THE ARCHITECTURAL FORUM

IN TWO PARTS

ARCHITECTURAL ENGINEERING & BUSINESS

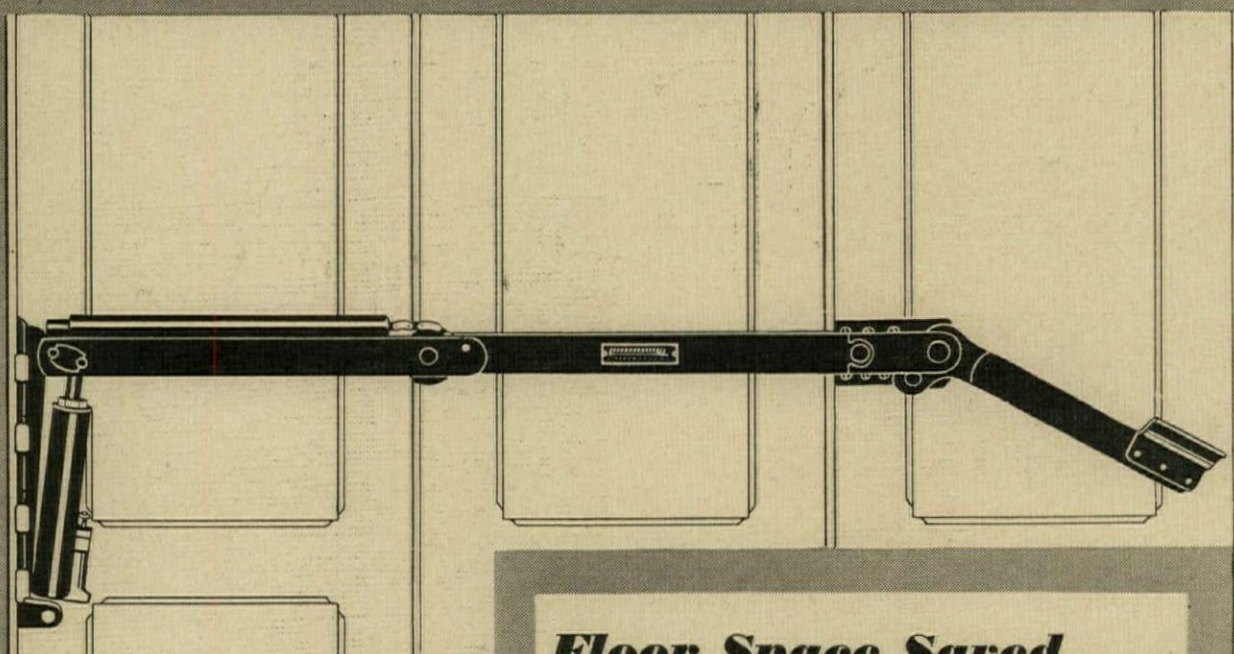
PART TWO

JUNE

1929

SHOP AND STORE REFERENCE NUMBER
PRICE $3

...One Proven Responsibility for Elevator Door Operation



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

"Quality leaves its imprint"

Floor Space Saved Pays for Equipment

In space saving alone, R-W closers are revolutionary. Single type closers require *no space* behind doors. Two and three speed types require *only one-half inch clearance* behind doors, compared with 5 to 7½ inches ordinarily required.

Closer and check are separate mechanisms, giving more power in closing doors and demanding less effort to open them.

Equally important exclusive features belong to R-W hangers and interlocks, truly noteworthy contributions to elevator door engineering.

You can depend on R-W equipment and the PowR-Way Electric Door Operator for complete service in meeting all conditions required by building and safety codes.

Standardize on R-W Exclusive Principle Closers, Hangers, Interlocks.

Call in an R-W engineer any time.

Richards-Wilcox Mfg. Co.

"A Hanger for any Door that Slides."

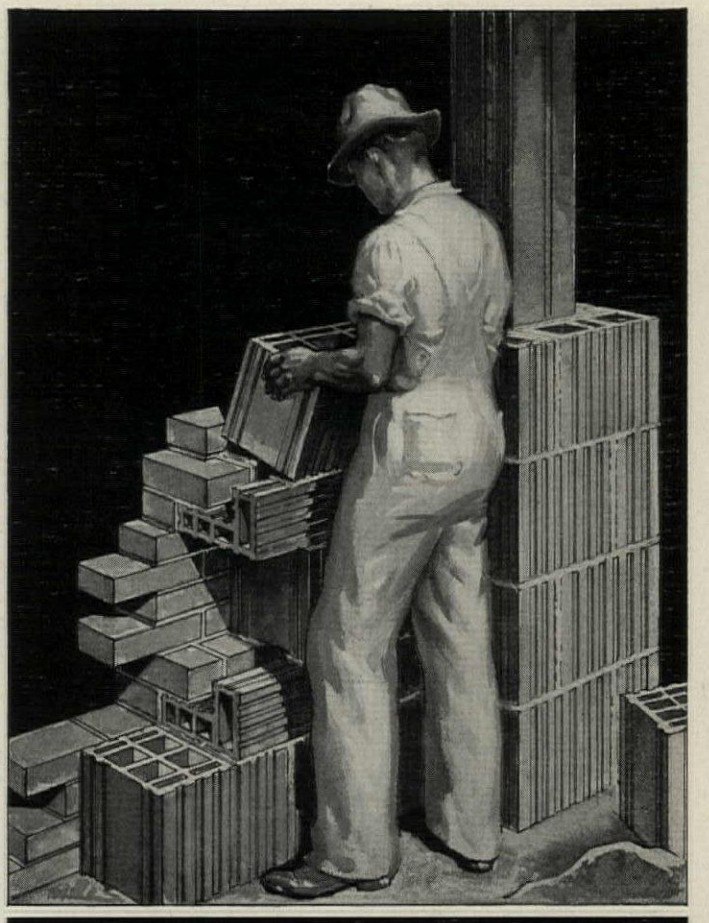
New York . . . . AURORA, ILLINOIS, U.S.A. . . . . Chicago

Boston Philadelphia Cleveland Cincinnati Indianapolis St. Louis New Orleans Des Moines Minneapolis Kansas City Atlanta Los Angeles San Francisco Omaha Seattle Detroit

Montreal · RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT. · Winnipeg

FOR THE PROTECTION OF STEEL WORK

NATCO STRUCTURAL CLAY TILE IS THE RECOGNIZED STANDARD



It is essential that steel columns, and the girders and beams projecting below the floor slab, be protected by at least two inches of fireproofing material. Experience has proven that well-burned hollow tile (vitrified at a temperature of about 2000°, and so immune to flame) has no equal as a covering for structural steel or iron, both to bar fire, and guard against corrosion.

Natco Girder and Column Covering saves from 50 to 75% in weight over concrete or brick covering. There is a shape to fit almost any condition. The fireproofing can be put in place *complete* for close to the same price it costs to erect box forms about the beams to receive concrete. No forms are needed to hold the tile in place, and there is no period of waiting for shores or forms to be removed. And the tile provides an ideal plastering surface, on which only two coats are needed.

In case of a serious fire, the integrity of the entire structure depends on the *proper protