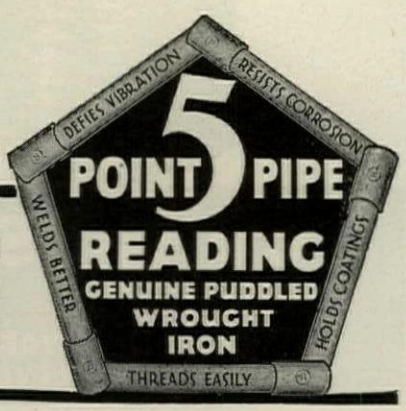
PUT Reading Genuine Puddled Wrought Iron Pipe into your buildings. As far as you are concerned, the wrench that tightens the joints is the last wrench they need ever know. For far beyond the span of human life, these sturdy pipes will resist corrosion, strain, and vibration. But if the building be torn down, other wrenches may take these pipes apart only to reinstall them elsewhere!

Be sure you get pipe with the Reading name, date of manufacture, and cut-in spiral knurl mark on it.

READING IRON COMPANY, Reading, Pennsylvania

Atlanta · Baltimore · Cleveland · New York · Philadelphia
Boston · Cincinnati · St. Louis · Chicago · New Orleans
Buffalo · Houston · Tulsa · Seattle · San Francisco
Detroit · Pittsburgh · Ft. Worth · Los Angeles · Kansas City

GENUINE PUDDLED WROUGHT IRON
READING PIPE
DIAMETERS RANGING FROM 1/8 TO 20 INCHES



MUNICIPAL AUDITORIUM, NEW ORLEANS, LA.
Favrot & Livaudais, New Orleans, Architects. Equipped with DOUGLAS Plumbing Fixtures trimmed with Solid Nickel Silver.
A. G. Rose, Inc., New Orleans, Plumbers.

DOUGLAS Solid Nickel Silver self-closing faucet with drop ear indexed handles.

Again . . .
The Architect's Choice

DOUGLAS
PLUMBING FIXTURES
trimmed with Solid Nickel Silver

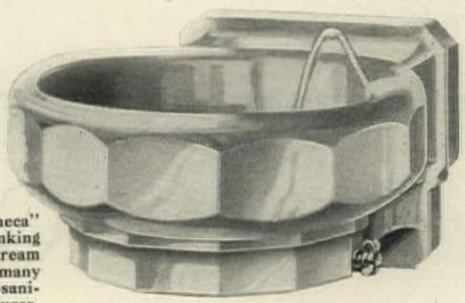
Consistent with their well-established policy of carefully selecting materials and workmanship, Favrot & Livaudais, Architects, of New Orleans, specified DOUGLAS Plumbing Fixtures equipped with Solid Nickel Silver Fittings for the handsome new Municipal Auditorium at New Orleans.

Fittings of this type are recognized to meet the highest architectural standards of quality. Long usage has proven their ability to remain everlastingly beautiful.

In comparing Solid Nickel Silver with plated fittings, they should be considered in the same light as when comparing any other solid metal with plated ware.

SOLID 18% 22 Nickel SILVER

Solid Nickel Silver is nickel color through and through. It's rich lustre is equalled only by the mellow beauty of fine old silver. There is no plating to wear off or chip — it never rusts—resists corrosion—easily cleaned — as hard as bronze. Due to its toughness, valve seats are highly wear resistant.



DOUGLAS "Seneca" vitreous china drinking fountain with side stream —one of the many DOUGLAS super-sanitary plumbing fixtures.

The JOHN DOUGLAS COMPANY, Cincinnati, Ohio

Manufacturers of High-grade Plumbing Fixtures Since 1887

MARKS *that* CERTIFY

CRODON

TRADE MARK REG. U. S. PAT. OFF.

The mark that assures the Architect of *Quality* in CHROMIUM PLATE!

An open letter...
short and to the point!

Gentlemen:

Chromium Plating has progressed since its youth. The science—and Chromium Plating is a science—now reaches its highest perfection in CRODON. This word identifies Chromium Plate with which is associated neither "ifs" nor "buts". CRODON is simply a mark that assures Architects of *quality* in Chromium Plate... and to specify CRODON is simply to specify the products of the most noteworthy manufacturers.

May we send you a complete list of CRODON licensees?

Earnestly yours,
United Chromium, Inc.

CRODON

TRADE MARK REG. U. S. PAT. OFF.

THE CHROME PLATE

CHROMIUM CORPORATION OF AMERICA

Branch Offices and Plants: Chicago, Cleveland, and Waterbury, Conn.

Licensees of

UNITED CHROMIUM
INCORPORATED

Executive Offices: 51 East 42nd Street, New York City

HOTELS STATLER AND NIEDECKEN

PENNSYLVANIA
New York

STATLER
Boston

STATLER
Buffalo

STATLER
Cleveland

7,000 NIEDECKEN MIXER SHOWERS

First Installations, Cleveland, 700 Showers in 1912. Latest Installations, Hotel Pennsylvania, 1,500 showers —Now Being Completed.

The same reasons which prompted Mr. Statler to decide upon Niedecken Mixer Showers should be considered by you in the final selection of shower bath equipment.

STATLER
Detroit

SEND FOR BLUE PRINT PLANS

Interesting lay-outs of how to utilize present space to install showers in hotel rooms without taking away room space. For hotel remodeling, and the more modern shower bath equipment for hotels, so much desired now. Write for these blue print suggestions now.

THE LARGEST HOTEL INSTALLATION IN THE WORLD

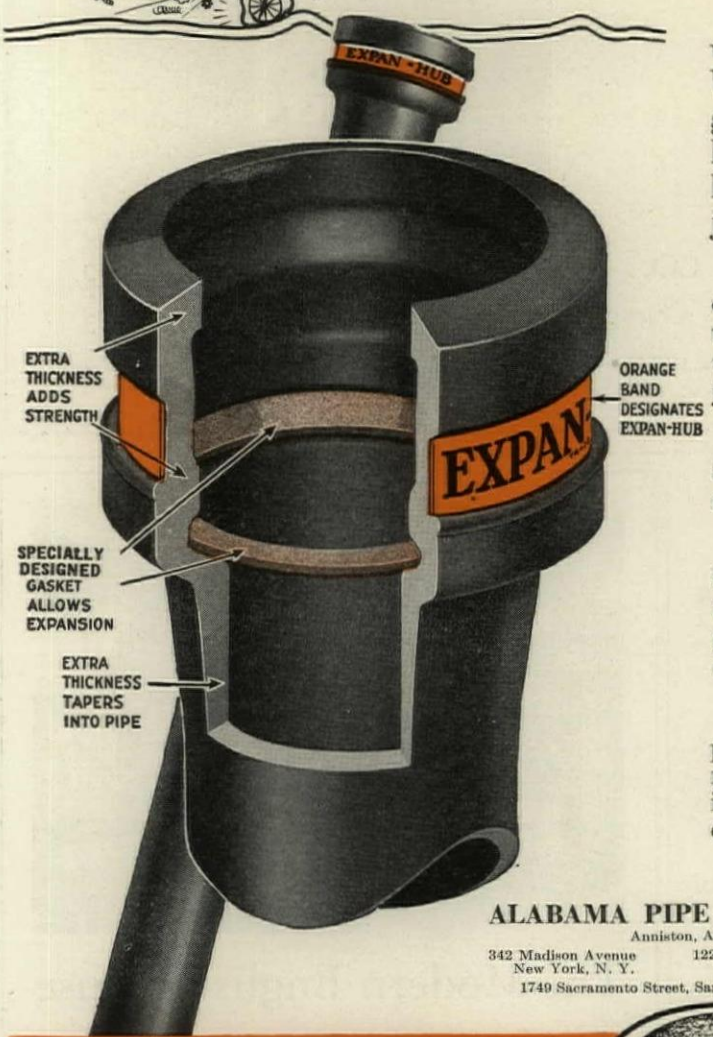
The many patented advantages in Niedecken Showers — practical, easy-clean, removable shower head; water economy spray; water saving temperature control mixer; positive leak-proof shower stall—and other advantages will convince you that NIEDECKEN Showers are superior to all others, as they convinced Mr. Statler. Write for details now.

HOFFMANN & BILLINGS MFG. CO.
MANUFACTURERS SINCE 1855
MILWAUKEE, U. S. A.

DESCRIPTIVE LITERATURE ON REQUEST

Write now for detail descriptive, illustrated literature about Niedecken Showers; Shower Head construction and easy-clean method; Mixer and Water Control details; Shower Stall leak proof designs, etc. Sent in full, gladly upon request.

The GREATEST IMPROVEMENT in 50 Years



Imagine concrete highways laid without provision for expansion. What a "roller coaster" ride they would give autoists: The same problem must be met in the soil, waste and vent lines of buildings or buckling and leaky joints are bound to occur.

A specially designed gasket in the hub of each length of EXPAN-HUB SOIL PIPE takes care of expansion and settlement—preventing buckling of the stack and keeping joints gas-tight, ***permanently.***

Contractors, Engineers and Architects say this one feature is the **greatest advance in soil pipe in 50 years.**

On top of that the design of EXPAN-HUB is a distinct improvement. For the extra thickness at the hub, which tapers off into the pipe, **allows caulking joints without fear of splitting hubs.**

Here, at last, is a soil pipe that's different. A pipe that every owner will immediately recognize as a distinct improvement. Most plumbing jobbers carry it in stock, or can get it quickly.

MANUFACTURED AND SOLD BY

ALABAMA PIPE COMPANY
Anniston, Ala.
342 Madison Avenue, New York, N. Y.
122 So. Michigan Avenue, Chicago, Ill.
1749 Sacramento Street, San Francisco, Calif.

STRINGER BROS. CO., Inc.
Gadsden, Ala.
1100 W. 38th Street, Chicago, Ill.
128 Sidney Street, Cambridge, Mass.

EXPAN-HUB SOIL PIPE

LOOK FOR THE ORANGE BAND

The New Yorker Hotel, New York City, *Sugarman & Berger Architects*

SUPERLATIVE

New York glories in the possession of so many "biggest" and "finest" that it is natural that the 43 story *New Yorker* Hotel (2,500 rooms), Sugarman and Berger, Architects, should be the *tallest* hotel building in the world.

Like so many other outstanding structures in the Metropolis, the Service Departments of the New Yorker are equipped with Alberene Stone Toilet Partitions and Shower Compartments.

Since Alberene Stone is fabricated and erected without any exposed metal it is exceptionally well adapted for use in sub-basements where moisture may be present to cause rust and deterioration. Stone flush against stone, held with tongue-and-groove joints, leave no crevices for vermin to breed, and so great is the structural strength that no metal clips or supports are needed.

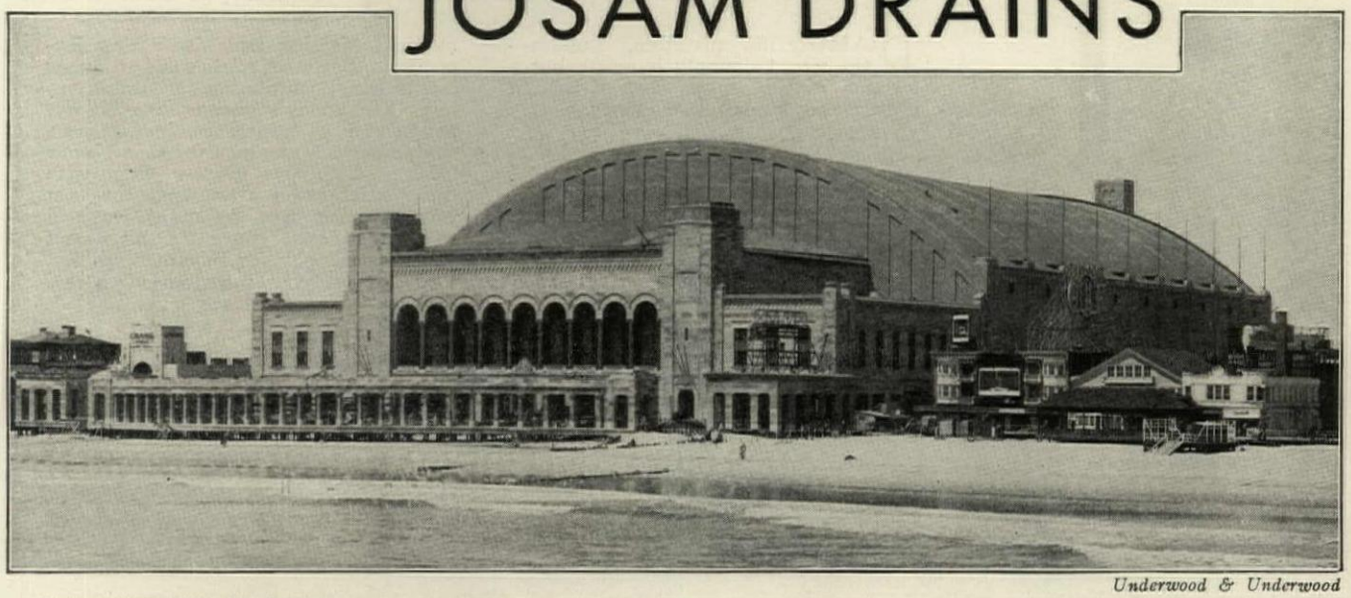
Architects and builders are invited to send for informative literature, and to avail themselves of the aid of our Architects Service Department in planning sanitary installations which will be proof against deterioration and depreciation.

ALBERENE STONE COMPANY
153 West 23rd Street, New York

Branches: Chicago Philadelphia Boston Newark Pittsburgh Cleveland Richmond Washington, D. C. Rochester
Quarries and Mills at Schuyler, Va.

ALBERENE STONE
TOILET PARTITIONS

ADDING VERSATILITY TO THE LARGEST BUILDING OF ITS KIND IN THE WORLD WITH JOSAM DRAINS



Underwood & Underwood

Lockwood-Greene & Co., Inc., Engineers
Boston, Mass.
Cook & Blount, Associate Architects
New York, N. Y.
M. B. Markland Co., General Contractors
Atlantic City, N. J.

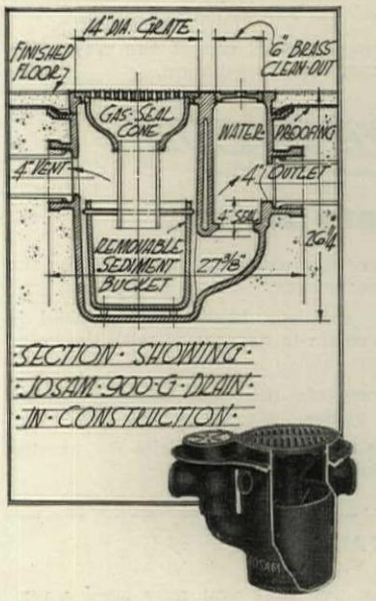
ONE day a circus — the next a plumbers' convention. One day a prize fight — the next a flower show. The Atlantic City Convention Hall adds the art of versatility—rapid-fire, overnight changing—to its mammoth size.

But versatility can never be accomplished without having the drains geared up to take care of all cleaning and waste water and condensation from pipes—without placing drains not only at the usual places but at every point in the building to guard against seepage and inadequate draining. Furthermore, Josam Drains play a very important part in saving the beauty of the building and protecting it forever against the depreciating effects of deterioration.

Josam Drains are installed throughout—in the roof, floors, ramps, areaways, entrances, boiler room, lavatories.

Josam Drains are protecting thousands of notable structures. Josam engineers, working together with architects, are finding new uses for Josam Drains. Architects are specifying Josam Drains not only at the obvious places but at every vital point where an extra measure of protection must be added.

The Josam Catalog "G" which recommends hundreds of uses for Josam Drains and other Josam Products will be sent gladly upon request.



The Josam Manufacturing Co., 4907 Euclid Bldg., Cleveland, Ohio
Factory: Michigan City, Indiana *Branches in Principal Cities*

SEE OUR CATALOGUE IN SWEETS

Josam PRODUCTS TRADE MARK REG.

Josam Products are sold by all Plumbing and Heating Supply Jobbers.

The Josam Line Includes:

Josam Drains for Floors, Roofs, Showers, Urinals, Garages and Hospitals; Josam Swimming Pool Equipment; Josam-Marsh Grease, Plaster, Dental and Surgical, Sediment and Hair Interceptors; Josam-Graver Floor-Fed, Gas-Fired Garbage and Rubbish Incinerators; Josam Open Seat Back Water Sewer Valves; Josam Open Seat Swing Check Valves; Josam Adjustable Water and Gas-Tight Closet Outlet Connections and Bends.

There Are No Substitutes for Josam Products

The costliest thing on earth?

DIAMONDS, platinum, radium—the world's supply is worth but a fraction of the annual cost of human illness and human inefficiency.

Industry's heaviest toll is the loss produced by lost workers, lost time, lost productivity due to lack of adequate heating, ventilating, air-conditioning in homes and work places.

What is Industry doing about it? If you want to know, come to Philadelphia January 27 to 31. Visit the International Heating and Ventilating Exposition. See what science has produced for heating, ventilating, air-conditioning. See today's means, machinery, materials, apparatus, instruments, equipment. Examine them at your leisure. Compare—discuss them with the specialists in attendance for that very purpose. See the many ways in which you can reduce the high cost you yourself pay for human disability. You can cut your contribution to this expense. Come and see how.

International Heating & Ventilating Exposition

Under the Auspices American Society Heating & Ventilating Engineers

International HEATING & VENTILATING EXPOSITION Commercial Museum PHILADELPHIA

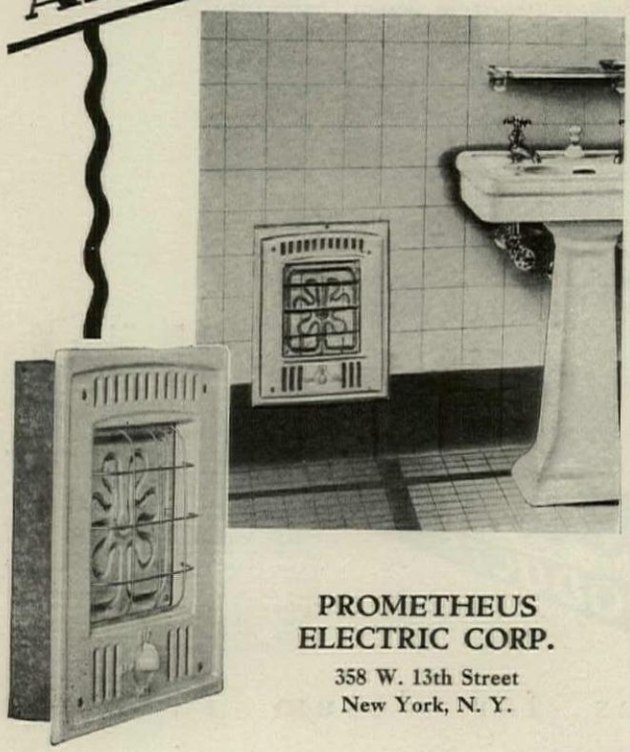
COMMERCIAL MUSEUM, PHILADELPHIA

January 27 to 31, 1930

Management International Exposition Company, largest industrial exposition organization in the world.

3716

An Auxiliary Electric Heater a Necessity



In the Spring and Fall, before and after the boiler is fired—and before the heat comes up in the morning or after the fire is banked—those are the times the Prometheus Electric Heater is welcomed in the bathroom. That's when the thoughtfulness of the architect who specified the Prometheus is praised.

The Prometheus is built into the wall, out of the way. The three-heat switch permits easy heat regulation.

PROMETHEUS

Bathroom Heater

is not a fire hazard. Prometheus Heaters are approved by the National Board of Fire Underwriters.

This attractive grilled-front cast-iron heater is furnished in various colors of vitreous porcelain to harmonize with the color scheme of the room.

The Monel guard which protects the heat element cannot crack or chip like porcelain grilles.

Backed by twenty-five years of experience. Write for catalog or mail the convenient coupon.

PROMETHEUS ELECTRIC CORP.
358 W. 13th Street
New York, N. Y.

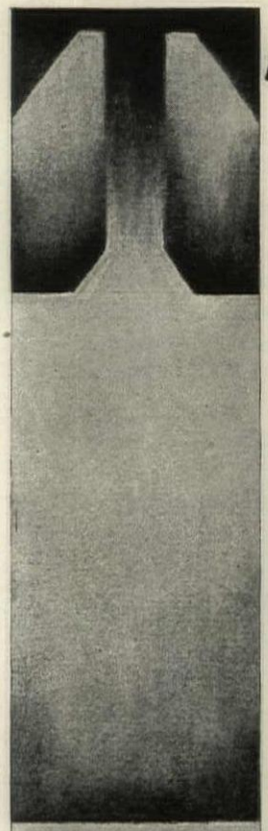
PROMETHEUS ELECTRIC CORP.,
358 W. 13th Street, New York.

Without any obligation on our part you may send your catalog on built-in heaters.

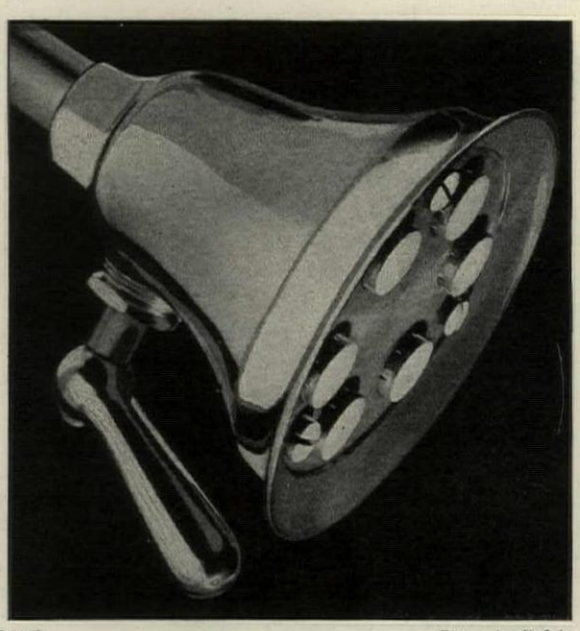
Name .....

Address .....

Town ..... State.....



The fame of this revolutionary shower head extends throughout the architectural profession



K-3395 Patent Applied for

NOT just "a new shower head" but one so radically improved as to demand serious consideration for every type of installation.

Its superiorities are many:

Turns of the convenient lever make this improved Speakman Self-Cleaning Anystream Shower Head adjustable, giving any sort of spray the user wants. A coarse, sluicing, single stream . . . . a pleasant, normal spray . . . . a stinging, invigorating needle shower. The bather finds a variety of sprays to suit every purpose, from a refreshing, tonic bath to a single stream for shampooing the hair.

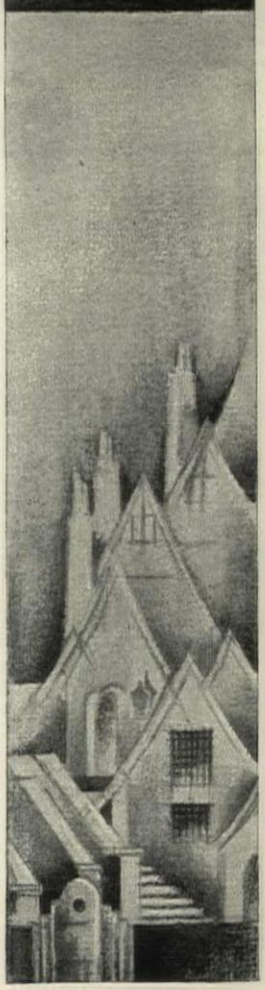
One turn of the lever flushes this head free from dirt or clogging scale. Never any bother of taking apart to clean. The streams always issue from water openings that are clean as a newly-washed dish.

Finished in Speakman chromium plate and finely made in every detail, this new shower head is a worthy representative of unfailing Speakman quality. Speakman Company, Wilmington, Del.

A turn of the lever sluices all sediment away.

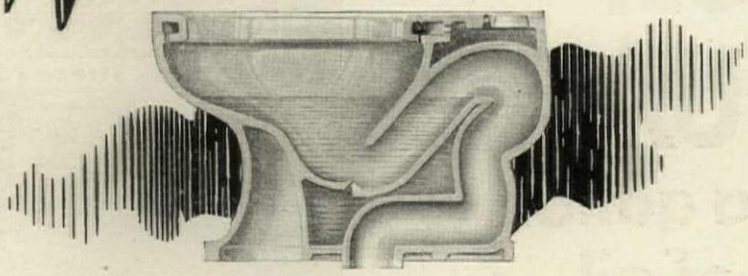
Another turn of the lever gives a normal spray.

Or you can adjust to a veritable stinging needle shower.



SPEAKMAN *Showers & Fixtures*

New—The Exwite Welling

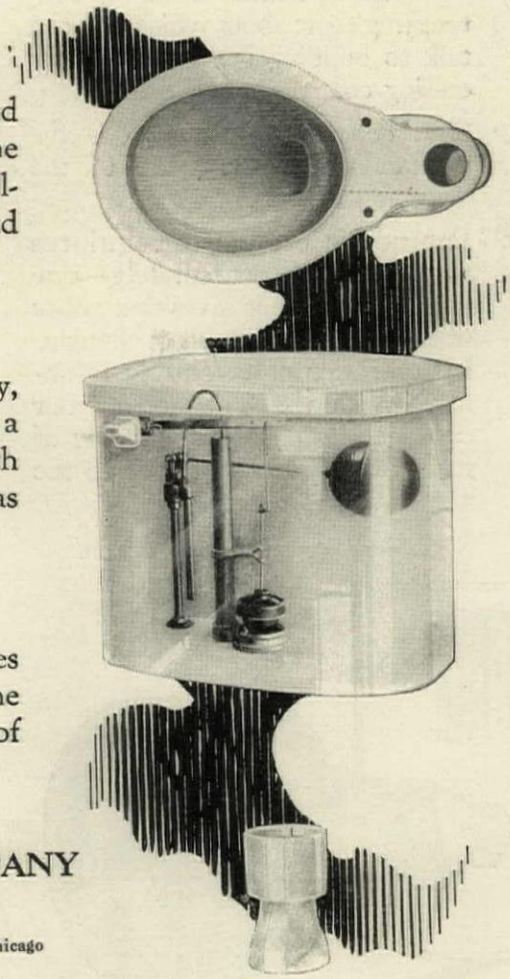


1 Unless a water closet is completely successful in flushing, it quickly becomes a source of trouble. An outstanding feature of the Exwite Welling is its oversize outlet passage, insuring the passing of objects which clog most closets.

2 Then the water surface; extra large and covering entire surface of bowl. With the strong, positive action of the Exwite Welling, the purchaser is assured a clean and presentable bowl after every flush.

3 No better tank fittings are made. Very, very few combinations have assembled a combination of fittings to compare with them. They are as near trouble-proof as such things can be.

4 Then the China Connection. It removes the last trace of metal and, with the fine all-white seat, completes the picture of whiteness and cleanliness.



THE TRENTON POTTERIES COMPANY

TRENTON, NEW JERSEY, U. S. A.

National Showroom, New York City
101 Park Ave., Entrance on 41st St.

Branch Offices
Boston, Philadelphia, Chicago

Export Office, 115 Broad St., New York City

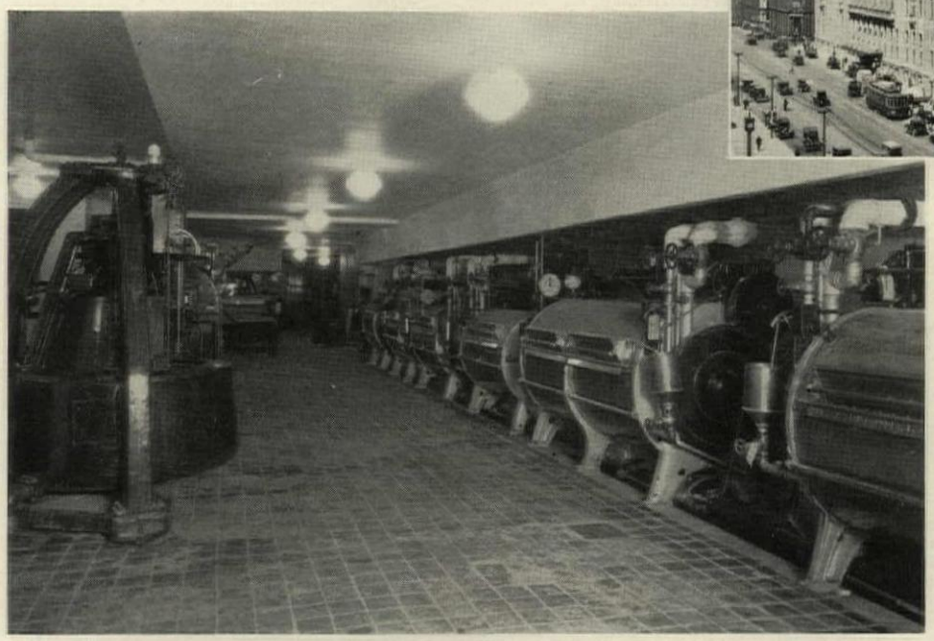
TRENTON

THE TRENTON POTTERIES COMPANY

Our Guarantee: We make but one grade of ware—the best that can be produced—and sell it at reasonable prices. We sell no seconds or culls. Our ware is guaranteed to be equal in quality and durability to any sanitary ware made in the world. The Te-pe-co trade mark is found on all goods manufactured by us and is your guarantee that you have received that for which you have paid.

[No. 63 of a series of advertisements featuring prominent laundry installations]

A Canadian hotel, its *indispensable* laundry



The Royal York Hotel, Toronto, Ontario, Canada, owned and operated by the Canadian Pacific Railway Company, with a view of the monel metal Cascade Washers and Humatic Extractors in its indispensable laundry. This airy, well-lighted department was designed in collaboration with the engineers of The Canadian Laundry Machinery Company. Ross & Macdonald, Architects; Anglin-Norcross, General Contractors.

...and a helpful service for you

THE Royal York Hotel, Toronto, has an enormous tonnage of soiled linens, fifty-two weeks every year. And how the laundry problem was solved so satisfactorily for this great Canadian hostelry is an interesting story—a story of architectural and laundry-engineering cooperation.

Architects frequently have occasion to counsel with The American Laundry Machinery Company in working out unusual laundry problems. If you are planning an institutional laundry of any type—in hotel, hospital, office or apartment building—"American" engineers can give you some helpful suggestions. Their services are at your disposal, any time.

THIS MAN can give you suggestions about floor-space dimensions, power requirements, washroom troughings, lighting and ventilation—show you floor plans of scores of institutional laundries he has helped to plan and install.

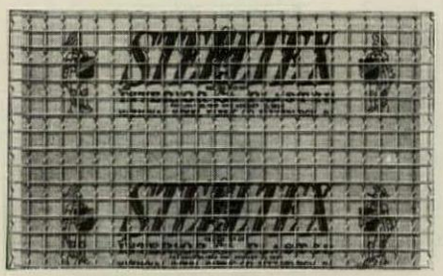
THE AMERICAN LAUNDRY MACHINERY COMPANY, *Norwood Station,* CINCINNATI, OHIO

The Canadian Laundry Machinery Co., Ltd., 47-93 Sterling Road, Toronto 3, Ont., Canada
Agents: British-American Laundry Machinery Co., Ltd., Underhill St., Camden Town, London, N.W.1, England.

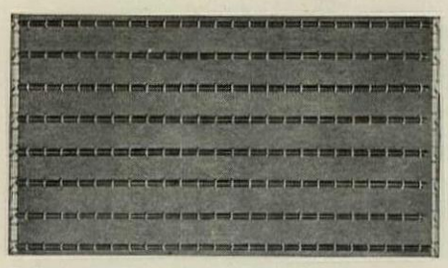
Your clients want permanent wall-beauty . . . insure it economically by *Ribbed STEELTEX*

37,000 sq. yds. of the NEW RIBBED STEELTEX safeguard walls and ceilings in this outstandingly beautiful modern apartment building, The Grenfell, now under construction at Kew Gardens, L. I., N. Y. Economy of construction, adaptability, and tenant satisfaction, no upkeep costs—influenced the Gormac Construction Corp., Brooklyn, N. Y., owners and builders, to build with reinforced plaster.

Wherever strength is most needed, as in plaster surfaces adjacent to exterior walls, RIBBED STEELTEX is used in The Chateau, Woodmere, L. I.—a striking new development in the New York metropolitan area. Reinforced plaster, which STEELTEX alone can provide, has stood the test of over a quarter of a million installations in all parts of the country.



Front view of the NEW RIBBED STEELTEX, showing reinforcing fabric and absorptive backing.



Back view of the NEW RIBBED STEELTEX, showing new V-shaped metal stiffening rib and heavier backing.

NOW RIBBED STEELTEX brings to walls and ceilings the strength of steel reinforcing and the economy of single-cost construction.

STEELTEX is not only outstandingly successful on the largest apartment jobs, where costs are checked to the last cent. It is no less economical on the most modest home. It adds nothing to the cost of the finished wall, yet provides the permanence of reinforced plaster, strengthened by rustproofed steel. The picture above shows Tudor Apartments, nearing completion at Rockville Center, Long Island, architect, Joseph Unger, Flushing, N. Y.; owners and builders, Ansid Realty Inc., Rockville Center, L. I., N. Y.

10 advantages of the New *Ribbed* Steeltex

1. New V-rib stiffener produces level lathing job of board-like rigidity.
2. Furring device assures embedment of reinforcing fabric.
3. Slab of uniform thickness assured—smooth in back as well as front.
4. All plaster functions in slab—no waste in keys or hangovers.
5. Plaster applies easily and stays put when applied.
6. New-type absorptive backing assures proper curing.
7. Nails up fast as any lath.
8. New-size sheets — 28½" x 50" — make this a one-man lath.
9. Easily cut with tin snips—easily shaped for angles.
10. Requires no change in customary operations, either lathing or plastering.

It alone makes plaster a permanent, one-cost building material, because RIBBED STEELTEX alone builds *reinforced plaster.*

What is reinforced plaster? It is plaster strengthened with embedded STEELTEX. Protecting against strains in all directions is a network of rustproofed steel. Attached to the steel is a tough absorptive fibrous backing.

When plaster is spread over RIBBED STEELTEX, it slides under the steel network, smooths out against the backing, and then additional plaster is spread over the steel. The resulting slab is uniformly thick, and continuously reinforced by a network of completely embedded steel.

The new V-rib metal stiffeners that truss each sheet of RIBBED STEELTEX assure a correct lathing job. Plaster applies easily. The new-type, absorptive backing, to which the plaster clings tight, assures proper curing. And it provides the added factor of insulation — also sound-deadening.

National Steel Fabric Company

DIVISION OF
Pittsburgh Steel Co.

3612 Union Trust Bldg. Pittsburgh, Pa.

the New *Ribbed* STEELTEX

"BUILDS LIFETIME WALLS AND CEILINGS"

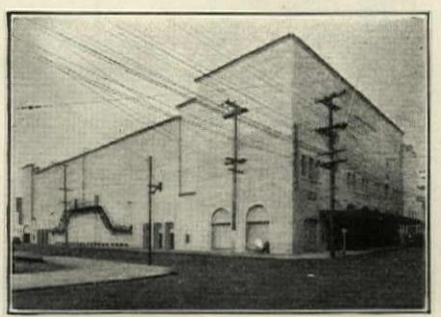
When you use *STEELTEX* for Floors you combine strength, approved construction methods, and outstanding economy

STEELTEX FOR FLOORS was introduced to the architectural and engineering professions less than two years ago. Today it is the accepted concrete floor method for all light steel joist construction.

Its widespread use in apartments, hotels, churches, schools, theatres, hospitals, and office buildings from coast to coast, proves the economy and adaptability of this modern floor material, which is a combined steel reinforcing and concrete form.

These STEELTEX results, a few of which are pictured on this page, tell their own story. We would like to send you complete details about STEELTEX FOR FLOORS. Please write us for them.

This is the most modern of stables—polo stables at the Dayton Country Club, Dayton, Ohio, architect, H. Lorenz. The backing of STEELTEX FOR FLOORS is of sufficient strength to afford safe walking surface, once the fabric has been attached to the joists.



STEELTEX FOR FLOORS is designed for any type of metal beam or truss. Rolls are quickly set in place and attached to the joists in continuous strips from one side of the building to the other. Illustration shows the Dreamland Auditorium, San Francisco, Cal., Ward and Blohme, architects.

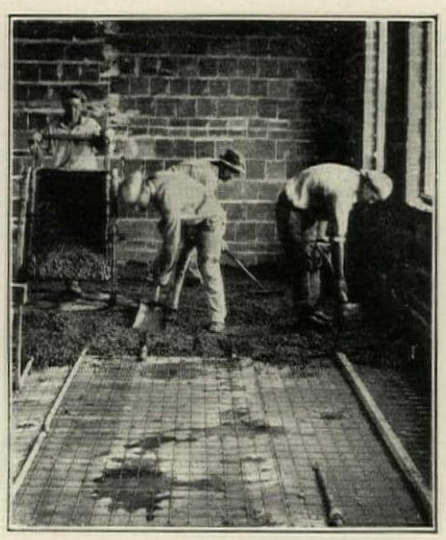
80,000 sq. ft. of STEELTEX FOR FLOORS strengthen and protect this attractive apartment building, 4011 Delmar Blvd., St. Louis, Mo. STEELTEX acts as a combined reinforcing and concrete form—saving time, labor, material, and money.

Other products of the National Steel Fabric Company

Ribbed Steeltex for Plaster, Steeltex for Stucco, Steeltex for Brick and Stone Facing, Steeltex for Floors and Roofs (concrete or gypsum)—same principle, same protection. National Reinforcing for all other types of concrete construction — buildings, roads, streets, sidewalks, dams, canals, concrete pipe, cement gun work. Made by the world's largest manufacturers of welded steel fabric.

10 advantages of Steeltex for Floors

1. Eliminates wood or metal forms.
2. Steel properly embedded automatically—full strength developed as true reinforcing.
3. Time and labor saved—quickly cut from roll and easily attached, to any type beam.
4. Saves concrete. Minimizes droppings.
5. Water-cement ratio maintained—assuring full strength of concrete.
6. Proper curing assured.
7. Eliminates clean-up expense.
8. Sound deadening factor especially desirable in hotels, schools, hospitals, and apartments.
9. Permanence of reinforcing guaranteed by heavily galvanized mesh.
10. Temperature stresses resisted and reinforcing correctly spaced, without necessity of inspection or special handling to cover these points.



The backing of STEELTEX FOR FLOORS assures proper water-cement ratio during curing, automatic embedment of the reinforcing wires without any labor for blocking up, or for pouring slab in two operations, and a minimum of clean-up trouble and expense.

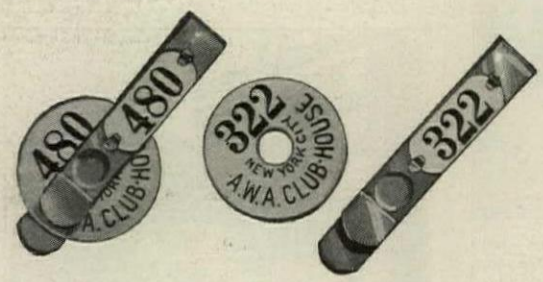
"The logical floor method"

STEELTEX

FOR FLOORS AND ROOFS

DE SAUSSURE EQUIPMENT *for the* CHECK ROOM

Make your Specifications from this Complete Line of all-Steel Unit Fixtures



De Saussure Duplicate Checking Systems

All De Saussure check-racks are made to operate with this duplicate checking system—fast and fool-proof. The fibre disc is given to the patron while the metal clip, numbered to correspond, is attached to the garment. With this system, garments may be piled on counter during rush periods, to be hung away when the pressure eases up. Service is faster, and the metal clip positively prevents mistakes.

Where a hotel or institution operates more than one check-room, fibre discs are supplied in a variety of colors—a distinct color for each check-room. This system prevents errors and enables employees to direct guests to proper check-room at a glance.

ENDLESS annoyance and alteration expense is caused to hotel and club managements through old-fashioned or home-made checking facilities.

Now De Saussure all-steel check-rack units enable the architect to specify complete checking systems based on the probable guest traffic.

De Saussure hat and coat racks are made in three styles—floor-type and wall-type racks for permanent installation, and portable racks to provide temporary or emergency checking facilities. A combination of these three types yields maximum checking capacity with minimum floor space.

Racks are all-steel, electrically welded throughout. This feature eliminates breakage expense, keeps check-room permanently neat and orderly looking, and assures perfect care of garments.

Portable racks are assembled without nuts or bolts. Can be quickly set-up or knocked down by one man without use of tools. When knocked down, portable racks store in two square feet of floor space. Supplied with either "Perfect" rubber tire castors or iron floor-gripping pyramids—instantly interchangeable.

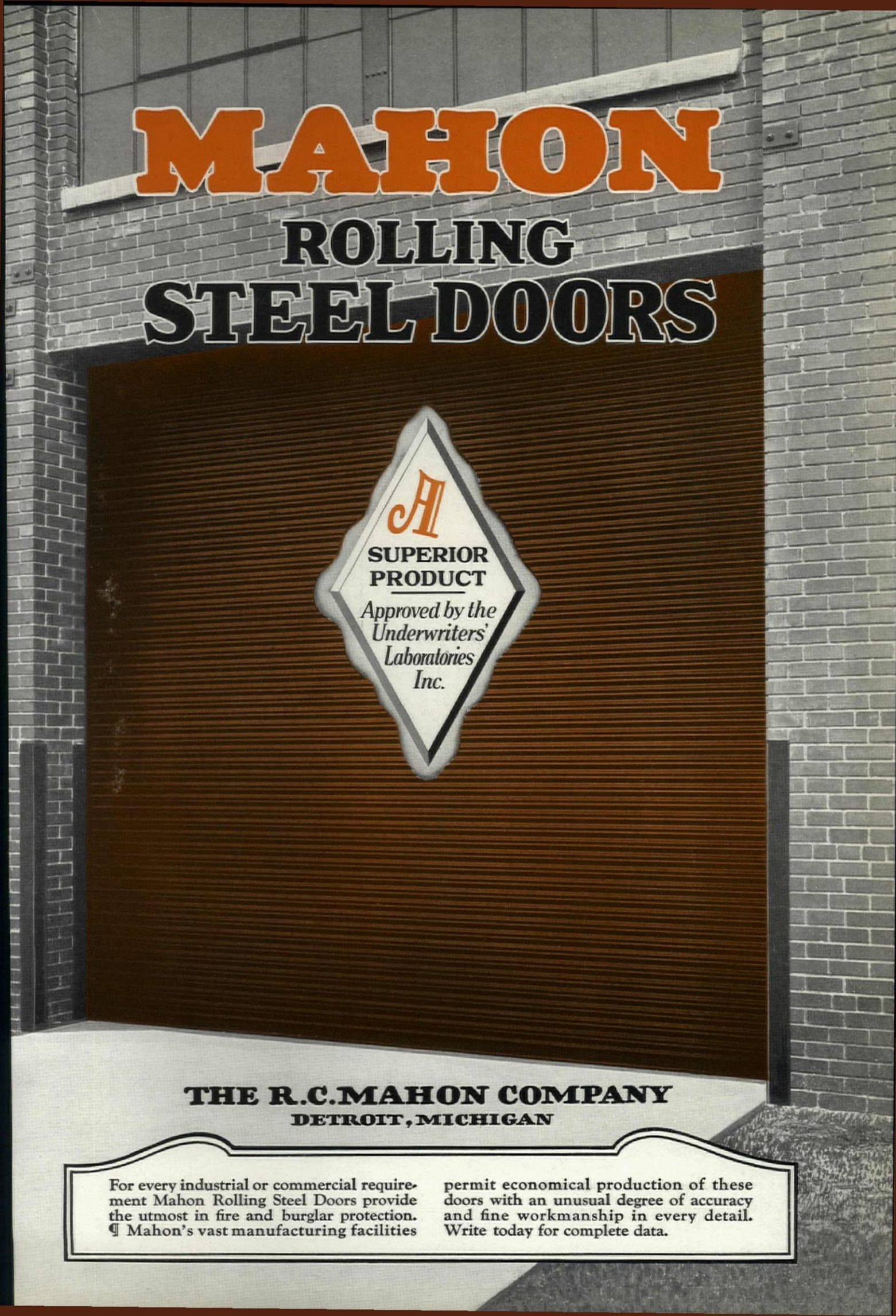
We have prepared for your reference files a circular describing De Saussure check-room equipment in detail. Write to:

WWW Wilcox MFG. CO.

Fair Prices
Prompt Shipment

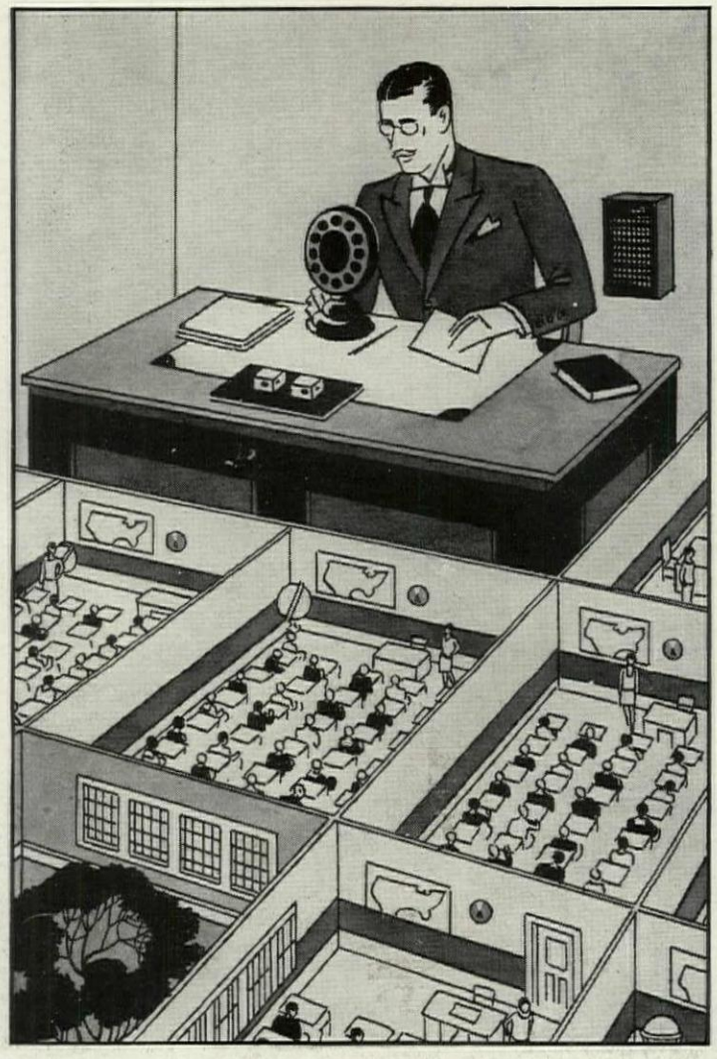
562 W. Randolph St.
Chicago, Ill.

Exclusive National Distributors of DE SAUSSURE Hotel Administrative Equipment—CHECKING SYSTEMS, ROOM INFORMATION RACKS, MAIL *and* KEY RACKS, *etc.*



THE R.C.MAHON COMPANY
DETROIT, MICHIGAN

For every industrial or commercial requirement Mahon Rolling Steel Doors provide the utmost in fire and burglar protection. ¶ Mahon's vast manufacturing facilities permit economical production of these doors with an unusual degree of accuracy and fine workmanship in every detail. Write today for complete data.



AS IF ALL ROOMS WERE ONE

The same voice—the same music—can now be heard in *every room of a building at once,* if desired. No matter how big the building . . . One room—or a thousand rooms or more—it's all the same to the Western Electric Public Address System.

In this, more and more progressive architects recognize a real *opportunity*—an opportunity to serve their clients in a new and far-reaching manner.

This sound distribution equipment has become an important accessory of the *modern* public structure. In the civic installation it renders a public service. In the commercial building—hotels, clubs, amusement places—it leads to greater profits, by providing better entertainment. Wherever applied, its uses are endless in number.

It can pick up radio—or it may be speech—entertainment—supplied directly by microphone. Or it may be accurately rendered music from the Western Electric Music Reproducer . . . For full information, consult Sweet's Catalogue. Or send for interesting booklet to the distributor, Graybar Electric Co., Graybar Building, New York, N. Y. Offices in 72 principal cities.

The last word in municipal buildings—one that can talk! *—and make itself heard.*

For hotels—paging by loudspeaker. And a hundred other uses—all important.

An auxiliary fire-alarm in schools. Line of march can be switched. Other uses, too.

On with the dance! An especially popular application for clubs, hotels, restaurants, etc.

One way to wire up a hospital for happiness. Healing by music has a real value.

It hooks up with radio. Brings into a building everything that's on the air.

Western Electric

PUBLIC ADDRESS AND MUSIC REPRODUCTION SYSTEMS

Distributed by Graybar Electric Company

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 St., Boston.
Akoustolith Plaster. Brochure, 6 pp., 8½ x 11 ins. Important data on a valuable material.

Johns-Manville Corporation, New York.
Sound-Absorbing Treatment in Banks and Offices. Booklet, 18 pp., 8½ x 11 ins. Illustrated.
Sound-Absorbing Treatment in Churches and Religious Institutions. Brochure. 22 pp., 8½ x 11 ins. Illustrated.

U. S. Gypsum Co., 205 W. Monroe St., Chicago, Ill.
A Scientific Solution of an Old Architectural Problem. Folder, 6 pp., 8½ x 11 ins. Describes Sabinite Acoustical Plaster.

ASH HOISTS

Gillis & Geoghegan, Inc., 544 West Broadway, New York.
G & G Telescopic Hoist catalog, 8½ x 11 A. I. A. Standard Classification 30il, contains complete descriptions, method of selecting correct model to fit the building's needs, scaled drawings showing space requirements and specifications.

ASH HOISTS—TELESCOPIC

Gillis & Geoghegan, Inc., 544 West Broadway, New York.
G & G Telescopic Hoist catalog, 8½ x 11 A. I. A. Standard Classification 30il, contains complete descriptions, method of selecting correct model to fit the building's needs, scaled drawings showing space requirements and specifications.

BRICK

American Face Brick Association, 1751 Peoples Life Building, Chicago, Ill.
Brickwork in Italy. 298 pp., size 7½ x 10½ ins., an attractive and useful volume on the history and use of brick in Italy from ancient to modern times, profusely illustrated with 69 line drawings, 300 half-tones, and 20 colored plates, with a map of modern and XII century Italy. Bound in linen. Price now $3.00, postpaid (formerly $6.00). Half Morocco, $7.00.
Industrial Buildings and Housing. Bound Volume, 112 pp., 8½ x 11 ins. Profusely illustrated. Deals with the planning of factories and employes' housing in detail. Suggestions are given for interior arrangements, including restaurants and rest rooms. Price now $1.00 postpaid (formerly $2.00).

Hanley Company, Bradford, Pa.
General Catalog. 16 pp. 8½ x 11 ins. Illustrated.
Bradford Reds. Folder. 8 pp., 3 x 8 ins. Illustrated.

CABINET WORK

Henry Klein & Co., 25 Grand Street, Elmhurst, L. I., N. Y.
Driwood Period Mouldings in Ornamented Wood. Brochure, 28 pp., 8½ x 11 ins. Illustrated.
Ensemble Offices for the Banker and Broker. Folder. 4 pp., 8½ x 11 ins. Illustrated.
Luxurious Office Partitions in Walnut, Mahogany and Quartered Oak. Folder. 4 pp., 8½ x 11 ins. Illustrated.

CEMENT

Carney Company, The, Mankato, Minn.
A Remarkable Combination of Quality and Economy. Booklet, 20 pp., 8½ x 11 ins. Illustrated. Important data on valuable material.

Kosmos Portland Cement Company, Louisville, Ky.
Kosmortar for Enduring Masonry. Folder, 6 pp., 3½ x 6½ ins. Data on strength and working qualities of Kosmortar.
Kosmortar, the Mortar for Cold Weather. Folder, 4 pp., 3⅝ x 6⅛ ins. Tells why Kosmortar should be used in cold weather.

Louisville Cement Co., 315 Guthrie St., Louisville, Ky.
BRIXMENT for Perfect Mortar. Self-filing handbook, 8⅜ x 11 ins. 16 pp. Illustrated. Contains complete technical description of BRIXMENT for brick, tile and stone masonry, specifications, data and tests.

Portland Cement Association, Chicago, Ill.
Concrete Masonry Construction. Booklet, 48 pp., 8½ x 11 ins. Illustrated. Deals with various forms of construction.
Town and Country Houses of Concrete Masonry. Booklet, 20 pp., 8½ x 11 ins. Illustrated.
Facts About Concrete Building Tile. Brochure, 16 pp., 8½ x 11 ins. Illustrated.
The Key to Firesafe Homes. Booklet, 20 pp., 8½ x 11 ins. Illustrated.
Design and Control of Concrete Mixers. Brochure, 32 pp., 8½ x 11 ins. Illustrated.
Portland Cement Stucco. Booklet, 64 pp., 8½ x 11 ins. Illustrated.

CEMENT—Continued

Concrete in Architecture. Bound Volume, 60 pp., 8½ x 11 ins. Illustrated. An excellent work, giving views of exteriors and interiors.

CHURCH EQUIPMENT

John Van Range Co., Cincinnati.
Practical Planning for Church Food Service. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

CONCRETE BUILDING MATERIALS

Concrete Steel Company, 42 Broadway, New York.
Modern Concrete Reinforcement. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

Kosmos Portland Cement Company, Louisville, Ky.
High Early Strength Concrete, Using Standard Kosmos Portland Cement. Folder, 1 page, 8½ x 11 ins. Complete data on securing high strength concrete in short time.

CONCRETE COLORINGS

The Master Builders Co., 7016 Euclid Ave., Cleveland.
Color Mix, Colored Hardened Concrete Floors (integral). Brochure, 16 pp., 8½ x 11 ins. Illustrated. Data on coloring for floors.
Dychrome. Concrete Surface Hardener in Colors. Folder, 4 pp., 8 x 11 ins. Illustrated. Data on a new treatment.

CONSTRUCTION, FIREPROOF

Master Builders Co., Cleveland, Ohio.
Color Mix. Booklet, 18 pp., 8½ x 11 ins. Illustrated. Valuable data on concrete hardener, waterproofer and dustproofer in permanent colors.

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
Standard Fire Proofing Bulletin 171. 8½ x 11 ins., 32 pp. Illustrated. A treatise on fireproof floor construction.

North Western Expanded Metal Co., 1234 Old Colony Building, Chicago, Ill.
North Western Expanded Metal Products. Booklet, 8½ x 10¾ ins. 16 pp. Fully illustrated, and describes different products of this company, such as Kno-burn metal lath, 20th Century Corrugated, Plaster-Sava and Longspan lath channels, etc.
A. I. A. Sample Book. Bound volume, 8½ x 11 ins., contains actual samples of several materials and complete data regarding their use.

CONSTRUCTION, STONE AND TERRA COTTA

Cowing Pressure Relieving Joint Company, 100 North Wells St., Chicago, Ill.
Pressure Relieving Joint for Buildings of Stone, Terra Cotta or Marble. Booklet, 16 pp., 8½ x 11 ins. Illustrated. Deals with preventing cracks, spalls and breaks.

DAMPPROOFING

The Master Builders Co., 7016 Euclid Ave., Cleveland.
Waterproofing and Dampproofing Specification Manual. Booklet, 18 pp., 8½ x 11 ins. Deals with methods and materials used.
Waterproofing and Dampproofing. File. 36 pp. Complete descriptions and detailed specifications for materials used in building and concrete.

Minwax Company, Inc., 11 West 42nd St., New York.
Complete Index of all Minwax Products. Folder, 6 pp., 8½ x 11 ins. Illustrated. Complete description and detailed specifications.

Sonneborn Sons, Inc., L., 116 Fifth Ave., New York.
Specification Sheet, 8½ x 11 ins. Descriptions and specifications of compounds for dampproofing interior and exterior surfaces.

Toch Brothers, New York, Chicago, Los Angeles.
Handbook of R. I. W. Protective Products. Booklet, 40 pp., 4½ x 7½ ins.

DOORS

David Lupton's Sons Company, Philadelphia.
Lupton Commercial Steel Doors. Folder. 8½ x 11 ins. Illustrated.
Lupton Steel Industrial Doors. Brochure. 8 pp., 8½ x 11 ins. Illustrated. Details and specifications.

DOORS AND TRIM, METAL

The American Brass Company, Waterbury, Conn.
Anaconda Architectural Bronze Extruded Shapes. Brochure, 180 pp., 8½ x 11 ins., illustrating and describing more than 2,000 standard bronze shapes of cornices, jamb casings, mouldings, etc.

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.

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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 185*

DOORS AND TRIM, METAL—Continued

The Kawneer Company, Niles, Michigan.
Detail sheet, 8½ x 11 ins., with A.I.A. File No. featuring Heavy Welded Bronze Doors.

Richards-Wilcox Mfg. Co., Aurora, Ill.
Fire-Doors and Hardware. Booklet, 8½ x 11 ins., 64 pp. Illustrated. Describes entire line of tin-clad and corrugated fire doors, complete with automatic closers, track hangers and all the latest equipment—all approved and labeled by Underwriters' Laboratories.

Truscon Steel Company, Youngstown, Ohio.
Copper Alloy Steel Doors. Catalog 110. Booklet, 48 pp., 8½ x 11 ins. Illustrated.

DOORS, SOUNDPROOF

Irving Hamlin, Evanston, Ill.
The Evanston Soundproof Door. Folder, 8 pp., 8½ x 11 ins. Illustrated. Deals with a valuable type of door.

DRAINAGE FITTINGS

Josam Mfg. Co., Michigan City, Ind.
Josam Products. Booklet, 73 pp., 8½ x 11 ins. Illustrated. A valuable line of accessories.
Josam-Marsh Grease, Plaster, Sediment and Hair Interceptors. Brochure. 7 pp., 8½ x 11 ins. Illustrated.
Josam New Saw Tooth-Roof Drain. Folder, 4 pp., 8½ x 11 ins. Illustrated.

DUMBWAITERS

Sedgwick Machine Works, 151 West 15th St., New York, N. Y.
Catalog and Service Sheets. Standard specifications, plans and prices for various types, etc. 4¼ x 8¼ ins., 60 pp. Illustrated.
Catalog and pamphlets, 8½ x 11 ins. Illustrated. Valuable data on dumbwaiters.

ELECTRICAL EQUIPMENT

Bryant Electric Company, Bridgeport, Conn.
HooKeX Plug and Receptacle. Folder, 6 pp., 3½ x 6¼ ins. Illustrated.
KeNeX Plug and Receptacle. Folder, 6 pp., 3½ x 6¼ ins. Illustrated.
Three-wire Polarized Caps and Receptacles. Leaflet, 8½ x 10 ins. Illustrated.
Three-wire Polarized Caps and Receptacles for Heavy Duty. Leaflet, 8½ x 10 ins. Illustrated.

General Electric Co., Merchandise Dept., Bridgeport, Conn.
Wiring System Specification Data for Apartment Houses and Apartment Hotels. Booklet, 20 pp., 8 x 10 ins. Illustrated.
Electrical Specification Data for Architects. Brochure, 36 pp., 8 x 10½ ins. Illustrated. Data regarding G. E. wiring materials and their use.
The House of a Hundred Comforts. Booklet, 40 pp., 8 x 10½ ins. Illustrated. Dwells on importance of adequate wiring.

Harvey Hubbell, Inc., Bridgeport, Conn.
Electrical Specialties. Catalog No. 19. 52 pp., 8½ x 10 ins. Illustrated.

Pick-Barth Company, Inc., Albert, 1200 West 35th St., Chicago, and Cooper Square, New York.
School Cafeterias. Booklet, 6 x 9 ins. Illustrated. The design and equipment of school cafeterias with photographs of installation and plans for standardized outfits.

Prometheus Electric Corporation, 360 West 13th St., New York.
Electric Heating Specialties. Booklet, 24 pages. 8½ x 11 ins. Illustrated. Specialties for heating, cooking, hospitals, organ lofts, etc.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Electric Power for Buildings. Brochure, 14 pp., 8½ x 11 ins. Illustrated. A publication important to architects and engineers.
Variable-Voltage Central Systems as Applied to Electric Elevators. Booklet, 12 pp., 8½ x 11 ins. Illustrated. Deals with an important detail of elevator mechanism.
Modern Electrical Equipment for Buildings. Booklet, 8½ x 11 ins. Illustrated. Lists many useful appliances.
Electrical Equipment for Heating and Ventilating Systems. Booklet, 24 pp., 8½ x 11 ins. Illustrated. This is "Motor Application Circular 7379."
Westinghouse Panelboards. Catalog 224. Booklet, 64 pp., 8½ x 11 ins. Illustrated.
Beauty; Power; Silence; Westinghouse Fans. (Dealer Catalog 45.) Brochure, 16 pp., 8½ x 11 ins. Illustrated. Valuable information on fans and their uses.
Electric Range Book for Architects (A. I. A. Standard Classification 31 G-4). Booklet, 24 pp., 8½ x 11 ins. Illustrated. Cooking apparatus for buildings of various types.
Westinghouse Commercial Cooking Equipment (Catalog 280). Booklet, 32 pp., 8½ x 11 ins. Illustrated. Equipment for cooking on a large scale.
Electric Appliances (Catalog 44-A). 32 pp., 8½ x 11 ins. Deals with accessories for home use.

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 controllers 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.
Escalators. Booklet, 8½ x 11 ins., 22 pp. Illustrated. Describes use of escalators in subways, department stores, theaters and industrial buildings. Also includes elevators and dock elevators.

Richards-Wilcox Mfg. Co., Aurora, Ill.
Elevators. Booklet, 8½ x 11 ins., 24 pp. Illustrated. Describes complete line of "Ideal" elevator door hardware and checking devices, also automatic safety devices.

Sedgwick Machine Works, 151 West 15th St., New York, N. Y.
Catalog and descriptive pamphlets, 4¼ x 8¼ ins., 70 pp. Illustrated. Descriptive pamphlets on hand power freight elevators, sidewalk elevators, automobile elevators, etc.
Catalog and pamphlets, 8½ x 11 ins. Illustrated. Important data on different types of elevators.

ESCALATORS

Otis Elevator Company, 260 Eleventh Ave., New York, N. Y.
Escalators. Booklet, 32 pp., 8½ x 11 ins. Illustrated. A valuable work on an important item of equipment.

FIREPLACE CONSTRUCTION

H. W. Covert Company, 243 East 44th Street, New York, N. Y.
Covert Fireplace Construction. Booklet, 12 pp., 8½ x 11 ins. Illustrated. Valuable data on an important topic.

FIREPROOFING

Concrete Engineering Co., Omaha, Neb.
Handbook of Fireproof Construction. Booklet, 54 pp., 8½ x 11 ins. Valuable work on methods of fireproofing.

Concrete Steel Company, 42 Broadway, New York.
Economical Fireproof Floors for Suburban Buildings. Folder. 4 pp., 8½ x 11 ins. Illustrated.

North Western Expanded Metal Co., 407 South Dearborn Street, Chicago, Ill.
A. I. A. Sample Book. Bound volume, 8½ x 11 ins. Contains actual samples of several materials and complete data regarding their use.

FLOOR HARDENERS (CHEMICAL)

Master Builders Co., Cleveland, Ohio.
Concrete Floor Treatment. File, 50 pp. Data on securing hardened dustproof concrete.
Concrete Floor Treatments—Specification Manual. Booklet, 24 pp., 8½ x 11 ins. Illustrated. Valuable work on an important subject.

Minwax Company, 11 West 42nd Street, New York, N. Y.
Concrete Floor Treatments. Folder, 4 pp., 8½ x 11 ins. Illustrated.

Sonneborn Sons, Inc., L., 116 Fifth Ave., New York, N. Y.
Lapidolith, the liquid chemical hardener. Complete sets of specifications for every building type in which concrete floors are used, with descriptions and results of tests.

Toch Brothers, New York, Chicago, Los Angeles.
Handbook of R.I.W. Protective Products. Booklet, 40 pp., 4½ x 7½ ins.

FLOORS—STRUCTURAL

Concrete Steel Company, 42 Broadway, New York.
Structural Economies for Concrete Floors and Roofs. Brochure, 32 pp., 8½ x 11 ins. Illustrated.

Truscon Steel Co., Youngstown, Ohio.
Truscon Floretyle Construction. Booklet, 8½ x 11 ins., 16 pp. Illustrations of actual jobs under construction. Lists of properties and information on proper construction. Proper method of handling and tables of safe loads.

Structural Gypsum Corporation, Linden, N. J.
Gypsteel Pre-cast Fireproof Floors. Booklet, 36 pp., 8½ x 11 ins. Illustrated. Data on flooring.

FLOORING

Armstrong Cork Co. (Linoleum Division), Lancaster, Pa.
Armstrong's Linoleum Floors. Catalog, 8½ x 11 ins., 44 pp. Color plates. A technical treatise on linoleum, including table of gauges and weights and specifications for installing linoleum floors. Newly revised, February, 1929.
Armstrong's Linoleum Pattern Book, 1929. Catalog, 9 x 12 ins., 44 pp. Color plates. Reproduction in color of all patterns of linoleum and cork carpet in the Armstrong line.
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.
Enduring Floors of Good Taste. Booklet, 6 x 9 ins., 48 pp. Illustrated in color. Explains use of linoleum for offices, stores, etc., with reproductions in color of suitable patterns, also specifications and instructions for laying.

REQUEST FOR CATALOGS

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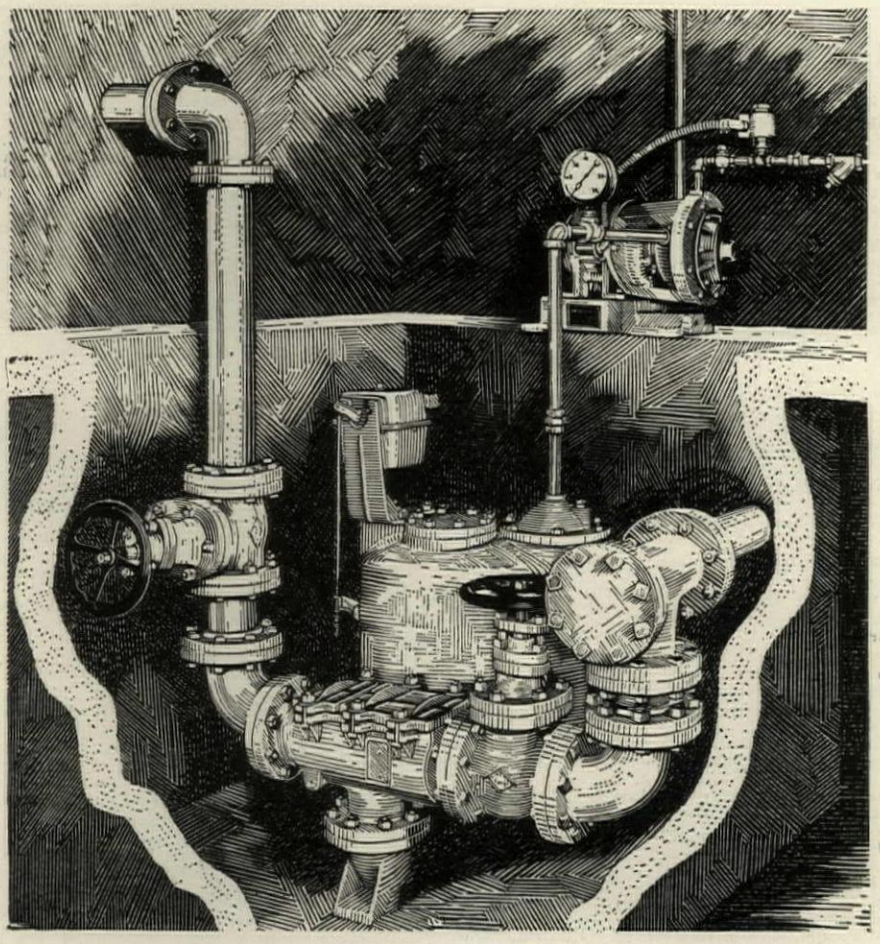

The Type B Jennings Sewage Ejector is furnished in two sizes with 30 and 50 g.p.m. capacities. Larger Type A Ejectors are supplied with capacities up to 1500 g.p.m. Heads up to 60 ft. Write for Bulletins 103 and 108.

Compact, reliable, low in cost

. . . for handling sewage up to 50 g.p.m.

EXPERIENCE proves that pneumatic ejectors are the most efficient equipment available for handling sewage. But, up to the present time, the use of ejectors has been limited to installations where the quantity of material to be moved was large.

Now, the same efficiency and dependability that always has characterized the larger capacity Jennings Ejector is made available in the new Type B Jennings Units. These are provided in two sizes, for handling up to 30 and 50 g.p.m., respectively. They are supplied at prices that compare favorably with other kinds of sewage-handling equipment.

These small Jennings Ejectors are not only low in first cost, but also require little attention and maintenance. Operation is entirely automatic. Clogging is impossible. No working parts come in contact with the sewage. There are no submerged impellers to need frequent inspection and cleaning. Low pressure air is furnished only when material is being moved. Air valves, air storage tanks, and screens are all dispensed with. Anything passing through a four-inch pipe is readily handled by the Type B Jennings Sewage Ejector.

Jennings Pumps

THE NASH ENGINEERING CO 12 WILSON ROAD, SOUTH NORWALK CONN.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 186*

FLOORING—Continued

Blabon Company, Geo. W., Nicetown, Philadelphia, Pa.
Planning the Color Schemes for Your Home. Brochure, illustrated in color; 36 pp., 7½ x 10½ ins. Gives excellent suggestions for use of color in flooring for houses and apartments.
Handy Quality Sample Folder of Linoleums. Gives actual samples of "Battleship Linoleum," cork carpet, "Feltex," etc.
Blabon's Linoleum. Booklet, illustrated in color; 128 pp., 3½ x 8½ ins. Gives patterns of a large number of linoleums.
Blabon's Plain Linoleum and Cork Carpet. Gives quality samples, 3 x 6 ins. of various types of floor coverings.

Cellized Oak Flooring, Memphis, Tenn.
Style in Oak Floors. Booklet, 16 pp., 6 x 9 ins. Illustrated.

Congoleum-Nairn, Inc., 195 Belgrove Drive, Kearny, N. J.
Facts you should know about Resilient Floors. A series of booklets on floors for (1) schools, (2) hospitals, (3) offices, (4) stores, (5) libraries, (6) churches, (7) clubs and lodges, (8) apartments and hotels. Illustrated.
Specifications for Resilient Floors. Booklet, 12 pp. A reprint from Sweet's.
A New Kind of Floor Service. Brochure, 8 pp. Data on Bonded Floors.
Sealex Battleship Linoleum. Booklet, 12 pp. Illustrated. Shows typical installations.
Sealex Treadlite Tiles. Two booklets, 8 and 16 pp. Illustrated.
Colonial Planks. Brochure, 8 pp. Illustrated.

National Lumber Manufacturers' Association, Transportation Building, Washington.
Wood Floors. Booklet. 30 pp., 8½ x 11 ins. Illustrated.

C. Pardee Works, 9 East 45th St., New York, N. Y., and 1600 Walnut St., Philadelphia, Pa.
Pardee Tiles. Bound Volume, 48 pp., 8½ x 11 ins. Illustrated.

Structural Gypsum Corporation, Linden, N. J.
Gypsteel Pre-cast Fireproof Floors. Booklet, 36 pp., 8½ x 11 ins. Illustrated. Data on floorings.

U. S. Gypsum Co., Chicago.
Pyrobar Floor Tile. Folder, 8½ x 11 ins. Illustrated. Data on building floors of hollow tile and tables on floor loading.

U. S. Rubber Co., 1790 Broadway, New York, N. Y.
Period Adaptations for Modern Floors. Brochure, 8 x 11 ins., 60 pp. Richly Illustrated. A valuable work on the use of rubber tile for flooring in interiors of different historic styles.

FURNITURE

American Seating Co., 14 E. Jackson Blvd., Chicago, Ill.
Art Ecclesiastical Booklet, 6 x 9 ins., 48 pp. Illustrations of church fitments in carved wood.
Theatre Chairs. Booklet, 6 x 9 ins., 48 pp. Illustrations of theatre chairs.

Kittinger Co., 1893 Elmwood Ave., Buffalo, N. Y.
Kittinger Club & Hotel Furniture. Booklet, 20 pp., 6¼ x 9½ ins. Illustrated. Deals with fine line of furniture for hotels, clubs, institutions, schools, etc.
Kittinger Club and Hotel Furniture. Booklet, 20 pp., 6 x 9 ins. Illustrated. Data on furniture for hotels and clubs.
A Catalog of Kittinger Furniture. Booklet, 78 pp., 11 x 14 ins. Illustrated. General Catalog.

McKinney Mfg. Co., Pittsburgh, Pa.
Forethought Furniture Plans. Sheets, 6¼ x 9 ins., drawn to ¼-inch scale. An ingenious device for determining furniture arrangement.

GLASS CONSTRUCTION

Adamson Flat Glass Co., Clarksburg, W. Va.
Quality and Dependability. Folder, 2 pp., 8½ x 11 ins. Illustrated. Data in the company's product.

Libbey-Owens Sheet Glass Co., Toledo, Ohio.
Flat Glass. Brochure, 12 pp., 5⅜ x 7⅝ ins. Illustrated. History of manufacture of flat, clear, sheet glass.

GREENHOUSES

King Construction Company, North Tonawanda, N. Y.
King Greenhouses for Home or Estate. Portfolio of half-tone prints, varnishes, 8¼ x 10½ ins.

William H. Lutton Company, 267 Kearney Ave., Jersey City, N. J.
Greenhouses of Quality. Booklet, 50 pp., 8½ x 11 ins. Illustrated. Conservatories making use of Lutton Patented Galvanized Steel V-Bar.

HARDWARE

P. & F. Corbin, New Britain, Conn.
Early English and Colonial Hardware. Brochure, 8½ x 11 ins. An important illustrated work on this type of hardware.
Locks and Builders' Hardware. Bound Volume, 486 pp., 8½ x 11 ins. An exhaustive, splendidly prepared volume.
Colonial and Early English Hardware. Booklet, 48 pp., 8½ x 11 ins. Illustrated. Data on hardware for houses in these styles.

Cutler Mail Chute Company, Rochester, N. Y.
Cutler Mail Chute Model F. Booklet, 4 x 9¼ ins., 8 pp. Illustrated.

HARDWARE—Continued

Richards-Wilcox Mfg. Co., Aurora, Ill.
Distinctive Garage Door Hardware. Booklet, 8½ x 11 ins., 66 pp. Illustrated. Complete information accompanied by data and illustrations on different kinds of garage door hardware.
Distinctive Elevator Door Hardware. Booklet, 90 pp., 10½ x 16 ins. Illustrated.

Russell & Erwin Mfg. Co., New Britain, Conn.
Hardware for the Home. Booklet, 24 pp., 3½ x 6 ins. Deals with residence hardware.
Door Closer Booklet. Brochure, 16 pp., 3½ x 6 ins. Data on a valuable detail.
Garage Hardware. Booklet, 12 pp., 3½ x 6 ins. Hardware intended for garage use.
Famous Homes of New England. Series of folders on old homes and hardware in style of each.

HEATING EQUIPMENT

American Blower Co., 6004 Russell St., Detroit, Mich.
Heating and Ventilating Utilities. A binder containing a large number of valuable publications, each 8½ x 11 ins., on these important subjects.

American Radiator Company, The, 40 West 40th St., N. Y. C.
Ideal Boilers for Oil Burning. Catalog 5½ x 8½ ins., 36 pp. Illustrated in 4 colors. Describing a line of Heating Boilers especially adapted to use with Oil Burners.
Corto—The Radiator Classic. Brochure, 5½ x 8½ ins., 16 pp. Illustrated. A brochure on a space-saving radiator of beauty and high efficiency.
Ideal Arcola Radiator Warmth. Brochure, 6¼ x 9½ ins. Illustrated. Describes a central all-on-one-floor heating plant with radiators for small residences, stores, and offices.
How Shall I Heat My Home? Brochure, 16 pp., 5¾ x 8½ ins. Illustrated. Full data on heating and hot water supply.
New American Radiator Products. Booklet, 44 pp., 5 x 7¾ ins. Illustrated. Complete line of heating products.
A New Heating Problem. Brilliantly Solved. Broadside, 4 pp., 10¾ x 15 ins. Illustrated. Data on the IN-AIRID invisible air valve.
In-Airid, the Invisible Air Valve. Folder, 8 pp., 3½ x 6 ins. Illustrated. Data on a valuable detail of heating.
The 999 ARCO Packless Radiator Valve. Folder, 8 pp., 3½ x 6 ins. Illustrated.

James B. Clow & Sons, 534 S. Franklin St., Chicago, Ill.
Clow Gasteam Vented Heating System. Brochure, 24 pp., 8½ x 11 ins. Illustrated. Deals with a valuable form of heating equipment for using gas.

C. A. Dunham Company, 450 East Ohio St., Chicago, Ill.
Dunham Radiator Trap. Bulletin 101, 8 x 11 ins., 12 pp. Illustrated. Explains working of this detail of heating apparatus.
Dunham Packless Radiator Valves. Bulletin 104, 8 x 11 ins., 8 pp. Illustrated. A valuable brochure on valves.
Dunham Return Heating System. Bulletin 109, 8 x 11 ins. Illustrated. Covers the use of heating apparatus of this kind.
Dunham Vacuum Heating System. Bulletin 110, 8 x 11 ins., 12 pp. Illustrated.
The Dunham Differential Vacuum Heating System. Bulletin 114. Brochure, 12 pp., 8 x 11 ins. Illustrated. Deals with heating for small buildings.
The Dunham Differential Vacuum Heating System. Bulletin 115. Brochure, 12 pp., 8 x 11 ins. Illustrated. Deals with heating for large buildings.

The Fulton Sylphon Company, Knoxville, Tenn.
Sylphon Temperature Regulators. Illustrated brochures, 8½ x 11 ins., dealing with general architectural and industrial applications; also specifically with applications of special instruments.
Sylphon Heating Specialties. Catalog No. 200, 192 pp., 3½ x 6¾ ins. Important data on heating.

Hoffman Specialty Company, Inc., 25 West 45th St., New York, N. Y.
Heat Controlled With the Touch of a Finger. Booklet, 46 pp., 5¾ x 8¾ ins. Illustrated.
How to Lock Out Air, the Heat Thief. Brochure, 48 pp., 5 x 7¾ ins. Illustrated.

Janette Manufacturing Company, 556 West Monroe Street, Chicago.
More Heat from Any Hot Water System on Less Fuel. Folder. 4 pp., 8½ x 11 ins. Illustrated. Deals with use of the "Hydrolator."

S. T. Johnson Co., Oakland, Calif.
Johnson Oil Burners. Booklet, 9 pp., 8½ x 11 ins. Illustrated.
Bulletin No. 4A. Brochure, 8 pp., 8½ x 11 ins. Illustrated. Data on different kinds of oil-burning apparatus.
Bulletin No. 31. Brochure, 8 pp., 8½ x 11 ins. Illustrated. Deals with Johnson Rotary Burner with Full Automatic Control.

Kewanee Boiler Corporation, Kewanee, Ill.
Kewanee on the Job. Catalog, 8½ x 11 ins., 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators. etc.
Catalog No. 78, 6 x 9 ins. Illustrated. Describes Kewanee Firebox Boilers with specifications and setting plans.
Catalog No. 79, 6 x 9 ins. Illustrated. Describes Kewanee power boilers and smokeless tubular boilers with specifications.

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THIS is an air-eye view of any city, showing hundreds of Carey Built-up Roofs—on schools, institutions, industrial buildings, apartments and residences. In any city, there is a Carey service representative, ready to tell you about the Carey roofing specifications that *fit* the building you are designing. And, in any and every city, architects know that the building with the Carey roof—*the gold bond roof*—wears *plus-quality* protection.

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Carey
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"A ROOF FOR EVERY BUILDING"

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 188*

HEATING EQUIPMENT—Continued

May Oil Burner Corp., Baltimore, Md.
Adventures in Comfort. Booklet, 24 pp., 6 x 9 ins. Illustrated. Non-technical data on oil as fuel.
Taking the Quest Out of the Question. Brochure, 16 pp., 6 x 9 ins. Illustrated. For home owners interested in oil as fuel.

McQuay Radiator Corporation, 35 East Wacker Drive, Chicago, Ill.
McQuay Visible Type Cabinet Heater. Booklet, 4 pp., 8½ x 11 ins. Illustrated. Cabinets and radiators adaptable to decorative schemes.
McQuay Concealed Radiators. Brochure, 4 pp., 8½ x 11 ins. Illustrated.
McQuay Unit Heater. Booklet, 8 pp., 8½ x 11 ins. Illustrated. Gives specifications and radiator capacities.

Modine Mfg. Co., Racine, Wisc.
Modine Copper Radiation. Booklet, 28 pp. 8½ x 11 ins. Illustrated. Deals with industrial, commercial and domestic heating.
A Few Short Years. Folder. 4 pp. 8½ x 11 ins. Illustrated. Heating for garages.
Dairy Plant Heating. Folder. 4 pp., 8½ x 11 ins. Illustrated.
Industrial Heating. Folder. 4 pp., 8½ x 11 ins. Illustrated.
Modine Unit Heater. Folder. 6 pp., 8½ x 11 ins. Illustrated.

Nash Engineering Company, South Norwalk, Conn.
Bulletin 85. Booklet. 12 pp. 10¾ x 7½ ins. Illustrated in color. Describes construction and operation of the Jennings Return Line Vacuum Heating Pump.
Bulletin 87. Brochure. 8 pp. 10¾ x 7½ ins. Illustrated in color. Deals with Sizes T and U Jennings Vacuum Heating Pump for 2500 and 5000 square feet equivalent direct radiation.
Bulletin 63. Booklet. 4 pp. 10¾ x 7½ ins. Illustrated. Describes in detail the Unit Type Motor Driven Jennings Condensation Pump.

National Radiator Corporation, Johnstown, Pa.
Aero Radiators; Beauty and Worth. Catalog 34. Booklet, 6 x 9 ins., 20 pp., describing and illustrating radiators and accessories.
Six Great Companies Unite to Form a Great Corporation. Booklet, 28 pp., 8½ x 10½ ins. Illustrated. Valuable data on heating.

Prometheus Electric Corporation, 360 West 13th St., New York.
Electric Heating Specialties. Booklet, 24 pages. 8½ x 11 ins. Illustrated. Specialties for heating, cooking, hospitals, organ lofts, etc.

Rome Brass Radiator Corporation, 1 East 42nd Street, New York.
Proof of the Pudding. Booklet, 24 pp., 8½ x 10½ ins. Illustrated. Describes Robras, 20-20 concealed-within-the-walls, lightweight, all-brass radiators.
Within the Walls. Brochure, 16 pp., 4 x 9 ins. Illustrated. Gives facts regarding modern, out-of-sight, lightweight, Robras 20-20 radiators.
Engineering Data. Booklet, 16 pp., 8½ x 10½ ins. Illustrated. Full data and tables to facilitate selection and installation of Robras 20-20 concealed radiators for steam, water and vapor heating systems.
Small Bathrooms Made More Spacious, Brochure, 4 pp. Illustrated. Gives descriptions, sizes and prices of Robras lightweight cabinet radiators to be installed under wash basins.

Sarco Company, Inc., 183 Madison Ave., New York City, N. Y.
Steam Heating Specialties. Booklet, 6 pp., 6 x 9 ins. Illustrated. Data on Sarco Packless Supply Valves and Radiator Traps for vacuum and vapor heating systems.
Equipment Steam Traps and Temperature Regulations. Booklet, 6 pp., 6 x 9 ins. Illustrated. Deals with Sarco Steam Traps for hospital, laundry and kitchen fixtures and the Sarco Self-contained Temperature Regulation for hot water service tanks.

Spencer Heater Co., Williamsport, Pa.
Catalog. Booklet, 20 pp., 6⅛ x 9 ins. Illustrated. Complete line of magazine feed cast iron sectional and steel tubular heaters.
The Fire that Burns Uphill. Brochure, 24 pp., 6⅛ x 9¼ ins. Illustrated in color. Magazine feed heaters for steam, vapor and hot water heating.

B. F. Sturtevant Company, Hyde Park, Boston, Mass.
Tempervane Heating Units. Catalog 363. Booklet, 44 pp., 8½ x 11 ins. Illustrated. Data on "Heating Every Corner with Maximum Economy."

Trane Co., The, La Crosse, Wis.
Bulletin 14, 16 pp., 8½ x 10⅝ ins. Covers the complete line of Trane Heating Specialties, including Trane Bellows Traps, and Trane Bellows Packless Valves.
Bulletin 20. 24 pp., 8½ x 10⅝ ins. Explains in detail the operation and construction of Trane Condensation. Vacuum, Booster, Circulating, and similar pumps.
How to Cut Heating Costs. Booklet, 18 pp., 8½ x 11 ins. Illustrated.

HOISTS, TELESCOPIC

Gillis & Geoghegan, Inc. 535 West Broadway, New York.
G & G Telescopic Hoist. Booklet. 24 pp. 8½ x 11 ins. Illustrated complete data on hoists.
Ash Removal. Folder. 8½ x 11 ins. Illustrated. Hoists for removing ashes from basements.

HOSPITAL EQUIPMENT

The Frink Co., Inc., 369 Lexington Ave., New York City.
Catalog 426. 7 x 10 ins., 16 pp. A booklet illustrated with photographs and drawings, showing the types of light for use in hospitals, as operating table reflectors, linolite and multilite concentrators, ward reflectors, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses.

Holophane Company, 342 Madison Avenue, New York.
Lighting Specific for Hospitals. Booklet, 30 pp., 8½ x 11 ins. Illustrated.

The International Nickel Company, 67 Wall St., New York, N. Y.
Hospital Applications of Monel Metal. Booklet, 8½ x 11½ ins., 16 pp. Illustrated. Gives types of equipment in which Monel Metal is used, reasons for its adoption, with sources of such equipment.

Pick-Barth Company, Inc., Albert, 1200 West 35th St., Chicago, and Cooper Square, New York.
Some Thoughts About Hospital Food Service Equipment. Booklet, 22 pp., 7½ x 9¼ ins. Valuable data on an important subject.

Prometheus Electric Corporation, 360 West 13th St., New York.
Electric Heating Specialties. Booklet, 24 pages. 8½ x 11 ins. Illustrated. Specialties for heating, cooking, hospitals, organ lofts, etc.

HOTEL EQUIPMENT

Pick-Barth Company, Inc., Albert, 1200 West 35th St., Chicago, and Cooper Square, New York.
Some Thoughts on Furnishing a Hotel. Booklet, 7½ x 9 ins. Data on complete outfitting of hotels.

INCINERATORS

Home Incinerator Co., Milwaukee, Wis.
The Decent Way. Burn it with Gas. Brochure, 30 pp., 5¼ x 7¼ ins., inside. Illustrated. Incinerator sanitation equipment for residence use.
A. I. A. File, 12 pp., 8¾ x 10¾ ins., inside. Suggestions for architect on incineration, showing installation and equipment.
Specialized Home Comforts Service Plan Book. 40 pp., 8½ x 11 ins., inside. Illustrated. A complete outline of the many advantages of incineration.
Blue Star Standards in Home Building. 16 pp., 5½ x 8½ ins., inside. Illustrated. Explaining fully the Blue Star principles, covering heat, incineration, refrigeration, etc.

Josam Mfg. Co., Michigan City, Ind.
Josam-Graver Incinerators. Folder, 4 pp., 8½ x 11 ins. Illustrated.

Kerner Incinerator Company, 715 E. Water St., Milwaukee, Wis.
Incinerators (Chimney-fed). Catalog No. 15 (Architect and Builders' Edition). Size 8½ x 11 ins., 16 pp. Illustrated. Describes principles and design of Kernerator Chimney-fed Incinerators for residences, apartments, hospitals, schools, apartment hotels, clubs and other buildings. Shows all standard models and gives general information and working data.
Sanitary Elimination of Household Waste. Booklet, 4 x 9 ins. 16 pp. Illustrated. Gives complete information on the Kernerator for residences.
Garbage and Waste Disposal for Apartment Buildings. Folder, 8½ x 11 ins., 16 pp. Illustrated. Describes principle and design of Kernerator 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 Kernerator. Gives list of hospitals where installed.
The Kernerator (Chimney-fed) Booklet. Catalog No. 17, 20 pp., 8½ x 11 ins. Illustrated. Data on a valuable detail of equipment.

INSULATION

Armstrong Cork & Insulation Co., Pittsburgh, Pa.
The Insulation of Roofs with Armstrong's Corkboard. Booklet. Illustrated. 7½ x 10½ ins., 32 pp. Discusses means of insulating roofs of manufacturing or commercial structures.
Insulation of Roofs to Prevent Condensation. Illustrated booklet, 7½ x 10½ 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.
The Cork-lined House Makes a Comfortable Home. 5 x 7 ins. 32 pp. Illustrated.
Armstrong's Corkboard. Insulation for Walls and Roofs of Buildings. Booklet, 66 pp., 9½ x 11¾ ins. Illustrates and describes use of insulation for structural purposes.

National Lumber Manufacturers' Association, Transportation Building, Washington.
The Cost of Comfort. Booklet. 80 pp., 8½ x 11 ins. Illustrated. A handbook on the economies of dwelling insulation.

Structural Gypsum Corporation, Linden, N. J.
Heat Insulation Value of Gypsteel. Folder, 4 pp., 8½ x 11 ins. Brochure, by Charles L. Norton, of M. I. T.

JOISTS

Bates Expanded Steel Truss Co., East Chicago, Ind.
Catalog No. 4. Booklet, 32 pp., 8½ x 11 ins. Illustrated. Gives details of truss construction with loading tables and specifications.

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Concrete Floor Paint
Wood Finishes and Waxes

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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 190*

JOISTS—Continued

Concrete Steel Company, 42 Broadway, New York, N. Y.
Structural Economies for Concrete Floors and Roofs. Booklet, 32 pp., 8½ x 11 ins. Illustrated.
Modern Concrete Reinforcement. Brochure, 32 pp., 8½ x 11 ins. Illustrated.
Construction Details for Installing Havemeyer Trusses. Data sheets, 8½ x 11 ins. Illustrated.
Standard Practice for Placing Havemeyer Reinforcement in Columns, Beams and Slabs. Data sheets, 8½ x 11 ins. Illustrated.

KITCHEN EQUIPMENT

The International Nickel Company, 67 Wall St., New York, N. Y.
Hotels, Restaurants and Cafeteria Applications of Monel Metal. Booklet, 8½ x 11 ins., 32 pp. Illustrated. Gives types of equipment in which Monel Metal is used, with service data and sources of equipment.

Prometheus Electric Corporation, 360 West 13th St., New York.
Electric Heating Specialties. Booklet, 24 pages. 8½ x 11 ins. Illustrated. Specialties for heating, cooking, hospitals, organ lofts, etc.

John Van Range Co., Cincinnati.
Practical Planning for Church Food Service. Booklet, 32 pp., 8½ x 11 ins. Illustrated.
Practical Planning for School Service. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

LABORATORY EQUIPMENT

Alberene Stone Co., 153 West 23rd Street, New York City.
Booklet, 8¼ x 11¼ ins., 26 pp. Stone for laboratory equipment, shower partitions, stair treads, etc.

Duriron Company, Dayton, Ohio.
Duriron Acid, Alkali and Rust-proof Drain Pipe and Fittings. Booklet, 8½ x 11 ins., 20 pp. Full details regarding a valuable form of piping.

LANTERNS

Todhunter, Arthur, 119 E. 57th St., New York, N. Y.
Hand-wrought Lanterns. Booklet, 5¼ x 6¾ ins., 20 pp. Illustrated in black and white. With price list. Lanterns appropriate for exterior and interior use, designed from old models and meeting the requirements of modern lighting.

LATH, METAL AND REINFORCING

Milwaukee Corrugating Co., Milwaukee
The Milcor Manual. Booklet, 96 pp., 8½ x 11 ins. Illustrated. Data on metal lath and similar materials.
Milcor Metal Ceiling Catalog. Booklet, 288 pp., 8½ x 11 ins. Illustrated. Data on metal ceiling and wall construction.

National Steel Fabric Co., Pittsburgh, Pa.
Better Walls for Better Homes. Brochure, 16 pp., 7¾ x 11¼ ins. Illustrated. Metal lath, particularly for residences.
Steeltex for Floors. Booklet, 24 pp., 8½ x 11 ins. Illustrated. Combined reinforcing and form for concrete or gypsum floors and roofs.
Steeltex Data Sheet No. 1. Folder, 8 pp., 8½ x 11 ins. Illustrated. Steeltex for floors on steel joists with round top chords.
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.

North Western Expanded Metal Co., 1234 Old Colony Building, Chicago, Ill.
North Western Expanded Metal Products. Booklet, 8½ x 10¾ ins., 20 pp. Fully illustrated, and describes different products of this company, such as Kno-burn metal lath, 20th Century Corrugated. Plasta-saver and longspan lath channels, etc.
Longspan ¾-inch Rib Lath. Folder, 4 pp., 8½ x 11 ins. Illustrated. Deals with a new type of V-Rib expanded metal.
A. I. A. Sample Book. Bound volume, 8½ x 11 ins. Contains actual samples of several materials and complete data regarding their use.
Norwest Metal Lath. Folder, 8½ x 11 ins. Illustrated. Data on Flat Rib Lath.

Truscon Steel Company, Youngstown, Ohio.
Truscon ¾-inch Hy-Rib for Roofs, Floors and Walls. Booklet, 8½ x 11 ins., illustrating Truscon ¾-inch Hy-Rib as used in industrial buildings. Plates of typical construction. Progressive steps of construction. Specification and load tables.

LAUNDRY MACHINERY

Troy Laundry Machinery Co., Inc., 9 Park Place, New York City.
Laundry Machinery for Large Institutions. Loose-Leaf booklet, 50 pp., 8½ x 11 ins. Illustrated.
Laundry Machinery for Small Institutions. Loose-leaf brochure, 50 pp., 8½ x 11 ins. Illustrated.
Accessory Equipment for Institutional Laundries. Leather bound book, 50 pp., 8½ x 11 ins. Illustrated.
Dry Cleaning Equipment for Institutional Purposes. Brochure, 50 pp., 8½ x 11 ins. Illustrated.

LIGHTING EQUIPMENT

The Frink Co., Inc., 369 Lexington Ave., New York, N. Y.
Catalog 415, 8½ x 11 ins., 46 pp. Photographs and scaled cross-sections. Specialized bank lighting, screen and partition reflectors, double and single desk reflectors and Polaralite Signs.

Holophane Company, Inc., 342 Madison Ave., New York, N. Y.
The Lighting of Schools; A Guide to Good Practice. Booklet. 24 pp., 8½ x 11 ins. Illustrated.
Lighting Specifications for Hospitals. Brochure, 30 pp., 8½ x 11 ins. Illustrated.
Industrial Lighting. Bulletin 448A. Booklet, 24 pp., 8½ x 11 ins. Illustrated.
Holophane Catalog. Booklet, 48 pp., 8½ x 11 ins. Combination catalog and engineering data book.
The Lighting of Schools. A Guide to Good Practice. Booklet, 24 pp., 8½ x 11 ins. Illustrated.

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.

Todhunter, 119 East 57th St., New York, N. Y.
Lighting Fixtures, Lamps and Candlesticks. 24 pp., 8½ x 11 ins. Illustrated. Fine assortment of lighting accessories.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.
Industrial Lighting Equipment. Booklet, 32 pp., 8½ x 11 ins. Illustrated.
Commercial Lighting. Brochure, 24 pp., 8½ x 11 ins. Illustrated.
Airport and Floodlighting Equipment. Booklet, 20 pp., 8½ x 11 ins. Illustrated.

LUMBER

National Lumber Mfrs. Assn., Washington, D. C.
Use of Lumber on the Farm. Booklet, 38 pp., 8½ x 11 ins. Illustrated.

MAIL CHUTES

Cutler Mail Chute Company, Rochester, N. Y.
Cutler Mail Chute Model F. Booklet, 4 x 9¼ ins., 8 pp. Illustrated.

MANTELS

Henry Klein & Co., Inc. 40-46 West 23rd Street, New York.
Driwood Mantels. Booklet. 12 pp. 8½ x 11 ins. Illustrated. Fine line of eighteenth century English and American mantels.

Arthur Todhunter, 119 E. 57th St., New York, N. Y.
Georgian Mantels. New booklet, 24 pp., 5¾ x 6¾ ins. A fully illustrated brochure on eighteenth century mantels. Folders give prices of mantels and illustrations and prices of fireplace equipment.

MARBLE

The Georgia Marble Company, Tate, Ga.; New York Office, 1328 Broadway.
Why Georgia Marble Is Better. Booklet, 3⅜ x 6 ins. Gives analysis, physical qualities, comparison of absorption with granite, opinions of authorities, etc.
Convincing proof. 3⅜ x 6 ins., 8 pp. Classified list of buildings and memorials in which Georgia Marble has been used, with names of Architects and Sculptors.
Hurt Building, Atlanta; Senior High School and Junior College, Muskegon, Mich. Folders, 4 pp., 8½ x 11 ins. Details.

METALS

Aluminum Company of America, Pittsburgh.
Architectural Aluminum. Brochure, 30 pp., 8½ x 11 ins. Illustrated. An excellent booklet on the subject.

Central Alloy Steel Corporation, Massillon, Ohio.
Sheet Iron Primer. Booklet, 64 pp., 5¼ x 7¾ ins. Illustrated.
The Path to Permanence. Brochure, 52 pp., 8½ x 11 ins. Illustrated. Data on sheet iron.

The International Nickel Company, 67 Wall St., New York N. Y.
Monel Metal Primer. 8 folders, 4 pp., 8½ x 11 ins. Illustrated. Valuable data on use of monel in kitchens, laundries, etc.

MILL WORK—See also Wood

Curtis Companies Service Bureau, Clinton, Iowa.
Architectural Interior and Exterior Woodwork. Standardized Book, 9 x 11½ ins., 240 pp. Illustrated. This is an Architects' Edition of the complete catalog of Curtis Woodwork, as designed by Trowbridge & Ackerman. Contains many color plates.
Better Built Homes. Vols. XV-XVIII, incl. Booklet, 9 x 12 ins., 40 pp. Illustrated. Designs for houses of five to eight rooms, respectively, in several authentic types, by Trowbridge & Ackerman, architects for the Curtis Companies.
Curtis Details. Booklet, 19½ x 23½ ins., 20 pp. Illustrated. Complete details of all items of Curtis woodwork, for the use of architects.
Curtis Cabinet and Stair Work. Booklet, 48 pp., 7¾ x 10½ ins. Illustrated.
Curtis Windows. Brochure, 7¾ x 10½ ins. Illustrated.
Curtis Interior Doors. Booklet, 7¾ x 10½ ins. Illustrated.
Curtis Entrances and Exterior Doors. Brochure, 7¾ x 10½ ins. Illustrated.

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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 192*

MILL WORK—See also Wood—Continued

Hartmann-Sanders Company, 2155 Elston Ave., Chicago, Ill.
Column Catalog, 7½ x 10 ins., 48 pp. Illustrated. Contains prices on columns 6 to 36 ins. diameter, various designs and illustrations of columns and installations.
The Pergola Catalog. 7½ x 10 ins., 64 pp. Illustrated. Contains illustrations of pergola lattices, garden furniture in wood and cement, garden accessories.

Klein & Co., Inc., Henry, 11 East 37th St., New York, N. Y.
Two Driwood Interiors. Folder, 4 pp., 6¼ x 9 ins. Illustrated. Use of moulding for paneling walls.
A New Style in Interior Decoration. Folder, 4 pp., 6¼ x 9 ins. Illustrated. Deals with interior woodwork.
Driwood Period Mouldings in Ornamented Wood. Booklet, 28 pp., 8½ x 11 ins. Illustrated.
How Driwood Period Mouldings in Ornamented Wood Set a New Style in Decoration. Folder.

Roddis Lumber and Veneer Co., Marshfield, Wis.
Roddis Doors. Brochure, 24 pp., 5¼ x 8½ ins. Illustrated price list of doors for various types of buildings.
Roddis Doors, Catalog G. Booklet, 184 pp., 8½ x 11 ins. Completely covers the subject of doors for interior use.
Roddis Doors for Hospitals. Brochure, 16 pp., 8½ x 11 ins. Illustrated work on hospital doors.
Roddis Doors for Hotels. Brochure, 16 pp., 8½ x 11 ins. Illustrated work on doors for hotel and apartment buildings.

MORTAR AND CEMENT COLORS

Clinton Metallic Paint Co., Clinton, N. Y.
Clinton Mortar Colors. Folder, 8½ x 11 ins., 4 pp. Illustrated in colors, gives full information concerning Clinton Mortar Colors with specific instructions for using them.
Color Card. 3¼ x 6½ ins. Illustrates in color the ten shades in which Clinton Mortar Colors are manufactured.
Something New in Stucco. Folder, 3½ x 6 ins. An interesting folder on the use of coloring matter for stucco coated walls.

ORNAMENTAL PLASTER

Jacobson & Co., 241 East 44th St., New York, N. Y.
A Book of Old English Designs. Brochure, 47 plates, 12 x 9 ins. Deals with a fine line of decorative plaster work.
Architectural and Decorative Ornaments. Cloth bound volume, 184 pp., 9 x 12 ins. 18 plates. Price, $3.00. A general catalog of fine plaster ornaments.
Geometrical ceilings. Booklet, 23 plates, 7 x 9 ins. An important work on decorative plaster ceilings.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Minwax Company, Inc., 11 West 42nd St., New York.
Color Card and Specifications for Minwax Brick and Cement Coating. Folder, 4 pp., 8½ x 11 ins. Illustrated.

National Lead Company, 111 Broadway, New York, N. Y.
Handy Book on Painting. Book, 5½ x 3¼ ins., 100 pp. Gives directions and formulæ for painting various surfaces of wood, plaster, metals, etc., both interior and exterior.
Red Lead in Paste Form. Booklet. 6¼ x 3½ ins., 16 pp. Illustrated. Directions and formulæ for painting metals.
Came Lead. Booklet, 6 x 8¾ ins., 12 pp. Illustrated. Describes various styles of lead cames.

Pratt & Lambert, Inc., Buffalo, N. Y.
Specification Manual for Paint, Varnishing and Enameling. Booklet, 38 pp., 7½ x 10⅝ ins. Complete specifications for painting, varnishing and enameling interior and exterior wood, plaster, and metal work.

Sherwin-Williams Company, 601 Canal Rd., Cleveland, Ohio.
Complete Architectural Specifications for painting, varnishing and lacquering, reprinted from the Sherwin-Williams Architectural Catalogue as it appears in Sweet's Architectural Catalogue. Form Number B 303. 8½ x 11, bound in paper, thirty pages of specifications and color chips; carries A. I. A. file number.

Sonneborn Sons, Inc., L., Dept. 4, 116 Fifth Ave., New York. N. Y.
Paint Specifications. Booklet, 8½ x 10¾ ins., 4 pp.

Toch Brothers, New York, Chicago, Los Angeles.
Architects' Specification Data. Sheets in loose leaf binder, 8½ x 11 ins., dealing with an important line of materials.

U. S. Gutta Percha Paint Co., Providence, R. I.
Barreled Sunlight. Booklet, 8½ x 11 ins. Data on "Barreled Sunlight" with specifications for its use.

PARCEL DELIVERY DEVICES

Receivador Sales Company, Grand Rapids, Mich.
Architects' Portfolio. Booklet, 12 pp., 8½ x 11 ins. Illustrated. Deals with delivery problems and their solution.

PARTITIONS

Circle A. Products Corporation, New Castle, Ind.
Circle A. Partitions Sectional and Movable. Brochure. Illustrated. 8½ x 11¼ ins., 32 pp. Full data regarding an important line of partitions, along with Erection Instructions for partitions of three different types.

Dahlstrom Metallic Door Company, Jamestown, N. Y.
Dahlstrom Standard Steel Partitions. Booklet, 24 pp., 8½ x 11 ins. Illustrated.

Irving Hamlin, Evanston, Ill.
Hamlinized Folding Partitions Made from Hamlin's Evanston Soundproof Doors, Sectional and Movable. Folder, 4 pp., 8½ x 11 ins. Illustrated.

Hauserman Company, E. F., Cleveland, Ohio.
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.

Henry Klein & Co., 25 Grand Street, Elmhurst, L. I., N. Y.
Telesco Partition. Catalog, 8¼ x 11 ins., 14 pp. Illustrated. Shows typical offices laid out with Telesco partitions, cuts of finished partition units in various woods. Gives specifications and cuts of buildings using Telesco.
Detailed Instructions for Erecting Telesco Partitions. Booklet, 24 pp., 8½ x 11 ins. Illustrated. Complete instructions, with cuts and drawings, showing how easily Telesco Partition can be erected.

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

Richards-Wilcox Mfg. Co., Aurora, Ill.
Partitions. Booklet, 7 x 10 ins., 32 pp. Illustrated. Describes complete line of track and hangers for all styles of sliding parallel, accordion and flush-door partitions.

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

U. S. Gypsum Co., Chicago, Ill.
Pyrobar Partition and Furring Tile. Booklet, 8½ x 11 ins., 24 pp. Illustrated. Describes use and advantages of hollow tile for inner partitions.

PIPE

American Brass Company, Waterbury, Conn.
Bulletin B-1. Brass Pipe for Water Service. 8½ x 11 ins., 28 pp. Illustrated. Gives schedule of weights and sizes (I.P.S.) of seamless brass and copper pipe, shows typical installations of brass pipe, and gives general discussion of the corrosive effect of water on iron, steel and brass pipe.

American Rolling Mill Company, Middletown, Ohio.
How ARMCO Dredging Products Cut Costs. Booklet, 16 pp., 6 x 9 ins. Data on dredging pipe.

Clow & Sons, James B., 534 S. Franklin St., Chicago, Ill.
Catalog A. 4 x 16½ ins., 700 pp. Illustrated. Shows a full line of steam, gas and water works supplies.

Cohoes Rolling Mill Company, Cohoes, N. Y.
Cohoes Pipe Handbook. Booklet, 40 pp., 5 x 7½ ins. Data on wrought iron pipe.

Duriron Company, Dayton, Ohio.
Duriron Acid, Alkali, Rust-proof Drain Pipe and Fittings. Booklet, 20 pp., 8½ x 11 ins. Illustrated. Important data on a valuable line of pipe.

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 deareating systems for eliminating or retarding corrosion in hot water supply lines.
"National" Bulletin No. 25. "National" Pipe in Large Buildings. 8½ x 11 ins., 88 pp. This bulletin contains 254 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

Best Bros. Keene's Cement Co., Medicine Lodge, Kans.
Information Book. Brochure, 24 pp., 5 x 9 ins. Lists grades of plaster manufactured; gives specifications and uses for plaster.
Plasterers' Handbook. Booklet, 16 pp., 3½ x 5½ ins. A small manual for use of plasterers.

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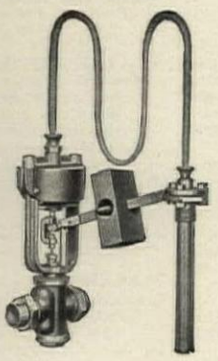

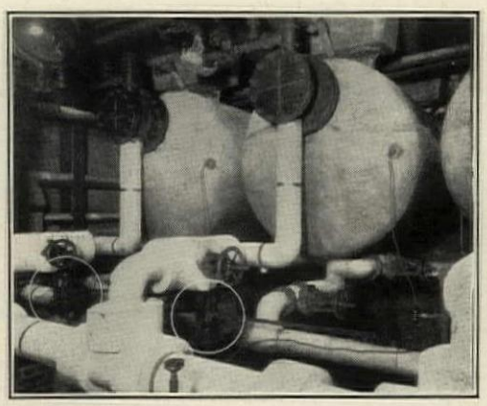

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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 194*

PLASTER—Continued

Interior Walls Everlasting. Brochure, 20 pp., 6¼ x 9¼ ins. Illustrated. Describes origin of Keene's Cement and views of buildings in which it is used.

PLUMBING EQUIPMENT

Clow & Sons, James B., 534 S. Franklin St., Chicago, Ill.
Catalog M. 9¼ x 12 ins., 184 pp. Illustrated. Shows complete line of plumbing fixtures for Schools, Railroads and Industrial Plants.

Crane Company, 836 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 6½ ins., 34 pp. Illustrated.
Planning the Small Bathroom. Booklet, 5 x 8 ins. Discusses planning bathrooms of small dimensions.

John Douglas Co., Cincinnati, Ohio.
Douglas Plumbing Fixtures. Bound volume, 200 pp., 8½ x 11 ins. Illustrated. General catalog.
Another Douglas Achievement. Folder, 4 pp., 8½ x 11 ins. Illustrated. Data on new type of stall.
Hospital. Brochure, 60 pp., 8½ x 11 ins. Illustrated. Deals with fixtures for hospitals.

Duriron Company, Dayton, Ohio.
Duriron Acid, Alkali and Rust-Proof Drain Pipe and Fittings. Booklet, 8½ x 11 ins., 20 pp. Full details regarding a valuable form of piping.

Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill.
Watrous Patent Flush Valves, Duojet Water Closets, Liquid Soap Fixtures, etc. 8½ x 11 ins., 136 pp., loose-leaf catalog, showing roughing-in measurements, etc.

Maddock's Sons Company, Thomas, Trenton, N. J.
Catalog K. Booklet, 150 pp., 8½ x 10⅞ ins. Illustrated. Data on vitreous china plumbing fixtures with brief history of Sanitary Pottery.

Speakman Company, Wilmington, Del.
Catalog K. Booklet, 150 pp., 8½ x 10⅞ ins. Illustrated. Data on showers and equipment details.

Trenton Potteries Company, Trenton, N. J.
The Blue Book of Plumbing. Bound volume, 182 pp., 8½ x 10½ ins. Illustrated.

PNEUMATIC TUBE SYSTEMS

G & G Atlas Systems, Inc., 544 West Broadway, New York.
12 pp., 8½ x 11. Illustrated booklet of tube systems for retail stores and other buildings.
4 pp., 8½ x 11. Data Sheet showing schematic diagrams for hotel, bank, factory and wholesale buildings, table of sizes, space requirements and preliminary layout steps. A. I. A. 35h21.

PUMPS

Kewanee Private Utilities Co., 442 Franklin St., Kewanee, Ill.
Bulletin E. 7¾ x 10¾ ins., 32 pp. Illustrated. Catalog. Complete descriptions, with all necessary data, on Standard Service Pumps, Indian Brand Pneumatic Tanks, and Complete Water Systems, as installed by Kewanee Private Utilities Co.

Nash Engineering Company, South Norwalk, Conn.
Bulletin 52. Brochure. 6 pp., 10½ x 7¾ ins. Illustrated in color. Devoted to Jennings Standard Centrifugal Pumps for house service, boosting city water pressure to supply top stories, for circulating warm water, etc.
Bulletin 97. Booklet. 16 pp., 10½ x 7¾ ins. Illustrated in color. Describes the design, construction and operation of the Jennings Suction Sump Pump.
Bulletin 11. Brochure. 8 pp., 10½ x 7¾ ins. Illustrated in color. Deals with Nash Hytor Vacuum Pumps for air and gases.

The Trane Co., La Crosse, Wis.
Trane Small Centrifugal Pumps. Booklet, 3¾ x 8 ins., 16 pp. Complete data on an important type of pump.

RAMPS

Ramp Buildings Corporation, 21 East 40th St., New York, N. Y.
Building Garages for Profitable Operation. Booklet, 8½ x 11 ins. 16 pp. Illustrated. Discusses the need for modern mid-city, parking garages, and describes the d'Humy Motoramp system of design, on the basis of its superior space economy and features of operating convenience. Gives cost analyses of garages of different sizes, and calculates probable earnings.
Garage Design Data. Series of informal bulletins issued in loose-leaf form, with monthly supplements.

REFRIGERATION

The Fulton Syphon Company, Knoxville, Tenn.
Temperature Control of Refrigeration Systems. Booklet, 8 pp., 8½ x 11 ins. Illustrated. Deals with cold storage, chilling of water, etc.

North Western Expanded Metal Company, Chicago, Ill.
Designing Data. Book, 6 x 9 ins., 96 pp. Illustrated. Covers the use of Econo Expanded Metal for various types of reinforced concrete construction.

REINFORCED CONCRETE—See also Construction, Concrete

North Western Expanded Metal Company, Chicago, Ill.
Longspan ¾-inch Rib Lath. Folder, 4 pp., 8½ x 11 ins. Illustrated. Deals with a new type of V-Rib expanded metal.

Truscon Steel Company, Youngstown, Ohio.
Shearing Stresses in Reinforced Concrete Beams. Booklet, 8½ x 11 ins., 12 pp.

RESTAURANT EQUIPMENT

John Van Range Company, Cincinnati.
Planning Restaurants That Make Money. Booklet, 78 pp., 8½ x 11 ins. Illustrated. Excellent work on equipment.

ROOFING

The Barrett Company, 40 Rector St., New York City.
Architects' and Engineers' Built-up Roofing Reference Series; Volume IV Roof Drainage System. Brochure, 64 pp., 8½ x 11¼ ins. Gives complete data and specifications for many details of roofing.

Federal Cement Tile Co., 608 S. Dearborn Street, Chicago.
Catalog and Roof Standards. Booklet, 36 pp. 8½ x 11 ins. Illustrated. Describes Featherweight Concrete Insulating Roof Slabs, including complete data, weights and dimensions, specifications and detail drawings. Also includes complete information on Featherweight Nailing Concrete Roof Slabs for use with ornamented slate or copper covering. The catalog is profusely illustrated and contains also a partial list of users.
Examples of Theaters and Theater Roofs. Brochure, 16 pps., 8½ x 11 ins., Illustrated. Contains views of theaters designed by some of the country's leading architects.
Federal Interlocking Tile and Glass Tile. 4 pp., 8½ x 11 ins. Illustrates and describes complete roof or precast concrete slabs requiring no composition covering.

Heinz Roofing Tile Co., 1925 West Third Avenue, Denver, Colo.
Plymouth-Shingle Tile with Sprocket Hips. Leaflet, 8½ x 11 ins. Illustrated. Shows use of English shingle tile with special hips.
Italian Promenade Floor Tile. Folder, 2 pp., 8½ x 11 ins. Illustrated. Floor tiling adapted from that of Davanzati Palace.
Mission Tile. Leaflet, 8½ x 11 ins. Illustrated. Tile such as are used in Italy and Southern California.
Georgian Tile. Leaflet, 8½ x 11 ins. Illustrated. Tiling as used in old English and French farmhouses.

Johns-Manville Corporation, New York.
The New Book of Roofs. Brochure, 24 pp., 8½ x 11 ins. Illustrated. Roofing from the Architect's point of view.

Ludowici-Celadon Company, 104 So. Michigan Ave., Chicago, Ill.
"Ancient" Tapered Mission Tiles. Leaflet, 8½ x 11 ins., 4 pp. Illustrated. For architects who desire something out of the ordinary this leaflet has been prepared. Describes briefly the "Ancient" Tapered Mission Tiles, hand-made with full corners and designed to be applied with irregular exposures.

Milwaukee Corrugating Co., Milwaukee.
Milcor Architectural Sheet Metal Guide. Booklet. 72 pp., 8½ x 11 ins. Illustrated. Metal tile roofing, skylights, ventilators, etc.
Milcor Sheet Metal Handbook. Brochure. 128 pp., 8½ x 11 ins. Illustrated. Deals with rain-carrying equipment, etc.

Structural Gypsum Corporation, Linden, N. J.
Relative Effectiveness of Various Types of Roofing Construction in Preventing Condensation of the Under Surface. Folder, 4 pp., 8¾ x 11 ins. Important data on the subject.
Gypsteel Pre-cast Fireproof Roofs. Booklet, 48 pp., 8½ x 11 ins. Illustrated. Information regarding a valuable type of roofing.

U. S. Gypsum Co., Chicago, Ill.
Pyrobar Roof Construction. Booklet, 8 x 11 ins., 48 pp. Illustrated. Gives valuable data on the use of tile in roof construction.
Sheetrock Pyrofill Roof Construction. Folder, 8½ x 11 ins. Illustrated. Covers use of roof surfacing which is poured in place.

SCHOOL EQUIPMENT

John Van Range Co., Cincinnati.
Practical Planning for School Service. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

SEWAGE DISPOSAL

Kewanee Private Utilities, 442 Franklin St., Kewanee, Ill.
Specification Sheets. 7¾ x 10¾ ins., 40 pp. Illustrated. Detailed drawings and specifications covering water supply and sewage disposal systems.

Nash Engineering Company, South Norwalk, Conn.
Bulletin 67. Booklet. 16 pp. 10¾ x 7½ ins. Illustrated in color. Describes Type A Jennings Sewage Ejector for handling Unscreened sewage and raising it from basements below sewer level.
Bulletin 103. Brochure. 16 pp. 10¾ x 7½ ins. Illustrated in color. Deals with small size Type B Jennings Sewage Ejector.

SCREENS

American Brass Co., The, Waterbury, Conn.
Facts for Architects About Screening. Illustrated folder, 9½ x 11¾ ins., giving actual samples of metal screen cloth and data on fly screens and screen doors.

REQUEST FOR CATALOGS

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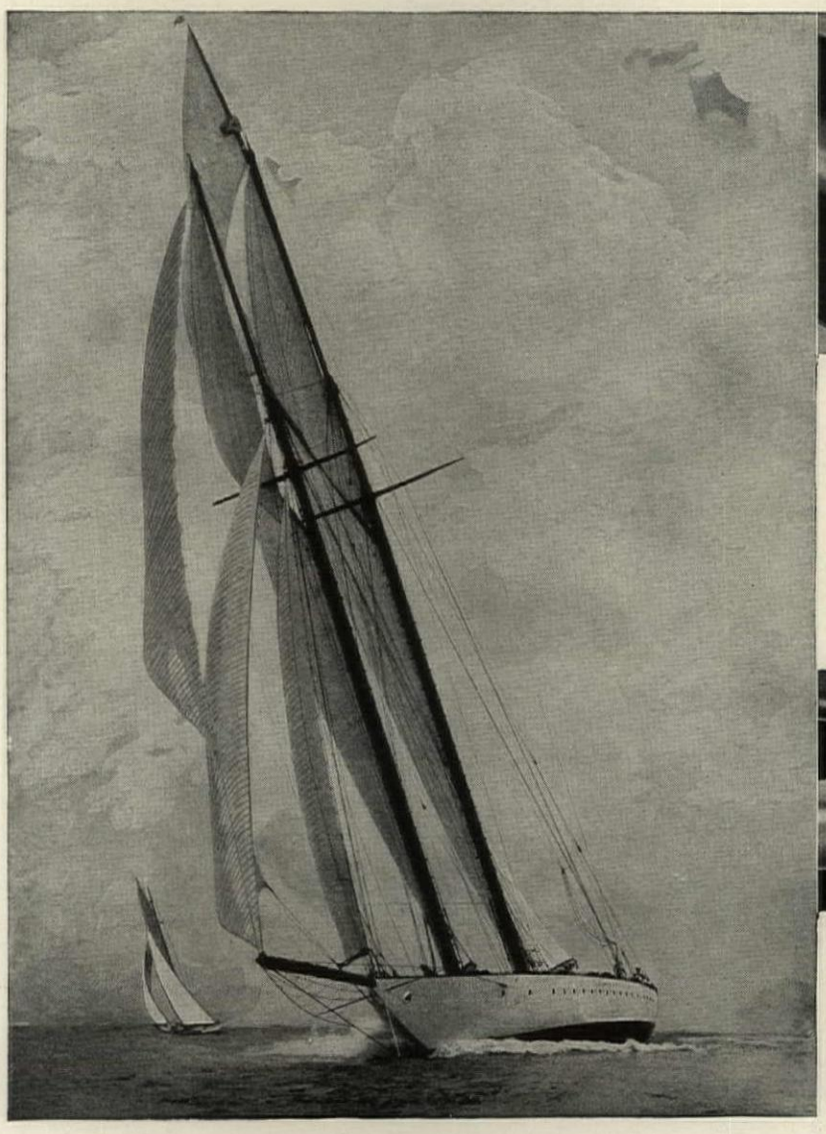
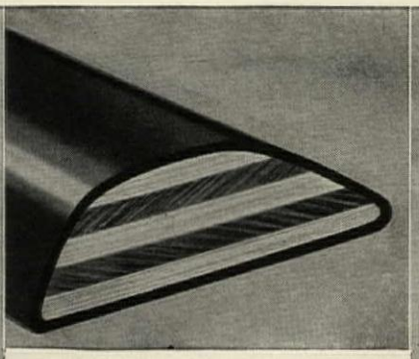
Racing Spars... and Whale-bone-ite





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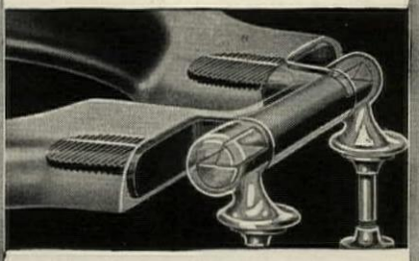

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Cincinnati	Nashville	Washington
Cleveland	Newark	Montreal
Dallas	New Haven	Ottawa
Denver	New Orleans	Toronto
Des Moines	New York	Havana
Detroit	Philadelphia	Buenos Aires

Adelaide, Australia Sidney, Australia
Johannesburg, South Africa

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 196*

SCREENS—Continued

Athey Company, 6015 West 65th St., Chicago, Ill.
The Athey Perennial Window Shade. An accordion pleated window shade, made from translucent Herringbone woven Coutil cloth, which raises from the bottom and lowers from the top. It eliminates awnings, affords ventilation, can be dry-cleaned and will wear indefinitely.

Orange Screen Co., Maplewood, N. J.
Orsco Aluminum Screens. Booklet, 8 pp., 8 x 11 ins. Illustrated. Data on a valuable line of screens.
Orsco Screens and Other Products. Brochure, 20 pp., 8 x 11 ins. Illustrated. Door and window screens and other hardware.

SHADE CLOTH AND ROLLERS

Columbia Mills, Inc., 225 Fifth Avenue, New York, N. Y.
Window Shade Data Book. Folder, 28 pp., 8½ x 11 ins. Illustrated.

SHELVING-STEEL

David Lupton's Sons Company, Philadelphia, Pa.
Lupton Steel Shelving. Catalog E. Illustrated brochure, 40 pp., 8⅝ x 11 ins. Deals with steel cabinets, shelving, racks, doors, partitions, etc.

STEEL PRODUCTS FOR BUILDING

Bethlehem Steel Company, Bethlehem, Pa.
Steel Joists and Stanchions. Booklet, 72 pp., 4 x 6¾ ins. Data for steel for dwellings, apartment houses, etc.

Steel Frame House Company, Pittsburgh, Pa. (Subsidiary of McClintic-Marshall Corp.)
Steel Framing for Dwellings. Booklet, 16 pp., 8½ x 11 ins. Illustrated.
Steel Framing for Gasoline Service Stations. Brochure, 8 pp., 8½ x 11 ins. Illustrated.
Steel Frame Standard Gasoline Service Stations. Booklet, 8 pp., 8½ x 11 ins. Illustrated. Three standard designs of stations.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
The Arc Welding of Structural Steel. Brochure, 32 pp., 8½ x 11 ins. Illustrated. Deals with an important structural process.

STONE, BUILDING

Indiana Limestone Company, Bedford, Ind.
Volume 3, Series A-3. Standard Specifications for Cut Indiana Limestone work, 8½ x 11 ins., 56 pp. Containing specifications and supplementary data relating to the best methods of specifying and using this stone for all building purposes.
Volume 1. Series B. Indiana Limestone Library, 6 x 9 ins., 36 pp. Illustrated. Giving general information regarding Indiana Limestone, its physical characteristics, etc.
Volume 4. Series B. Booklet. New Edition, 8½ x 11 ins., 64 pp. Illustrated. Indiana Limestone as used in Banks.
Volume 5. Series B. Indiana Limestone Library. Portfolio, 11⅛ x 8¾ ins. Illustrated. Describes and illustrates the use of stone for small houses with floor plans of each.
Volume 6. Series B. Indiana Limestone School and College Buildings. 8½ x 11 ins., 80 pp. Illustrated.
Volume 12. Series B. Distinctive Homes of Indiana Limestone. 8½ x 11 ins., 48 pp. Illustrated.
Old Gothic Random Ashlar. 8½ x 11 ins., 16 pp. Illustrated.

STORE FRONTS

Brasco Manufacturing Co., 5025-35 South Wabash Ave., Chicago, Ill.
Catalog No. 33. Series 500. All-Metal Construction. Brochure, 20 pp., 8½ x 11 ins. Illustrated. Deals with store fronts of a high class.
Catalog No. 34. Series 202. Standard construction. Booklet, 16 pp. 8½ x 11 ins. Illustrated, complete data on an important type of building.
Detail Sheets. Set of seven sheets, 8½ x 11 ins., printed on tracing paper, giving full-sized details and suggestions for store front designs.
Davis Solid Architectural Bronze Sash. Set of six sheets, 8½ x 11 ins., printed on tracing paper. Full-sized details and suggestions for designs of special bronze store front construction.

The Kawneer Company, Niles, Mich.
Catalog M, 1929 Edition, 64 pages, 8½ x 11 ins., with the A.I.A. File No., profusely illustrated. General Catalog.
Detail Sheet and descriptive folder, 8½ x 11 ins., with A.I.A. File No. featuring "B" Store Front Construction, designed along modernistic lines.

STORE FRONTS—Continued

Modern Bronze Store Front Co., Chicago Heights, Ill.
Introducing Extruded Bronze Store Front Construction. Folder, 4 pp., 8½ x 11 ins. Illustrated. Contains full-sized details of metal store fronts.

Zouri Drawn Metals Company, Chicago Heights, Ill.
Zouri Safety Key-Set Store Front Construction. Catalog, 8½ x 10½ ins., 60 pp. Illustrated. Complete information with detailed sheets and installation instructions convenient for architects' files.
International Store Front Construction. Catalog, 8½ x 10 ins., 70 pp. Illustrated. Complete information with detailed sheets and installation instructions convenient for architects' files.
Store Fronts by Zouri. Booklet, 30 pp., 9 x 12 ins. Illustrated.

TELEPHONE SERVICE ARRANGEMENTS

All Bell Telephone Companies. Apply nearest Business Office, or American Telephone and Telegraph Company, 195 Broadway, New York.
Planning for Home Telephone Conveniences. Booklet, 52 pp., 8½ x 11 inches. Illustrated.
Planning for Telephones in Buildings. Brochure, 74 pp., 8½ x 11 inches. Illustrated.

TERRA COTTA

National Terra Cotta Society, 19 West 44th St., New York, N. Y.
Standard Specifications for the Manufacture, Furnishing and Setting of Terra Cotta. Brochure, 8½ x 11 ins., 12 pp. Complete Specification, Glossary of Terms Relating to Terra Cotta and Short Form Specification for incorporating in Architects' Specification.
Color in Architecture. Revised Edition. Permanently bound volume, 9⅛ x 12¼ ins., containing a treatise upon the basic principles of color in architectural design, illustrating early European and modern American examples. Excellent illustrations in color.
Present Day Schools. 8½ x 11 ins., 32 pp. Illustrating 42 examples of school architecture with article upon school building design by James O. Betelle, A. I. A.
Better Banks. 8½ x 11 ins., 32 pp. Illustrating many banking buildings in terra cotta with an article on its use in bank design by Alfred C. Bossom, Architect.

TILE, HOLLOW

National Fire-Proofing Co., 250 Federal Street, Pittsburgh, Pa.
Natco. The Complete line of Structural Clay Tile. Booklet. 39 pp. 8½ x 11 ins. Illustrated. A General Catalog.
Natco Double Shell Load Bearing Tile Bulletin. 8½ x 11 ins., 6 pp. Illustrated.
Natco Header Backer Tile Bulletin. 8½ x 11 ins., 4 pp. Illustrated.
Natco Face Tile for the Up-to-Date. Farm Bulletin. 8½ x 11 ins.
Natco Unibacker Tile Bulletin. 8½ x 11 ins., 4 pp. Illustrated.
Natcoflor Bulletin. 8½ x 11 ins., 6 pp. Illustrated.

TILES

Hanley Company, Bradford, Pa.
Hanley Quarry Tile. Folder. 4 pp., 5 x 8 ins. Illustrated.

C. Pardee Works, 9 East 45th St., New York, N. Y., and 1600 Walnut St., Philadelphia, Pa.
Pardee Tiles. Bound volume, 48 pp., 8½ x 11 ins. Illustrated.

United States Quarry Tile Co., Parkersburg, W. Va.
Quarry Tiles for Floors. Booklet, 120 pp., 8½ x 11 ins. Illustrated. General catalog. Details of patterns and trim for floors.
Art Portfolio of Floor Designs. 9¼ x 12¼ ins. Illustrated in colors. Patterns of quarry tiles for floors.

VALVES

Crane Co., 836 S. Michigan Ave., Chicago, Ill.
No. 51. General Catalog. Illustrated. Describes the complete line of the Crane Co.

C. A. Dunham Co., 450 East Ohio St., Chicago, Ill.
The Dunham Packless Radiator Valve. Brochure, 12 pp., 8 x 11 ins. Illustrated. Data on an important type of valve.

Jenkins Brothers, 80 White Street, New York.
Office Buildings Yesterday and Today. Folder, 8½ x 11 ins. Illustrated. Valves for use in office buildings.
The Valve Behind a Good Heating System. Booklet, 4½ x 7¼ ins., 16 pp. Color plates. Description of Jenkins Radiator Valves for steam and hot water, and brass valves used as boiler connections.
Jenkins Valves for Plumbing Service. Booklet, 4½ x 7¼ ins. 16 pp. Illustrated. Description of Jenkins Brass Globe, Angle Check and Gate Valves commonly used in home plumbing, and Iron Body Valves used for larger plumbing installations.

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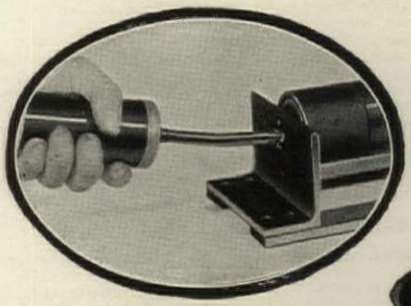

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Philadelphia Office, 2401 Chestnut St.
San Francisco Office, 4401 San Bruno Ave.
Seattle Office, 321 Lumber Ex. Bldg.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 198*

VENETIAN BLINDS

Burlington Venetian Blind Co., Burlington, Vt.
Venetian Blinds. Booklet, 7 x 10 ins., 24 pp. Illustrated. Describes the "Burlington" Venetian blinds, method of operation, advantages of installation to obtain perfect control of light in the room.

Columbia Mills, Inc., 225 Fifth Ave., New York.
Columbia Venetian Blinds. Booklet, 6 pp., 8½ x 11 ins. Illustrated. Complete data and specifications.

VENTILATION

American Blower Co., Detroit, Mich.
American H. S. Fans. Brochure, 28 pp., 8½ x 11 ins. Data on an important line of blowers.

Duriron Company, Dayton, Ohio.
Acid-proof Exhaust Fans. Folder, 8 x 10½ ins., 8 pp. Data regarding fans for ventilation of laboratory fume hoods.
Specification Form for Acid-proof Exhaust Fans. Folder, 8 x 10½ ins.

Staynew Filter Corporation, Rochester, N. Y.
Protectomotor High Efficiency Industrial Air Filters. Booklet, 20 pp., 8½ x 11 ins. Illustrated. Data on valuable detail of apparatus.

WATERPROOFING

Master Builders Company, Cleveland, Ohio.
Waterproofing and Dampproofing and Allied Products. Sheets in loose index file, 9 x 12 ins. Valuable data on different types of materials for protection against dampness.
Waterproofing and Dampproofing File. 36 pp. Complete descriptions and detailed specifications for materials used in building with concrete.

Minwax Company, Inc., 11 West 42nd St., New York.
Waterproofing Stadia. Folder, 4 pp., 8½ x 11 ins. Illustrated.
Transparent Waterproofings for All Masonry Walls and Surfaces. Folder, 4 pp., 8½ x 11 ins. Illustrated.
Data Sheet on Membrane Waterproofing. Folder, 4 pp., 8½ x 11 ins. Illustrated.

Sommers & Co., Ltd., 342 Madison Ave., New York, N. Y.
"Permantile Liquid Waterproofing" for making concrete and cement mortar permanently impervious to water. Also circulars on floor treatments and cement colors. Complete data and specifications. Sent upon request to architects using business stationery. Circular size, 8½ x 11 ins.

Sonneborn Sons, Inc., L., 116 Fifth Ave., New York, N. Y.
Pamphlet, 3¾ x 8¾ ins., 8 pp. Explanation of waterproofing principles. Specifications for waterproofing walls, floors, swimming pools and treatment of concrete, stucco and mortar.

Toch Brothers, New York, Chicago, Los Angeles.
Architects' Specification Data. Sheets in loose leaf binder, 8½ x 11 ins., dealing with an important line of materials.

WEATHER STRIPS

Athey Company, 6035 West 65th St., Chicago, Ill.
The Only Weatherstrip with a Cloth to Metal Contact. Booklet, 16 pp., 8½ x 11 ins. Illustrated. Data on an important type of weather stripping.

WINDOWS

Detroit Steel Products Co., 2250 E. Grand Boulevard, Detroit.
Fenestra Blue Book. Brochure, 75 pp., 8½ x 11 ins. Illustrated. Data on steel windows.

The Kawneer Company, Niles, Mich.
Circular, 8½ x 11 with A.I.A. File No. featuring full size details and specifications of Heavy Type Sealair Independent Balanced Sash Window.
Circular, 8½ x 11 with A.I.A. File No. featuring full size details and specifications of Light Independent Balanced Sash Sealair Windows.
Circular, 8½ x 11 with A.I.A. File No. featuring full size details and specifications of In-swinging Sash Sealair Windows. The above to be furnished in non-ferrous metal and steel.

David Lupton's Sons Company, Philadelphia, Pa.
Lupton Pivoted Sash. Catalog 12-A. Booklet, 48 pp., 8½ x 11 ins. Illustrates and describes windows suitable for manufacturing buildings.
Lupton Commercial Projected Windows. Brochure. 24 pp., 8½ x 11 ins. Illustrated. Details and specifications.

WINDOWS, CASEMENT

Detroit Steel Products Co., 2250 E. Grand Boulevard, Detroit.
Fenestra Casements. Booklet, 14 pp., 8½ x 11 ins. Illustrated. Discusses casements, particularly for residences.
Fenestra Screen Casements. Brochure, 16 pp., 8½ x 11 ins. Illustrated.
Decorating With Casements. Booklet, 18 pp., with inserts in color 6 x 8½ ins. Deals with use of decorations, particularly draperies, with casement windows.

WINDOWS, CASEMENT—Continued

Hope & Sons, Henry, 103 Park Ave., New York, N. Y.
Catalog, 12¾ x 18½ ins., 30 pp. Illustrated. Full-size details of outward and inward opening casements.

David Lupton's Sons Company, Philadelphia, Pa.
Lupton Casement of Copper Steel. Catalog C-217. Booklet, 24 pp., 8⅝ x 11 ins. Illustrated brochure on casements, particularly for residences.
Lupton Creates a Complete Casement. Folder, 8½ x 11 ins. Illustrated data on a casement providing for screens, shades and draperies.
Lupton Heavy Casements. Detail Sheet No. 101, 4 pp., 8½ x 11 ins. Details and specifications only.

Richards-Wilcox Mfg. Co., Aurora, Ill.
Casement Window Hardware. Booklet, 24 pp., 8½ x 11 ins. Illustrated. Shows typical installations, detail drawings, construction details, blue-prints if desired. Describes AIR-way Multifold Window Hardware.
Architectural Details. Booklet, 8½ x 11 ins., 16 pp. Tables of specifications and typical details of different types of construction.
List of Parts for Assembly. Booklet, 8½ 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., 8½ x 11 ins. Illustrated.

Orange Screen Company, Maplewood, N. J.
New Vogue Aluminum Frame Screens. Booklet, 12 pp., 3½ x 8½ ins. Illustrated.

WINDOW SHADES AND ROLLERS

Columbia Mills, Inc., 225 Fifth Avenue, New York, N. Y.
Window Shade Data Book. Folder, 28 pp., 8½ x 11 ins. Illustrated.
Window Shade Rollers. Brochure, 24 pp., 8 x 11 ins. Illustrated. Rollers and accessories.

WINDOWS, STEEL AND BRONZE

David Lupton's Sons Company, Philadelphia, Pa.
A Rain-shed and Ventilator of Glass and Steel. Pamphlet, 4 pp., 8½ x 11 ins. Deals with Pond Continuous Sash. Sawtooth Roofs, etc.
How Windows Can Make Better Homes. Booklet, 3⅞ x 7 ins., 12 pp. An attractive and helpful illustrated publication on use of steel casements for domestic buildings.

Truscon Steel Company, Youngstown, Ohio.
Drafting Room Standards. Book, 8½ 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.
Truscon Solid Steel Double-Hung Windows. 24 pp. Booklet, 8½ x 11 ins. Containing illustrations of buildings using this type of window. Designs and drawings of mechanical details.
Continuous Steel Windows and Mechanical Operators. Catalog 126. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

WOOD—See also Millwork

American Walnut Mfrs. Association, 618 So. Michigan Boulevard, Chicago, Ill.
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 Paneling. 7 x 9 ins. Illustrated. Discusses interior woodwork, giving costs, specifications of a specimen room, the different figures in Walnut wood, Walnut floors, finishes, comparative tests of physical properties and the advantages of American Walnut for woodwork.

Curtis Companies Service Bureau, Clinton, Iowa.
Curtis Cabinet and Stair Work. Booklet, 47 pp., 7¾ x 10½ ins. Illustrated.
Curtis Windows. Brochure, 7¾ x 10½ ins. Illustrated.
Curtis Interior Doors. Booklet, 7¾ x 10½ ins. Illustrated.
Curtis Entrances and Exterior Doors. Brochure, 7¾ x 10½ ins. Illustrated.

National Lumber Mfrs. Assn., Washington, D. C.
Airplane Hangar Construction. Booklet, 24 pp., 8½ x 11 ins. Use of lumber for hangars.
Modern Home Interiors. Booklet, 8½ x 11 ins. Illustrated. Deals with interior uses of wood.

WOOD FINISH

Minwax Company, Inc., 11 West 42nd St., New York.
Color card and specification for Minwax Flat Finish. Folder, 4 pp., 8½ x 11 ins. Illustrated. Deals with a penetrative, preservative stain finish giving stain and soft wax effect.

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Changes these figures to apply to your client's business, and there, in a nutshell, you have the most conspicuous advantage of Strowger P-A-X.

No matter if the specifications call for five telephones or thousands there is a P-A-X which will meet the requirements efficiently, putting every individual and every department within easy reach of each other.

Two or three turns of the P-A-X telephone dial—automatically and instantly the connection is made. As a saver of time and steps in transmitting information within any organization nothing can take the place of Strowger P-A-X.

More than two thousand concerns in every conceivable line of business, whose needs range from four or five telephones to several thousand, find Strowger P-A-X indispensable. You are invited to call upon Strowger engineers in connection with any project calling for interior telephone equipment. They will be glad to make studies and submit estimates entirely without cost or obligation.

STROWGER AUTOMATIC DIAL SYSTEMS

Public Automatic Telephone and Signalling Systems
Private Automatic Telephone Systems—(Strowger P-A-X)
Code Signal Systems (Audible and Visual) **Fire Alarm Systems**
Tele-Chec Systems (for theatres) **Watchmen's Supervisory Systems**
Railway Communication Equipment **Marine Telephone & Signalling Systems**
Miscellaneous Telephone and Signal Accessories.

Engineered, Designed and Manufactured by

Automatic Electric Inc.

Factory and General Offices:
1033 West Van Buren St., Chicago, U. S. A.

Sales and Service Offices:

Los Angeles	Cleveland	New York	Dallas	Kansas City
Boston	St. Paul	Atlanta	Detroit	Philadelphia

General Export Distributors:
The Automatic Electric Company, Ltd., Chicago

In Canada . **Independent Sales & Engineering Co., Ltd.: Vancouver**
In Australasia . . . . . **Automatic Telephones, Ltd.; Sydney**
In Japan . . . . . **Automatic Telephones Ltd. of Japan, Tokyo**

Associated Companies:
American Electric Company, Inc.. . . . . Chicago
International Automatic Telephone Company, Ltd. . London
Automatic Telephone Manufacturing Company, Ltd. Liverpool
The New Antwerp Telephone & Electrical Works . . Antwerp

In answer to the modern vogue for color the popular Monophone may now be had, not only in black, but also in a variety of beautiful colors. Made of solid colored bakelite, with chromium or gold plated fittings.

The Marshall Field Garden Homes as they appear in a bird's-eye view. Andrew J. Thomas, Architect, New York City; Graham, Anderson, Probst & White, Associate Architects, Chicago.

THE 628 KITCHENS IN THE Marshall Field Garden Apartment Homes are equipped with FRIGIDAIRE

A letter from Mr. Rosenthal

"We are enclosing signed copies of a contract for six hundred twenty-eight (628) Frigidaires for the Marshall Field Garden Apartment Homes.

"As you know, this is a non-profit project, providing apartments to rent at cost. Because of this, we are particularly concerned not only as to the quality and character of the equipment, but the operating and maintenance cost, that the occupants of these apartments may have the very best possible service at the lowest possible cost."

Yours very truly,
O. W. Rosenthal—Cornell Co.,
O. W. Rosenthal, President

Wherever used, Frigidaire saves so much money and food, and costs so little to operate, that more have been sold than all other electric refrigerators combined.

And today Frigidaire offers as an added feature the famous "Cold Control"—a patented device for providing extra cold temperatures for speeding the freezing of ice cubes, and making new varieties of frozen delicacies.

Let us send you complete information about Frigidaire—the low prices—General Motors liberal terms. Write today. Frigidaire Corporation, Subsidiary of General Motors Corporation, Dayton, Ohio.

Frigidaire Corporation, Department A-211, Dayton, Ohio. Please send me, free, complete literature especially prepared for the architect and builder.

Name..... Address.....

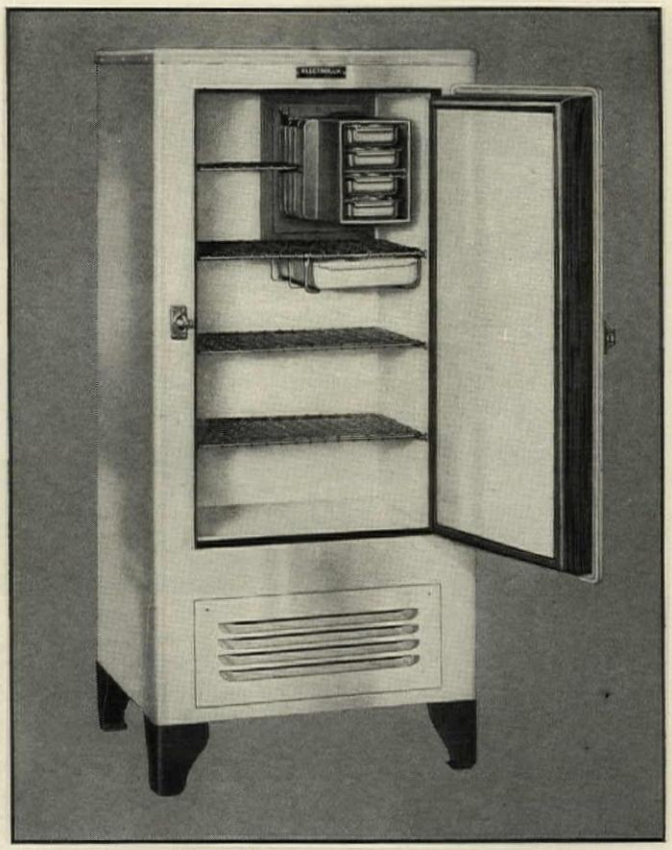
SPECIFY ELECTROLUX *because it is* NOISELESS

Unique advantages . . . conspicuous success of Electrolux Gas Refrigeration has won confidence

ARCHITECTS everywhere are specifying this most modern of all refrigerating systems for up-to-date apartments. From California we hear that noiseless Gas Refrigeration means faster rentals. From Chicago come reports of fewer tenant complaints in Electrolux-equipped buildings. The South writes of the economy and lack of need for service of Gas Refrigeration. And from metropolitan New York, the hardest market in the world, we get amazing figures. 20,859 Electrolux refrigerators installed in apartments alone in but nine short months! It's hardly surprising that the newest and finest of apartments insist on Electrolux Gas Refrigeration. The public has accepted it with enthusiasm.

Unique advantages

Electrolux has no machinery . . . no moving parts. This means that there is never the slightest whisper of sound to irritate and dissatisfy tenants. And it means there are no belts, fans or compressors to wear out and run up annoying service bills. A tiny gas flame is the whole "works" of the Gas Refrigerator. Furthermore, Electrolux is the cheapest to operate of all refrigerating systems.



Kitchenette Model Electrolux is ideal for the small family. Food capacity—4 cu. ft., 36 large ice cubes between meals.

Write today for full information about Electrolux Gas Refrigeration . . . the many different models for apartments and houses . . . the lovely color harmonies. Servel Sales, Inc., Evansville, Indiana.

ELECTROLUX

THE *Gas* REFRIGERATOR

A tiny gas flame takes the place of all moving parts.

FASHIONABLE APARTMENTS EVERYWHERE are being equipped with the newest and finest refrigerator... Electrolux. The one shown here is the Hudson Gables in New York City.

9 out of 10 Modern Hotels have *Monel Metal* equipped kitchens

-CHATEAU V ORLEANS
HOTEL STE CINCINNA
HOTEL LEXINGTON, NEW YORK—HOTEL ST. FRANCIS, SAN FRAN
—NEW PALMER HOUSE, CHICAGO—MT. ROYAL, MONTREA
BEN FRANKLIN, PHILADELPHIA—ROYAL HAWAIIAN HOTEL
—LORD BALTIMORE, BALTIMORE—ROYAL YORK, TORONT
IOTEL ROOSEVELT, NEW ORLEANS—OLYMPIC HOTEL, SEATTLE
NICCOLET HOTEL, MINNEAPOL GOVERNOR CLINTON,
BAKER HOTEL, DALLAS LORD NELSON, HAL
BROWN HOTEL, LOUISVILLE OTEL BARCLAY, PHI
OTEL PRESIDENTE, HAVANA—ARIZONA-BILTMORE, PHOENIX

This preference should carry weight with Architects.....

IF you have made a study of modern hotels—those built in the last decade—you have found that most of them have Monel Metal food service equipment.

Hotel owners and operators expect to have architects specify Monel Metal...because this silvery alloy has become the standard material of construction for high quality food service equipment.

Those who have used it—in hotels, restaurants, or home kitchens—have learned from actual experience that Monel Metal stays bright and clean through years of hard service. Users like its beautiful, silvery appearance—its remarkable cleanability—its durability and economy.

Monel Metal will not rust. It resists corrosion. It has no coating to chip, crack or wear off. Monel Metal's lustrous surface can be kept spotlessly clean with very little care. Consequently, this Nickel alloy is recognized as the ideal material for kitchen equipment—in hotels, restaurants, hospitals, institutions ...and homes.

Since Monel Metal's national advertising always directs the reader to the architect, it is important that you have in your file complete information on Monel Metal.

MONEL METAL
MODERN AS TOMORROW

INCO MONEL METAL

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York, N.Y.

Monel Metal is a technically controlled Nickel-Copper alloy of high Nickel content. It is mined, smelted, refined, rolled and marketed solely by The International Nickel Company, Inc. The name "Monel Metal" is a registered trade mark.

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

Please send me literature describing the use of Monel Metal for

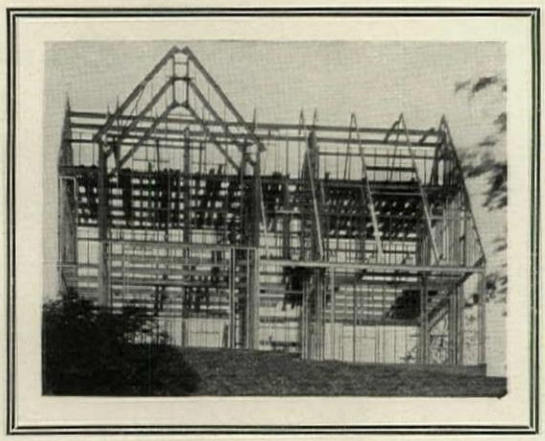
☐ Food Service Equipment
☐ Home Kitchen Equipment

Name _____

Address _____

Company _____

What Else
Do you want to know *about* This Construction?



I

QUESTION: What is Steel Framing?

ANSWER: A light structural steel framework for constructing homes.

II

QUESTION: What kind of homes?

ANSWER: Every kind—brick, stone, stucco —large or small.

III

QUESTION: Must they be standardized designs?

ANSWER: No! Steel Framing is adaptable to any design or any style of architecture.

IV

QUESTION: How is it made up?

ANSWER: Steel Framing Plans are taken direct from your drawings. Every piece is fabricated at the mill and delivered to the building site ready for immediate erection.

V

QUESTION: (a) How much extra work is there for architects? (b) Builders?

ANSWER: (a) None. (b) None.

VI

QUESTION: Does it require special workmen for erection?

ANSWER: No! Men familiar with home building and with the use of ordinary tools can erect Steel Framing quicker and easier than any other framing.

VII

QUESTION: What materials can be used in completing the structure?

ANSWER: All standardized materials that are used with any other framing.

VIII

QUESTION: What are a few of the definite advantages of Steel Framing.

ANSWER: (1) It is the strongest, most rigid construction in home building. (2) It wards off depreciation and maintains property value. (3) It is firesafe. (4) It is the kind of construction that provides a better and a more comfortable home. (5) It can not shrink or warp.

IX

QUESTION: Will you send specific information on any other question that pertains to Steel Framing?

ANSWER: Yes, gladly. Write to Steel Frame House Company, Oliver Building, Pittsburgh, Pa.

STEEL FRAME HOUSE COMPANY, Oliver Building., Pittsburgh, Pa.

Subsidiary of McClintic-Marshall Corporation

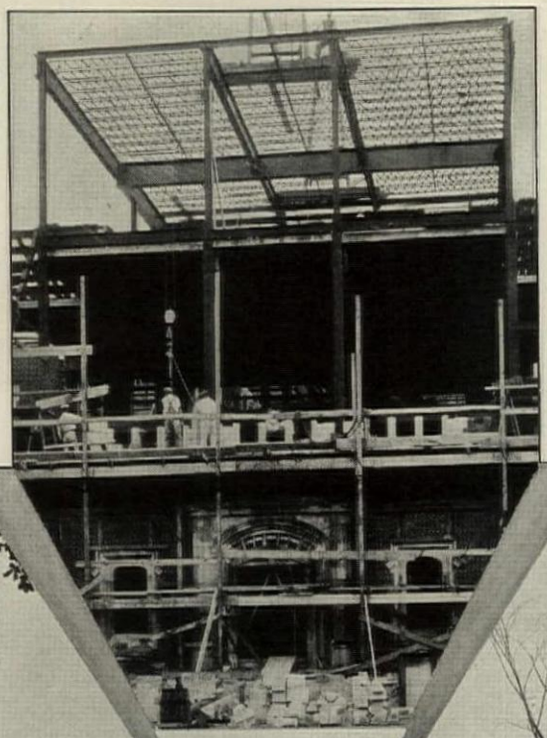
STEEL FRAMING

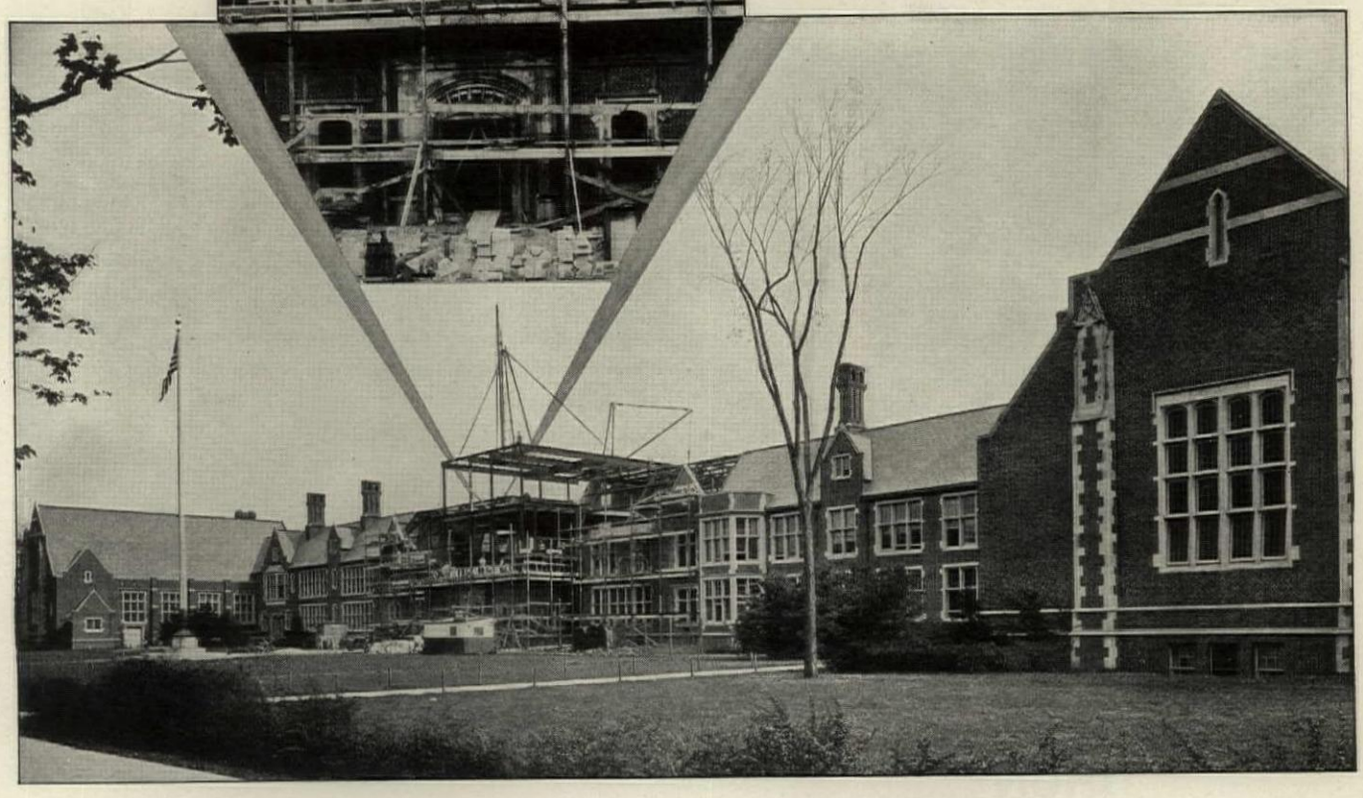
THE MODERN METHOD OF HOUSE CONSTRUCTION

for additions *and* remodeling

HAVEMEYER Trusses can be handled and placed so speedily, easily and with so little temporary structure required, that they are ideal for additions, remodeling and rebuilding. They make possible all the advantages of fireproof construction, yet do not overburden even a small job with heavy preparatory and equipment expenses.

Being available in graduated lengths up to a 31-foot span, no cutting or fabricating is required. Each truss is placed, braced and secured with ordinary labor. Concrete Steel Co., 42 Broadway, New York.





CONCRETE STEEL CO.
Executive Offices: 42 Broadway, New York
District Offices: Birmingham, Boston, Chicago, Detroit, Minneapolis, Philadelphia, Pittsburgh, St. Paul, Syracuse, Washington, Youngstown.

Concrete Steel Co.

TONCAN~a Plaster Reinforcement PLUS! (A metal Lath that resists rust)

Corridor in New York Life Insurance Suite,
New York Life Building, New York City.
CASS GILBERT, *Architect*

WHEN a plaster job assumes the responsibility of period interpretation in ceiling, sidewall, pilaster and arch, the lath specification takes on a new significance.

A plaster reinforcement, expanded from Toncan Copper Molybdenum Iron with its universal acceptance for rust resistance, would, in itself, justify preference. In addition, all Berloy laths have resquared ends, full covering width and the maximum number of strands per square inch to insure plaster economy and strength.

When you specify Toncan, your plaster base exemplifies the modern application of product justification.

A Berloy lath for every purpose.

REG. U. S. PAT. OFF.
TONCAN
COPPER
Mo-lyb-den-um
IRON

METAL LATH

COMPLETE INFORMATION UPON REQUEST

THE BERGER MANUFACTURING CO.

CANTON, OHIO

BRANCHES

Boston	Dallas	Kansas City	New York	Roanoke
Chicago	Detroit	Los Angeles	Philadelphia	San Francisco
Cleveland	Jacksonville	Minneapolis	Pittsburgh	St. Louis

Export Dept.—Canton, Ohio

These modern hotels --and many more

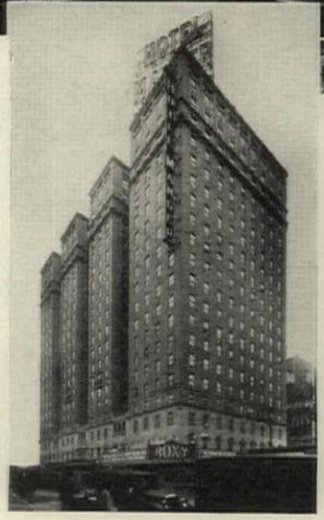
The Sherry-Netherland—*New York*

The Los Angeles-Biltmore

Barlum Hotel and Tower—*Detroit*

Left:
The Mark Hopkins
San Francisco

Above:
The Lord Baltimore
Baltimore



Above:
The Morrison
Chicago

Left:
The Manger
New York

Hotels in every important city of the United States and many foreign countries have Bethlehem Wide-Flange Structural Shapes—generally known as Bethlehem Sections—in their steel framework.

Bethlehem Sections are likewise being extensively used in the framework of industrial buildings, bridges, hangars, apartments, theatres, office and bank buildings, public buildings, and numerous other structures. Architects, engineers and contractors the world over have long recognized the light weight and the economy in cost of fabrication of these Wide-Flange Shapes.

With the introduction, about one year ago, of 33- and 36-inch Sections, Bethlehem further broadened the service of a famous series of shapes. Bethlehem Wide-Flange Structural Shapes—H-Columns, I-Beams and Girder Beams—are being rolled in all popular sizes on regular schedule at the Bethlehem, Pa., and Lackawanna, N. Y., Plants.

BETHLEHEM STEEL COMPANY

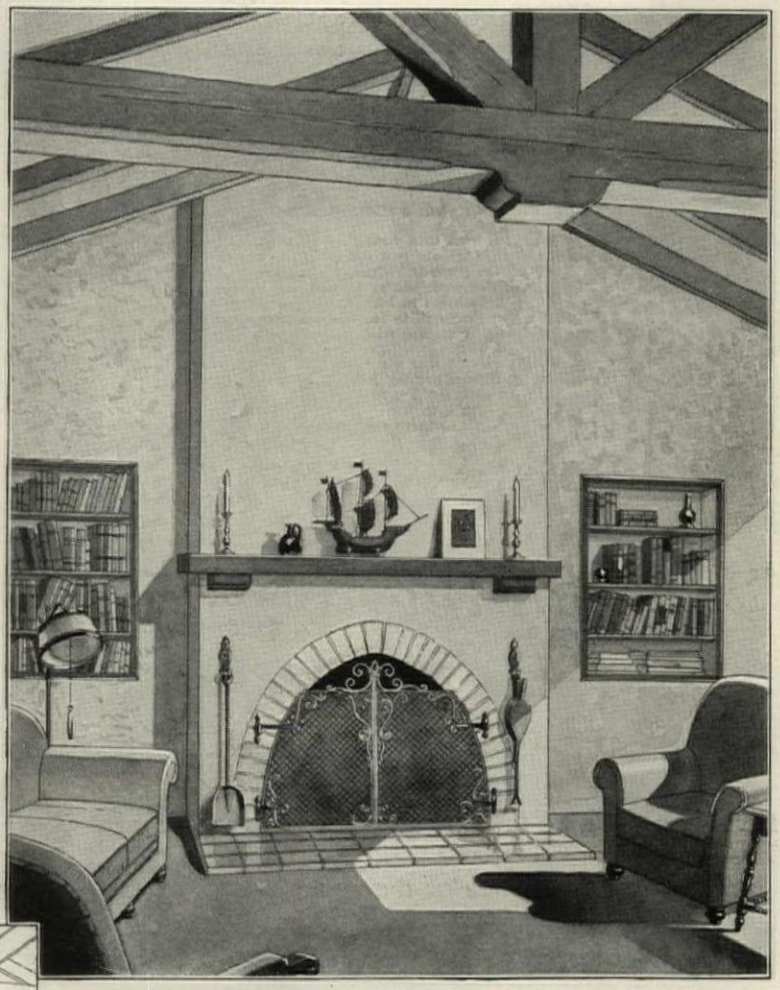
General Offices: Bethlehem, Pa.

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Detroit, Cincinnati, Chicago, St. Louis, San Francisco, Los Angeles, Seattle, Portland, and Honolulu.

Bethlehem Steel Export Corporation, New York City
Sole Exporter of our Commercial Products

BETHLEHEM WIDE-FLANGE STRUCTURAL SHAPES

MILCOR Stay-Rib Metal Lath Provides the Reinforcement That Protects Plastered Walls and Ceilings

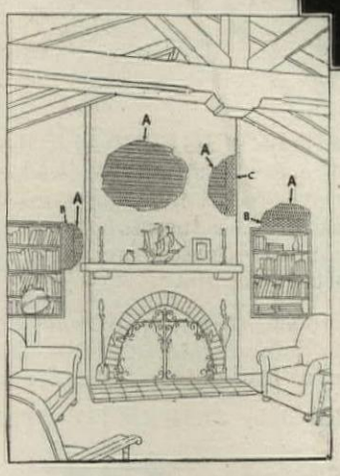


IT is an accepted fact that the plaster base plays the most important part in the protection of beautiful walls and ceilings . . . and it follows logically that the more perfect the plaster base, the greater is the assurance of permanence.

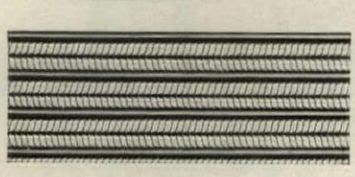
Milcor Stay-Rib Metal Lath is a definite advance in the design of expanded metal plaster bases. It has unusually strong reinforcing longitudinal ribs. It has a mesh design that firmly imbeds the plaster with slight pressure. It provides an adequate key without waste . . . and lastly; it is given additional strength through a special *Milcor* reannealing process.

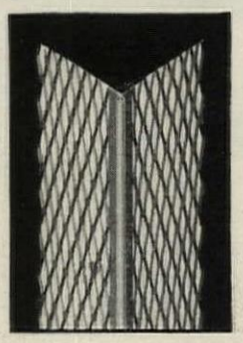
These combined features have made *Milcor* Stay-Rib metal lath the accepted assurance of permanently reinforced walls and ceilings. Architects specify it with utmost confidence. It is one of the famous *Milcor* Fireproof Products which also include *Milcor* Expansion Casing and Corner Bead. Complete information is contained in the *Milcor* Manual.

MILWAUKEE CORRUGATING CO.
1405 Burnham St. Milwaukee

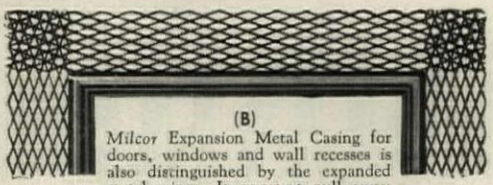


(A)
Milcor Stay-Rib Metal Lath has unusual strength and rigidity. Its design . . . a *Milcor* patent . . . affords the maximum protection against plaster cracks.





(C)
Milcor Expansion Corner Bead is distinguished by its expanded metal wings . . . This feature . . . a *Milcor* patent . . . permits a perfect grip upon the plaster and prevents chipping off from unavoidable abuse.



(B)
Milcor Expansion Metal Casing for doors, windows and wall recesses is also distinguished by the expanded metal wings. It cannot pull away during settlement and will not leave cleavage cracks.

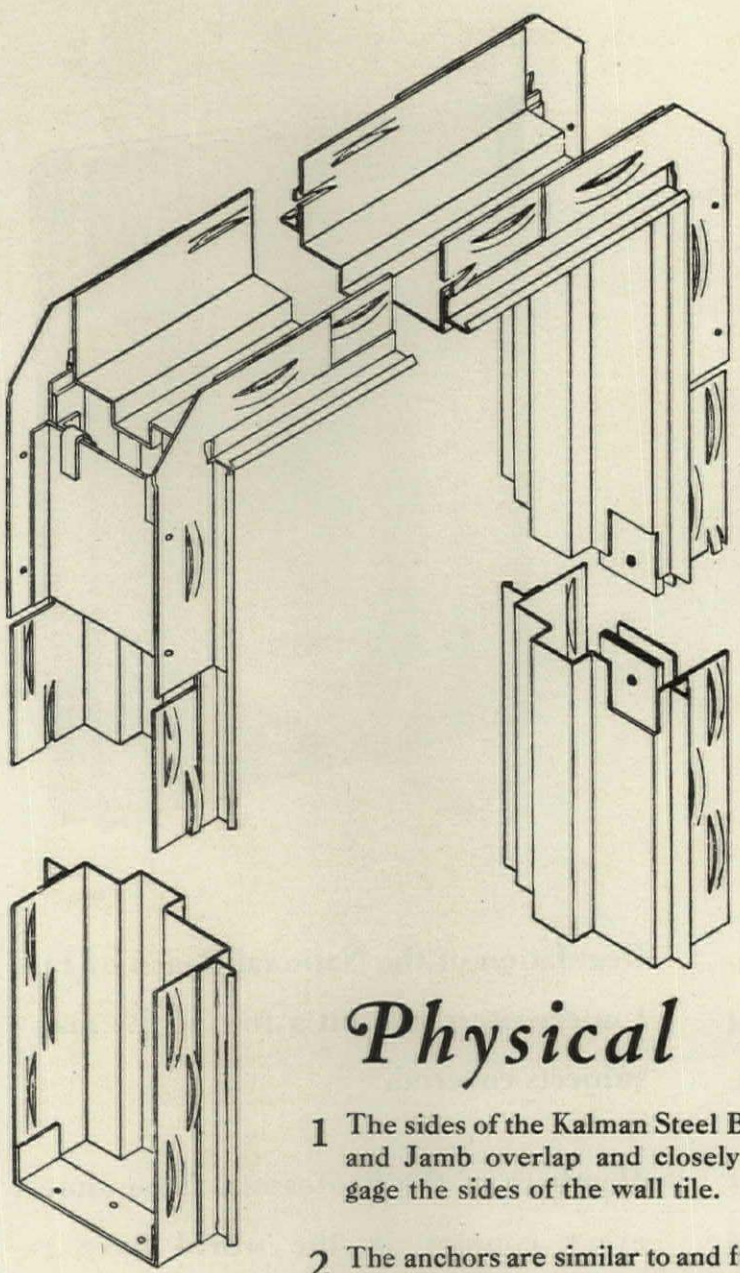
MILCOR
Expanded Metal Building Products are Available in

ARMCO Ingot Iron

Copper Alloy Steel

MILCOR PRODUCTS

Branches: Chicago, Ill., Kansas City, Mo., La Crosse, Wis.
Sales Offices: Boston, Mass., Detroit, Mich., Atlanta, Ga., Little Rock, Ark., Minneapolis, Minn., Los Angeles, Calif.
Eastern Plant: THE ELLER MANUFACTURING CO., *Canton, Ohio*



The IMPROVED STEEL BUCK *and* JAMB

In the Kalman Steel Jamb, form truly follows function.

Kalman Steel Jamb is not made in imitation of wood, but is designed to give steel character as steel and is in keeping with our interpretation of the modern trend of architectural design.

Physical Characteristics

1 The sides of the Kalman Steel Buck and Jamb overlap and closely engage the sides of the wall tile.

2 The anchors are similar to and function like Terra Cotta anchors and are visible where they attach to the Jamb until the wall is plastered, thus their use or omission can be easily verified.

3 The Jamb is supplied with elements which form definite grounds and metallic terminations for the plaster.

4 The sides are expanded into rows of loops which form a mechanical bond and reinforcement for the plaster over a wide area.

5 The plaster passes through the perforations, back of the loops to the sides of the tile.

6 The body of the Jamb is made of specially treated steel and the face is finished with Duco primer. The terminals are made of specially treated galvanized sheets and form a bond at the junction, with the plaster similar to that provided by Corner Bead.

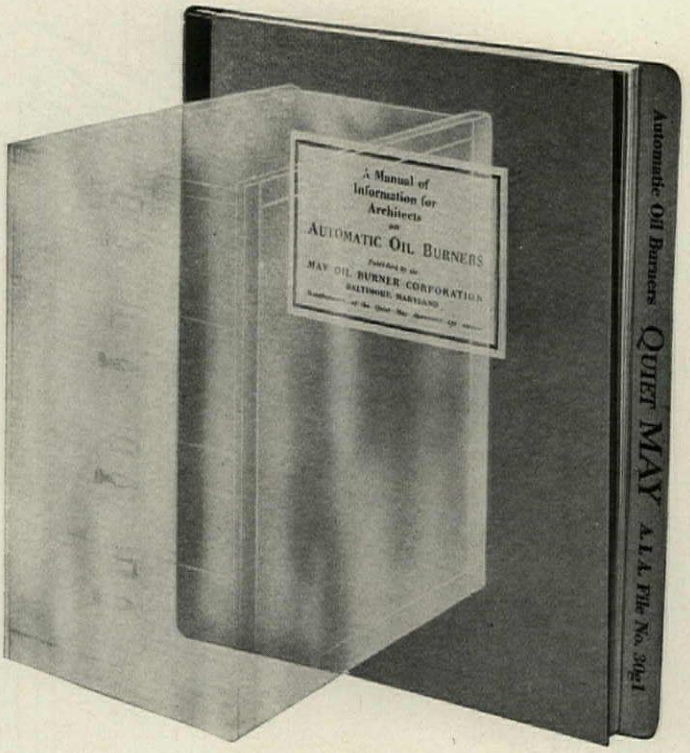
KALMAN STEEL COMPANY

KALMAN STEEL

MODERN, FIRE-SAFE BUILDING PRODUCTS

Atlanta, Baltimore, Boston, Buffalo, Charlotte, Chicago, Cleveland, Columbus, Dallas, Dayton, Detroit, Houston, Milwaukee, Minneapolis, Newark, New Haven, New York (Export Office—New York), Niles, Philadelphia, Pittsburgh, St. Louis, St. Paul, Syracuse, Washington, D. C., Youngstown

A Complete File of Information



Here, bound between the two covers of a book, is an entire filing cabinet of information on oil heating.

This book was published to answer the architect's need for a Manual of Information on Automatic Oil Burners. It thoroughly covers every angle of oil heat.

Basement Floor Plans, Fundamentals of Oil Heat, Boilers, Automatic Control of Oil Burners, Sample Specifications and Regulation of the National Board of Fire Underwriters are but a few of the many subjects covered.

Members of the Profession from almost every country in the world have requested a copy of this Manual for their files.

If you are without one, we will gladly see that you receive a copy of this Manual if you will send us your name and address.

F-12

MAY OIL BURNER CORPORATION
3500 E. BIDDLE ST., BALTIMORE, MD.

MEMBER

Please send your manual of information for architects to

Individual.....

c/o Firm.....

Street.....

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

MAY OIL BURNER CORPORATION
3500 E. BIDDLE STREET
BALTIMORE, MD.

The Dunham Differential Vacuum Heating System

is installed in the Philtower Building Tulsa, Okla.

Conceived and built by
WAITE PHILLIPS
Designed by
KEENE AND SIMPSON
in collaboration with
EDWARD BUEHLER DELK

General Contractors
THE LONG CONSTRUCTION COMPANY
Consulting Engineer
WALTER GILLHAM
Heating Contractors
MACMAHON CO.

Tulsa is proud of the Philtower Building, and justly so. This superb edifice raises its lofty head twenty-eight stories above the street in a magnificent tower that exemplifies the modern setback type of design to the highest degree. It is significant that Mr. Phillips, the owner, and the builders of this structure, consulted with the building planning service of the Building Owners and Managers National Association and gave careful consideration to the association's advice in nearly every detail of construction and arrangement.

It is also significant that the Dunham Differential Vacuum Heating System was selected for the Philtower Building. The owner built into his project not only the finest of equipment, but also selected the type of heating system in which the tenants will find satisfaction from every angle of comfort and health. At the same time he (the owner) secures the utmost in fuel economy. In choosing the Dunham Differential System Mr. Phillips solved the heating problem for his building, just as many hundreds of others have done in similar structures.

Look for the name DUNHAM

This nameplate identifies a genuine Dunham Thermostatic Radiator Trap.

C. A. DUNHAM CO.

Dunham Building, 450 East Ohio Street
CHICAGO, ILLINOIS

Over eighty sales offices in the United States, Canada and the United Kingdom bring Dunham Heating Service as close to you as your telephone. Consult your telephone directory for the address of our office in your city. An engineer will counsel with you on any project.

The Dunham Differential Vacuum Heating System and individual parts of the apparatus used in that system are fully protected by United States Patents Nos. 1,644,114, 1,706,401 and 1,727,965, and Canadian Patents Nos. 282,193, 282,194 and 282,195. Additional patents in the United States, Canada and foreign countries are now pending.

"And it cost *Much Less* than you would Expect"

Whenever conversation turns to the topic of home heating, Electrol owners never fail to express their amazement that Electrol Automatic Oil Heat cost so much less than they expected.

The widespread preference for this finer burner among people to whom price is no consideration, and the generous, enthusiastic praise of users everywhere, give the impression that Electrol's higher quality is high priced. A mistaken idea—as any owner and hundreds of architects will tell you.

Even in modest homes where economy must rule, the greater fuel efficiency, cleanliness, labor-saving convenience, and long, trouble-free service, make Electrol the most acceptable form of heating. Home builders of limited resources find the price surprisingly low. And the first cost is final. No extras come later.

You will find the Electrol dealer will work with you conscientiously to determine accurately Electrol's cost on any job. Likewise, he has some interesting figures to show you on the surprisingly low fuel consumption of Electrol.

A Consultation Service for Architects

Electrol has a staff of engineers who devote their entire time to the formulation of heating plans and specifications from information sent us by architects. Electrol welcomes the opportunity to put this free service at your disposal.

ELECTROL INCORPORATED
227 East 45th St. New York City

ELECTROL

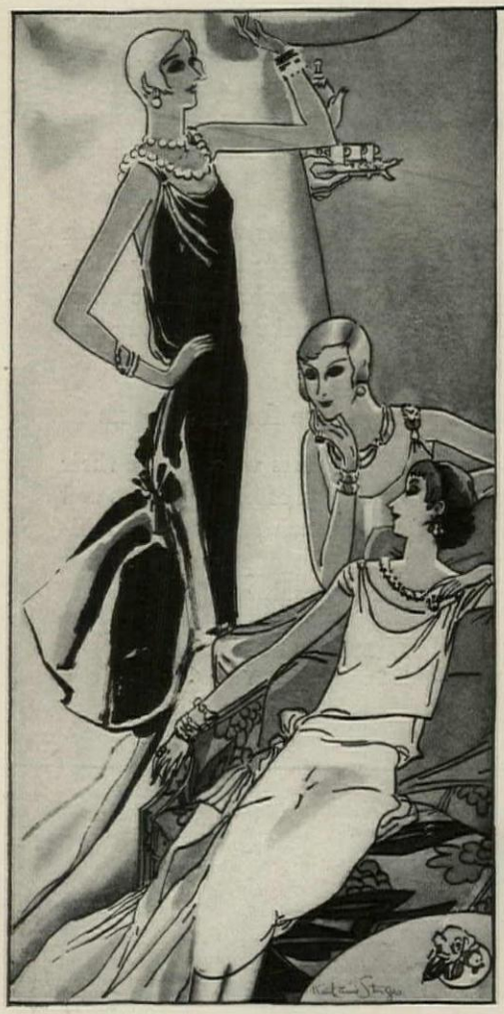
The* OIL BURNER *with the Master Control

LISTED AS STANDARD BY THE UNDERWRITERS' LABORATORIES

MEMBER
OIL HEATING
INSTITUTE

Your client's cheviot suit ... his wife's chiffon frock

— and *the heating specifications*



MODERN woman's scanty raiment brings the need for more heat in homes than is comfortable for wool-clothed men. Yet, even this new condition can be provided for in heating specifications. Many architects and heating engineers are specifying Hoffman Controlled Heat, – the remarkably flexible system created by adding Hoffman Controlled Heat equipment to any standard boiler and radiators, whether oil, gas or coal fired.

The modern secret of Hoffman Controlled Heat lies in its ability to deliver to each room as much or as little heat as its occupant desires, without effect on the temperature of other rooms. The heat output of each radiator is regulated *from the radiator*. Only as the call comes for more heat, does the supply of steam accumulate. There is no waste and therefore an amazingly low fuel consumption.

Hoffman Controlled Heat equipment comprises, (1) Hoffman No. 7 Modulating Valves for radiators, (2) Hoffman Return Line Valves, which automatically open for passage of air and water and close to steam, (3) the Hoffman Damper Regulator which automatically controls the draft, (4) the Hoffman Differential Loop which safeguards the water line of the boiler at all times and, (5) No. 15 Vacuum Valve that vents air and prevents its return to system through the vent port.

A request on your letterhead brings you a copy of the Hoffman Controlled Heat booklet, which explains all details. Address Hoffman Specialty Company, Inc., Dept. **EF 12**, Waterbury, Connecticut.

HOFFMAN CONTROLLED HEAT

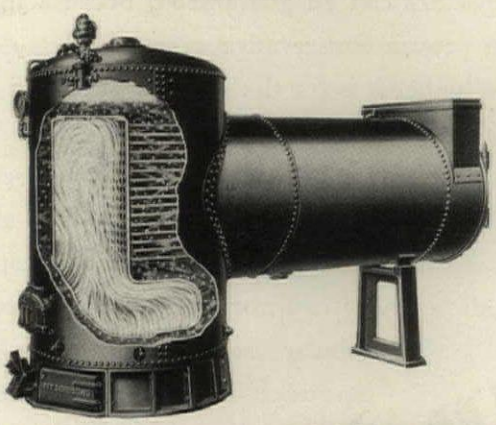
Heating *The Beresford*

THE WORLD'S LARGEST APARTMENT

THE BERESFORD

Architect:—Emery Roth
Heating Contractors:—Raisler Heating Co.
Consulting Engineers:—Eadie, Freund & Campbell
Builders:—H. R. H. Construction Co.

Five Fitzgibbons Steel Boilers, each with a rating of 25,000 sq. ft. radiation, perform with complete satisfaction from every angle, the extremely responsible duty of heating this magnificent apartment structure.



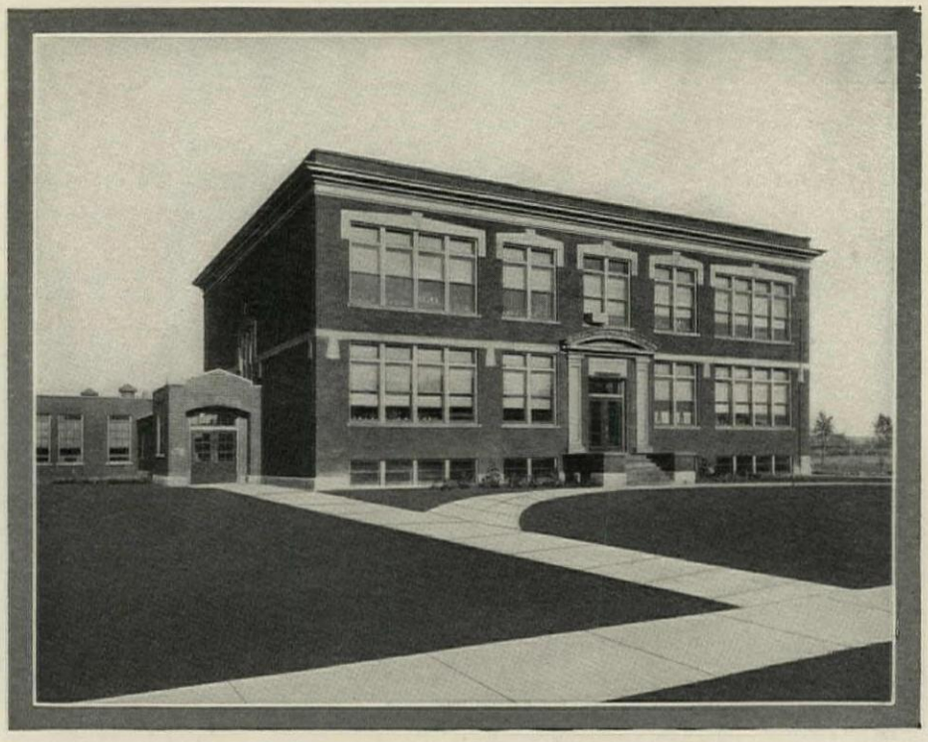
OVERLOOKING Manhattan Square and Central Park, and extending the entire block from 81st to 82nd Street, stands The Beresford, one of New York's newest apartment buildings,—the largest apartment house in the world.

Exquisitely designed and constructed, and incorporating every modern contribution to convenience, comfort and "livability," this imposing edifice proclaims the successful realization of its creators' objective, "the ultimate home for those who desire the best."

Only equipment of unquestioned quality and trustworthiness could conceivably be given a place in a project of such size and character.

That FITZGIBBONS STEEL BOILERS were chosen for the vitally important duty of heating this "community" of 174 homes, is another overwhelming tribute to "the best in steel boiler heat."

FITZGIBBONS BOILER CO., *Inc.*
570 SEVENTH AVENUE NEW YORK, N. Y.



The Sloan Vocational High School, Sloan, N. Y., heated by a Spencer Steel Tubular Boiler, with a guaranteed capacity of 8,000 square feet of steam radiation or equivalent. Excess radiation included in an addition to the building is being carried with no trouble, by the original Spencer installed. Spencer guaranteed capacities will carry the loads specified with room to spare.

Guaranteed capacities . . like a dollar bill . . you can take them at face value

"Picking the boiler" is one operation where the heating engineer, the heating contractor, and often the boiler salesman as well, used to compete with the architect for the prerogative of specification which is the architect's own. The reason was—and still is, in some cases—that the commercial ratings of different boilers were like the prices in an Oriental bazaar—just a figure to start from.

Commercial ratings have been discontinued in connection with Spencer boilers. No one needs to "pick" the boiler size when a Spencer is specified. The catalog does that. Once the total amount of equivalent radiation is known, data that is at hand or readily available, a glance at a Spencer catalog will tell architect, contractor and layman alike, the size of boiler to be installed.

Spencer capacities are guaranteed in absolute terms of square feet of cast-iron radiation or its equivalent. That guaranteed capacity is in the radiators—for due allowance has been made to cover heat loss in covered mains, and returns, and for peak loads.

These capacities can be guaranteed, because they have been proven conservative over a long period of time. Whether it is for the smallest of homes or the largest of buildings, you can accept the Spencer guaranteed capacity at its face value. Have you seen the new Spencer catalog No. 29? It lists and describes, illustrates and gives the guaranteed capacities of all Spencer cast-iron sectional and steel tubular boilers. Write for it. Spencer Heater Company, Williamsport, Pennsylvania.

SPENCER
Magazine Feed
HEATERS
for steam, vapor or hot water

ANTIMACASSARS AND RADIATORS ARE NOW EQUALLY UNNECESSARY . . .

Sectional view of complete Trane Concealed Heater installation. No fussing or special fitting is required on the job.

NEVER in style, never completely at home in otherwise beautifully arranged interiors, radiators may now join the other relics of the past, for Trane perfected Concealed Heating has made them obsolete . . . Trane Concealed Heaters produce more comfort than radiators, and are noticeably more economical. The copper heating element which warms the room is entirely hidden inside the wall, leaving every inch of space free for harmonious arrangement of furniture. The owner sees nothing but the grille (designed and executed in simple good taste), through which warmth is wafted into the room. He is able to turn the heat completely on or off in an instant . . . Trane Concealed Heaters cost a little more than ordinary cast iron radiation, an extra cost which is small indeed, compared to the increased comfort and greatly improved convenience enjoyed by the owner. Concealed Heaters supersede radiators in steam, vapor or hot water systems. Specified and installed with a complete Trane Vapor System, they provide convenient, reliable warmth in the most modern manner. Mail the coupon for the interesting new book, "Modern Style in Room Heating."

HEAT CABINETS **TRANE** CONCEALED HEATERS

PUMPS, UNIT HEATERS, AND HEATING SPECIALTIES

THE TRANE COMPANY *(Established 1885)*
Dept. 12, 220 Cameron Ave., La Crosse, Wis.

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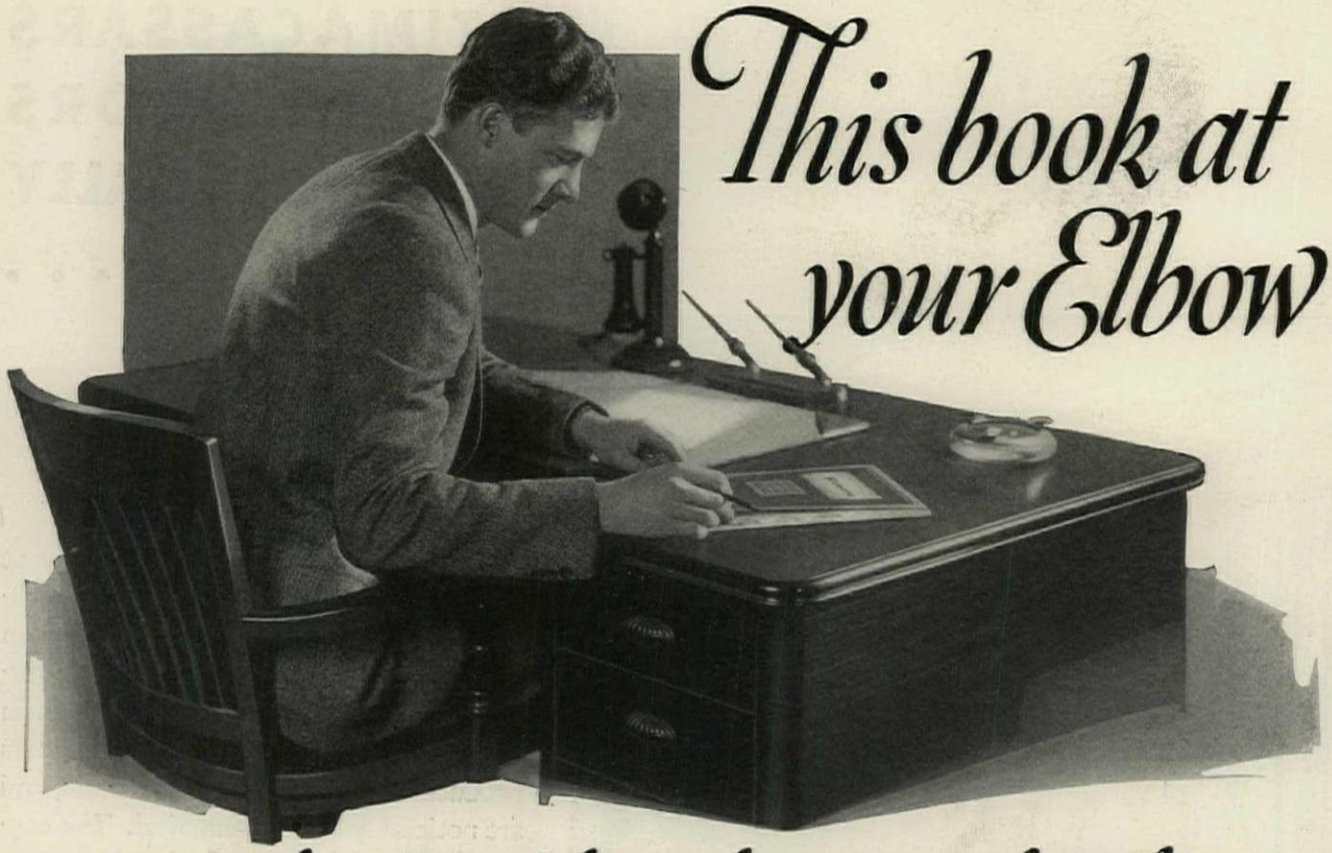

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IT is the new AEROFIN Bulletin, thumb-indexed and containing, in convenient Tabular or Chart form, complete data on all types of AEROFIN, the standardized light-weight Fan System Heat-Surface, together with 23 proved Piping Diagrams in 4 Colors.

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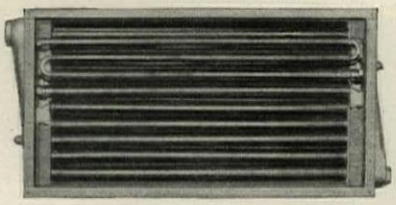
This useful and usable book will be sent gratis if requested on your business letterhead. Ask Newark for Bulletin F-129



AEROFIN is sold only by Manufacturers of Nationally Advertised Fan Heating Apparatus.

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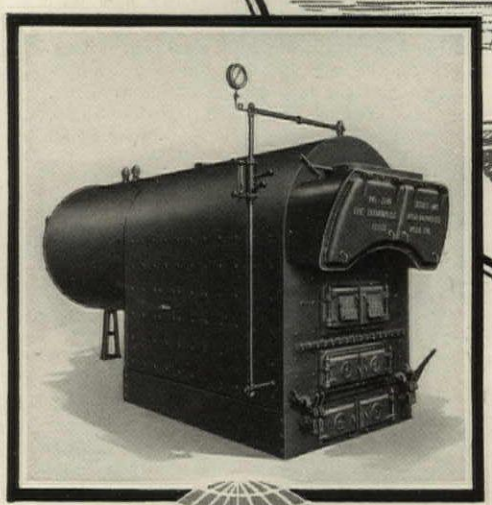

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Titusville Boilers are made to care for all heating needs in the most efficient fashion.

The preference for Titusville Boilers is not strange since *they do* what they are made for.

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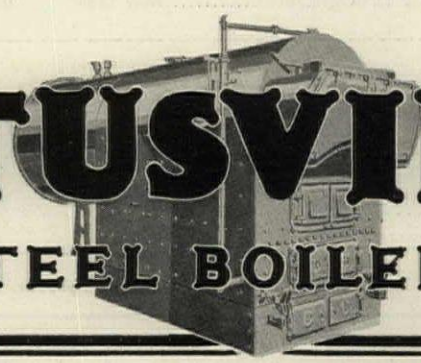
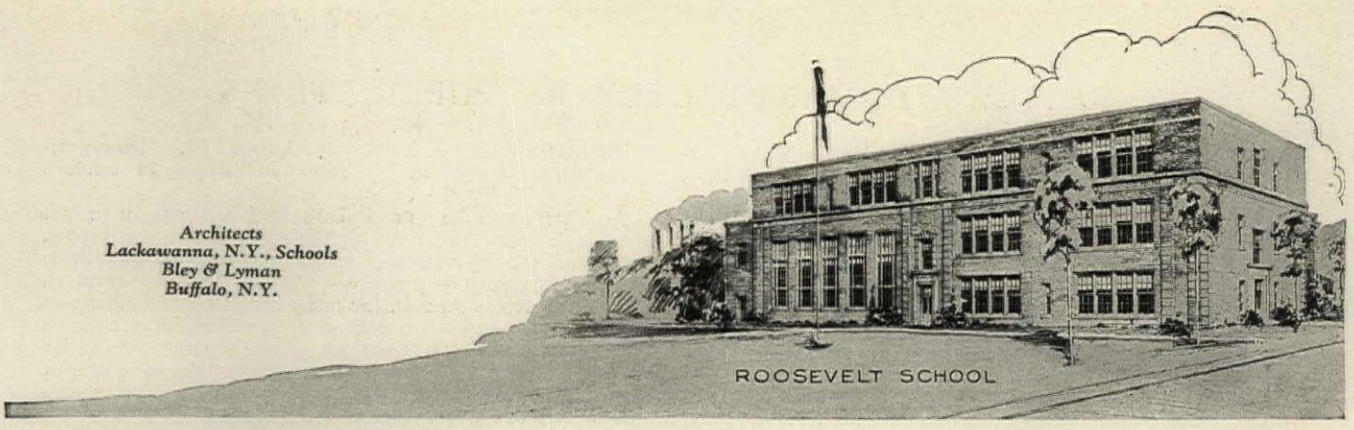


TITUSVILLE
STEEL BOILERS

TIW-17



Architects
Lackawanna, N.Y., Schools
Bley & Lyman
Buffalo, N.Y.

They Like it and— They Say So

PERHAPS one of the most significant things about PeerVent is its large percentage of repeat orders. Scores of School Boards order a single installation as a "try-out" and find the service so satisfactory that additional orders quickly follow.

The Roosevelt School, pictured above, is one of four completed this year in Lackawanna, N. Y., all the outcome of three prior installations in 1923 and 1924.

PEERVENT UNITS

Not only for schools but also for other public and semi-public buildings.

Another interesting case is in Hackensack, N. J. An installation made in 1914 is still giving satisfactory service. For this reason the new school building finished this year is equipped with the latest improved PeerVent Units.

PeerVent offers a service backed by forty years specialization in heating and ventilation, and fifteen years experience in the combined heating and ventilating equipment. Peerless, you know, is the originator of the Unit System of heating and ventilating, and the thoroughness with which it pioneered this field may be judged from the fact that its first year's installations are still giving satisfactory service.

Let us send you the PeerVent booklet which will give you further interesting details.

Peerless Unit Ventilation Company, Inc.
Pioneers in Unit Heating and Ventilating
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Sales and Service Representatives in all Principal Cities from Coast to Coast.

PEERVENT

Heating and Ventilating Units

REVIEWS OF MANUFACTURERS' PUBLICATIONS

AMERICAN GAS PRODUCTS CORPORATION, 376 Lafayette Street, New York. Handbook of Ideal Gas Boilers.

While its cost is generally greater than that of other fuels, it is doubtful if any fuel is quite as desirable as gas. The advantages of its use are many. Since it is supplied only when and as used, no storage area is required; its cleanliness recommends it to housekeepers, and since the gas is paid for *after* and not *before* it is used, it is possible to keep a close check on fuel consumption and so to compensate in some measure for its higher cost. This brochure deals with the fine line of gas boilers produced by the American Radiator Company and distributed by the American Gas Products Corporation. "Home owners who heat their houses with Ideal Gas Boilers enjoy a new standard of care-free heating. The controls, though entirely mechanical in every respect, are almost human in their operation. An unsleeping eye watches the steam pressure or the water temperature and deftly regulates the fire with much more accuracy and patience than could the most experienced fireman. The gas cannot be turned on until the pilot light is burning. The gas is automatically cut off if the pilot light goes out. The gas is automatically cut off if the water (in steam boilers) falls below safe level." Intended for the use of architects and made to accord with the recommendations of the American Institute of Architects, the booklet is replete with every detail of data which an architect, engineer or builder could well desire.

PARKER RUST-PROOF COMPANY, Detroit. "The Parker Process as Applied to Building Material."

Notwithstanding its great strength,—its very name having become a synonym for strength,—iron has its characteristic weakness. Its chief enemy is rust, and unless it is prevented from rusting, iron loses its vitality and is subject to failure. It is absolutely necessary that iron be protected from rust when used for any purpose, structural or decorative. "It was the skill of Jean Tijou, an iron worker during the reign of William and Mary, that proved to a fastidious world that the cunning of wood workers could be equaled by the worker in more durable stuff,—the metals. This man made people see the latent beauty in a piece of ugly iron. Today we may see sketches of some of the beautiful grilles executed by this artist, but time demonstrates the unsubstantial nature of even iron or steel, and it is not given to us to see all the actual products of this pioneer artist's skill. Tijou and his contemporary workers probably regarded iron as the ultimate in stability, but they could not foresee the ages that would follow nor guard against the disintegrating influences that would attack the product of their art. It was the generations that came later that realized the necessity for some means of protecting the material into which so much labor and skill had been wrought. Iron did not endure, as had been hoped, because it was iron,—and rusted. Iron rusts more quickly now than then, as the present-day urge for speedier production and lower costs develops a metal of greater impurity, and susceptibility to corrosion or decay constitutes one of our most pressing present-day problems.

Although the cause of rust is well known, many methods have been tried in an effort to eliminate it, or put off as long as possible the "failing point" of rusted metal. Many types of paints, enamels and lacquers have been tried with slight success, so far as real permanency is concerned. Plating with various non-corrosive metals gives somewhat better results, but it is sometimes considered too expensive or it may have an objectionable color. Alloys of non-corrosive metals, although highly efficient, are out of the question for building purposes. This brochure deals with use of the process known as "Parkerizing" for overcoming the tendency of iron to rust. "Becoming a part of the metal itself, it cannot flake or peel off. The deep matte black color harmonizes with almost any treatment. Corrosion cannot creep under and 'lift' the coating. As the surface is microscopically etched, it affords a natural base for paint. Innumerable tests have demonstrated that it provides greater protection against rust per dollar of cost than can be had through any other known process." The booklet goes quite fully into the entire matter.

RICHARDS-WILCOX MFG. CO., Aurora, Ill. "Disappearing Door Wardrobes." Their advantages in schools.

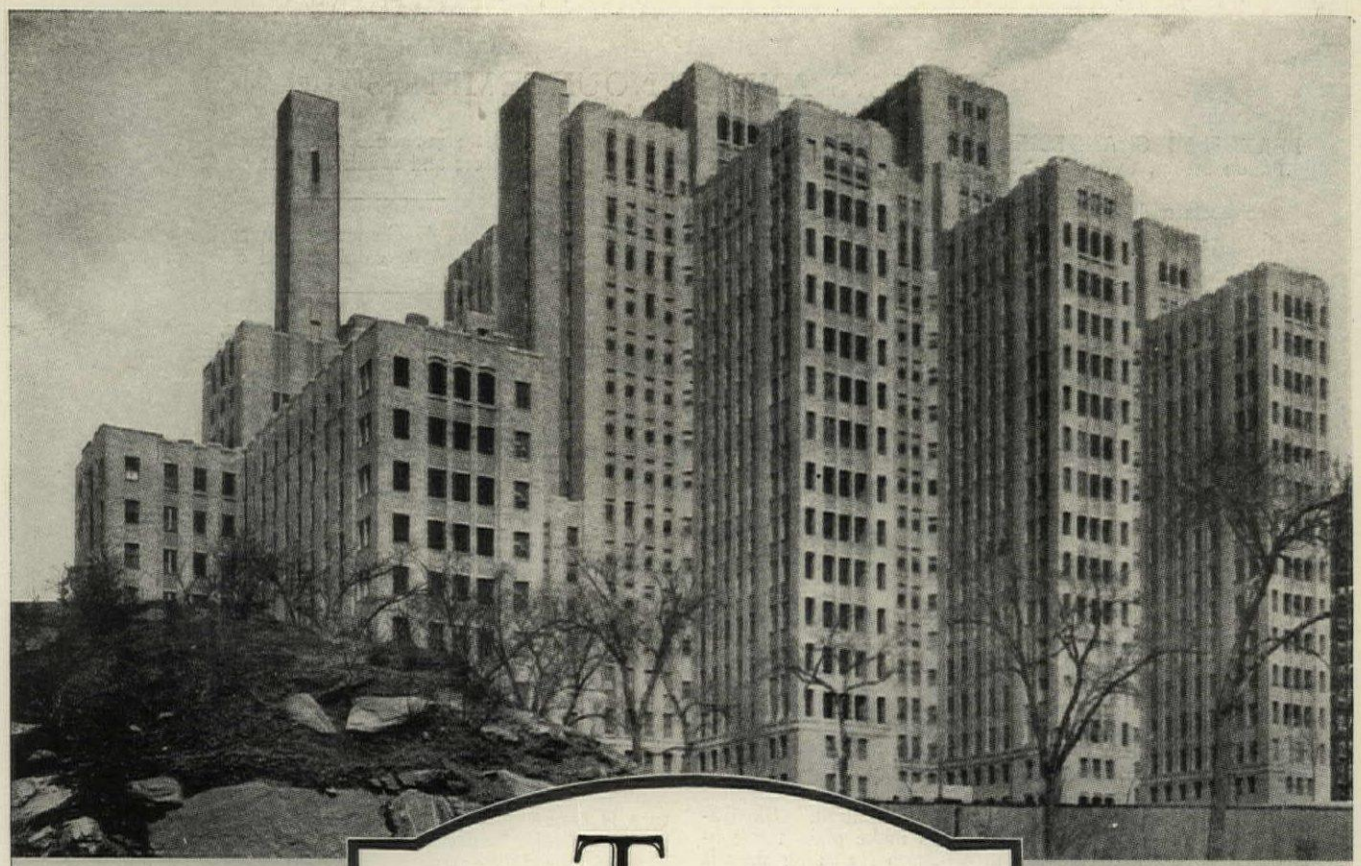
Architects who design and plan school buildings, or in fact structures of any kind to be used by large numbers of people, well know the importance of properly solving what might be called the "wardrobe problem." Perhaps this applies in an unusual degree to schools, for many architects and educators hold that the wraps of school children should be kept not in isolated coat or cloak rooms but in places which are under the direct supervision of the teachers; this of course almost always means that the wraps must be kept in the school rooms themselves, and this brings up the problem of economizing space necessary for the opening and closing of closet doors and likewise the problem of securing proper ventilation, since unless the wraps are ventilated, odor and dampness will circulate through the classrooms. All this gives a particular interest to the booklet entitled "Disappearing Door Wardrobes" being issued by the well known Richards-Wilcox Mfg. Co. It deals with a type of wardrobe extremely economical of space, since the doors open not in the usual way but disappear *into* the wardrobe, while the problem of ventilation is solved by the wardrobes' having ventilating spaces below the doors and ventilating grilles in the tops. The doors themselves may be used as areas for blackboards of composition or real Bangor slate, the usual chalk rail extending just below. The brochure is replete with excellent illustrations.

McQUAY RADIATOR CORPORATION, Chicago. "Modern Ideas in Radiators." Information regarding radiators.

The desire for beauty and modernity is inborn in all of us. Even those who have no particular artistic ability are invariably attracted by beautiful things. Attractive surroundings in our homes are almost necessary, for the effect upon our lives of a home in good taste is far too important to be overlooked. Then, too, everyone who enters our homes unconsciously forms an opinion of us from their appearance. In the matter of radiators we have been far behind the modern trend. Too long have radiators been bulky, unsightly affairs, cluttering up good floor space, soiling walls and draperies, and tending to destroy the charm of our homes. For some years various covers and shields have been used to hide or disguise radiators. These were an improvement, but they could not add to the heating efficiency of the radiators they covered, and they were usually costly. A beautifully illustrated booklet is published by the McQuay Radiator Corporation which will give one full knowledge of modern radiators, for now comes the truly modern McQuay Radiator, unobtrusive, yet smart,—a true adornment in any home, not merely a cover or shield to disguise or hide an old fashioned radiator, but a radiator complete in itself, a radiator that is capable of warming any home comfortably and healthfully.

FLINT FAIENCE & TILE COMPANY, Flint, Mich. "A Little Book Showing Majolica Faience."

Tiles, as all architects know, are among the most useful and important of building materials. Their structural use, of course, has been highly developed owing to the ingenuity and resourcefulness of present-day manufacturers, and yet when one thinks of tiles it is likely to be in connection with their use for non-structural purposes,—for flooring or for facing walls, or else used in more decorative forms for wall panels, fireplace surrounds, wainscots, stair risers, fountains, and all the other purposes for which tiles have been used during centuries and in every country under the sun. This brochure, issued by a large firm of tile manufacturers is full of suggestions likely to be helpful to architects and interior decorators. Its illustrations in black and white deal fully with the matter of pattern or design, while other illustrations in color suggest the richness of effect which may be had when the resources of color are added to those of pattern. One particularly interesting illustration shows a tile developed in 12 different color combinations used for working out the same pattern. The booklet also gives all necessary data.



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Architects . . . New York

Equipped With Johnson Heat & Humidity Control . . . .
Grant . . . . . *Photo.*

THE wide preference awarded Johnson Heat and Humidity Control evidences a valued utility and a leadership. Every type of building, in every state of the Union, contains Johnson Control. The prominence of these structures and the prominence of the architects and engineers responsible for them and recommending Johnson Control are additionally significant.

Johnson Heat & Humidity Control is fundamentally correct in design and installation: and totally reliable mechanically and in constancy of service. That is why Johnson Control is so universally specified.

The Johnson System consists of individual room thermostat and diaphragm operated valve or damper for each room to be controlled; and a compressed air system — all completely connected by small, concealed compressed air piping. Included, are thermostats for controlling the valves and dampers of a building's ventilating system, and humidostats for the control of the humidity. Johnson Control applies to every form and plan and system of heating and ventilating. Interesting Johnson Book of details sent on request.

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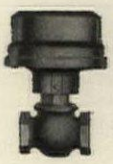

The All Metal System . . . The All Perfect Graduated Control of Valves and Dampers.

The Dual Thermostat (Night and Day) Control . . . . Fuel Saving 25 to 40 Per Cent.

REVIEWS AND ANNOUNCEMENTS

BEARDSLEE CHANDELIER MFG. CO., 216 South Jefferson Street, Chicago. "24 Hour Shipments."

Architects and builders who have experienced the annoyance of having to wait for the manufacturing and delivery of their lighting fixtures will appreciate this booklet issued by a well known firm of manufacturers which illustrates and lists an excellent line of fixtures which can be shipped within 24 hours after an order is received. The line includes fixtures of all the types likely to be required,—fixtures to be hung from ceilings or fixed to walls, finished in a wide variety of metals, and either extremely simple or more or less ornate to accord with the surroundings amid which they are to be used. Along with the fixtures there are to be had all the accessories necessary for their use,—shades or globes, either plain or decorated in colors which add to their effectiveness.

YOUNGSTOWN SHEET AND TUBE COMPANY, Youngstown, Ohio. "Youngstown Buckeye Conduit."

All building codes lay down specific rules for use of conduit as protection for electric wiring. Probably the chief function of conduit is to guard against danger of fire which might be caused by running the wires exposed, but it also protects against tampering with wires by amateurs, for the rapid increase in the use of electrical appliances on circuits not intended to carry the necessary loads often involves serious menace to both life and property. In this brochure the Youngstown Sheet and Tube Company presents complete data regarding its well known "Buckeye Conduit." Illustrations and diagrams of different kinds make plain the construction of the material, full information regarding sizes is given, and there are included illustrations of many well known buildings in which "Buckeye" has been installed.

HOME INCINERATOR COMPANY, Security Building, Milwaukee. "The Brick-set Incinor." Some data on its use.

Not only in hospitals but in hotels, apartment houses and individual residences is the closest attention being given to securing sanitation in every imaginable way. One of the results of this is seen in the growing practice of burning refuse of all kinds instead of merely throwing it away or else dumping it into a river, a bay, or the ocean, to pollute beaches and sometimes to infect water supplies. This publication deals with the "Brick-set Incinor," a waste disposal furnace built upon a rather ample scale and intended, as the front cover of the booklet points out "for all kinds of industrial plants and public institutions, including hotels, hospitals, municipalities, grain elevators, department stores, office buildings, restaurants, factories and clubs." The booklet deals with its subject quite fully, and illustrations and diagrams explain every detail of the Incinor's mechanism, which is easily understood.

GENERAL ELECTRIC COMPANY, Schenectady, New York. "Electric Furnaces for Industrial Use."

Although the possibilities of the metallic resistor electric furnace, as applied to various industrial processes have been recognized for a long time, it is only about ten years ago that there was evolved a type that has proved commercially practical. At that time, General Electric developed what is known as the direct-heat electric furnace. This has been perfected and applied to a multitude of industrial heating processes and is now the recognized standard. The reason for the rapid increase in the use of the electric furnace for so many purposes in preferance to all fuel-fired types may be given in two words, over-all economy. For, granted that the actual cost of energy for operating the electric furnace is higher in many cases than for the corresponding fuel-fired types, the effect of the former on the quality and quantity of the finished product more than counterbalances the difference in fuel cost. In this publication limitations of space forbid the illustration of all the industrial heating processes, but the number and variety of the applications shown are indicative of the extent to which the electric furnace is now being used.

Walker & Gillette announce their removal to the Fuller Building, 57th Street and Madison Avenue, New York.

Andrew E. Kajuk, 46 Summit Avenue, Garfield, N. J., would appreciate receiving catalogs and other publications.

Bacon & Tislow, architects and engineers, announce their removal to the Architects' & Builders' Building, 333 North Pennsylvania Street, Indianapolis.

Frank A. Sexton, formerly of the firm of Wolf, Sexton, Harper & Trueax, Inc., announces the opening of offices at 157 East Erie Street, Chicago. He desires the catalogs and other publications being issued by manufacturers.

JOHNS-MANVILLE CORPORATION, 292 Madison Avenue, New York. "Celite for Concrete."

The meaning of the terms "consistency" and "workability" is often confused, whereas a sharp distinction should be drawn between them when applied to concrete mixes. Consistency is dependent upon the water content and is measured by the slump or flow of a given mix. Workability is governed by the physical properties of the ingredients and refers to the ease with which the concrete can be properly handled and placed. "The workability of any concrete mixture is about equally benefited by one part of Celite, two parts of Kaolin, or three parts of hydrated lime such as used in these tests, if the consistency as measured by the low table is kept constant. For example, in a 1:2:4 mixture the maximum percentages recommended are about 4 per cent of Celite, 8 per cent of Kaolin, and 12 per cent of hydrated lime, by weight of cement. The improvement in workability which is had by these additions is about that which should be had from a 25 per cent increase in the cement content."

GLEASON-TIEBOUT GLASS COMPANY, 200 Fifth Avenue, New York. "Celestialite." Excellent brochure on lighting.

"Both common sense and science indicate that the best remedy for eye strain and poor vision is, more and better light." Mankind lives by light. Primitives worshiped the sun, the source of light. Civilized man had long concentrated every effort to approximate the perfect light of day with artificial light. During the last few years he has brought the electric lamp to a degree of perfection which seems phenomenal when compared with his first crude attempts to use electricity for lighting purposes. The electrical industry has made amazing progress in developing artificial lighting, at a continually decreasing cost. One dollar now buys 14 times as much light as it did 20 years ago. Today man needs light more desperately than ever before. Celestialite, which is manufactured by the Gleason-Tiebout Glass Company, is equipment which brings artificial light closer to daylight. It is advisely named, for its light has the softness and radiance of celestial light without the glare, harshness or color distortion of ordinary artificial lighting equipment, because Celestialite alone is truly next to daylight." This beautifully illustrated booklet will supply one with information concerning Celestialite, its use and its high efficiency at a low cost.

SPRING VALLEY, N. Y., SCHOOL ARCHITECT, ERNEST SIBLEY, PALISADES, N. J. BUILDER, J. B. SCHULTZ, SUFFERN, N. Y.

Read how Lignophol protects wood floors even under abuse!

A. F. THORNTON, Principal of the Spring Valley, N. Y., School, says:

"There was a considerable quantity of plaster, sand and other dirt carried into every room. Now that the floors have been cleaned, they do not show any sign of this abuse."

The wood floors were treated with Lignophol, and had to resist for 12 weeks the wear and tear of traffic during repairs.

Not only does Lignophol protect the surface against grinding wear, but it also prevents warping, cracking, shrinking, splintering, dry- or wet-rot.

Lignophol penetrates into the wood cells and fibres, filling them with the essential oils and gums that insure life.

Lignophol Wax Finish—for floors in residences, apartments and for dance floors—produces a medium or high polish. Already contains wax and need only be polished six hours after applied.

Made in four standard colors: Natural, Light Brown, Medium Brown, and Dark Brown. Easily and quickly applied by any workman at minimum cost. One application means no more material or labor cost for years to come. Be sure to specify Lignophol—a Sonneborn Product.

The Sonneborn Policy is that the architect must always be satisfied. Sonneborn always makes good.

LIGNOPHOL

A Penetrating Preservative For Wood Floors

Some other Sonneborn Products

LAPIDOLITH — a chemical liquid hardener for hardening and dust-proofing concrete floors.

HYDROCIDE COLORLESS — for waterproofing exposed exterior walls.

CEMCOAT—a paint that stays white after others turn yellow. Can be washed over endlessly. Adheres to brick and cement as easily as to wood.

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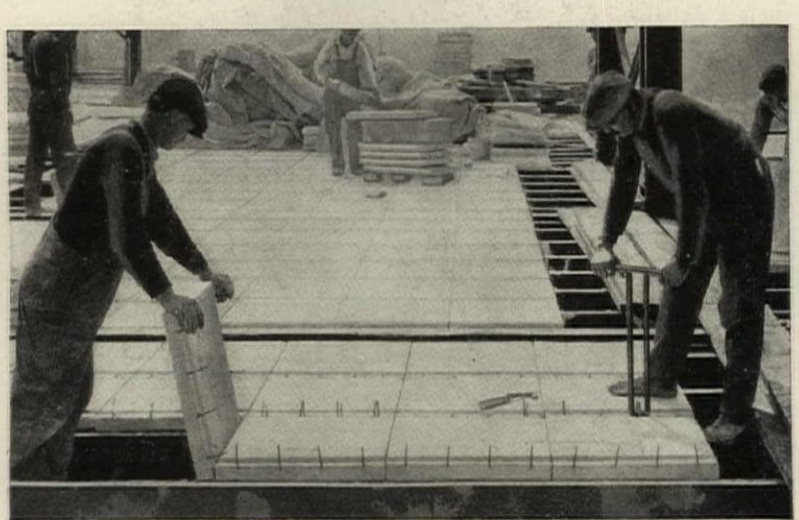
Part 1—Architectural Design

Part 2—Architectural Engineering and Business

Speed winter construction with GYPSTEEL Pre-Cast Floors

Suspending Ceiling Slabs by hangers from steel floor members, which may be rolled shapes or open-web welded joists.



Laying Floor Slabs on top of steel members and tying steel rods together.

No forms
No waiting
No salamanders

IF YOU want to work right on through the winter months with warm weather speed, then you want Gypsteel Pre-Cast Floors.

Because—no forms are used. Pre-Cast gypsum slabs for the floors and ceilings are delivered to the job all ready to be put in place.

Ceiling slabs are suspended from steel floor members by hangers, as shown in top photo to the left. Ceilings are grouted.

Then floor slabs are placed on steel members, as shown in lower photo; they're grouted; and the floor is ready for finish.

Installation Is Rapid

It's as simple as that. Any weather in which men can work is Gypsteel weather. No forms. No water (except very small amount for the grout). No special precautions. All of which means *no waiting*.

And Gypsteel Floor Construction usually costs no more.

We'll be glad to send our catalog, telling all about it.

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Pre-Cast Fireproof Floors and Ceilings made only by

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Co-operative Apartment at 730 Park Avenue in which ROBRAS 20-20 Radiators are installed.
Lafayette A. Goldstone —*Architect*
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Method of installing ROBRAS 20-20 Radiators under the window, in a wall four inches deep.

There's always a REASON why they use ROBRAS 20-20's

THERE'S always a reason why the builders of the best equipped apartments use ROBRAS 20-20 Radiators. Sometimes the reason is one of aesthetics. Sometimes it is one of practicality. Sometimes it is a combination of both.

However, with ROBRAS 20-20's *in the wall, out of sight,* and *out of the way* no tenant can have any what-shall-I-do-with-the-radiator problem.

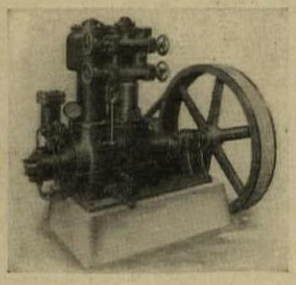
This means satisfied tenants, full apartments and happy owners.

ROME BRASS RADIATOR CORPORATION

ONE EAST FORTY-SECOND STREET • • NEW YORK CITY

If economy in temperature control means anything at all to you, it should mean YORK Refrigeration and the advice of YORK engineers.

Expert refrigeration advice and constructive criticism are freely available to all architects.



Many of the outstanding recent buildings have been equipped with YORK refrigeration.

Just a letter—and a YORK engineer is on the job

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SHERARDUCT

in DETROIT

PERMANENCE

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Pittsburgh, Pa.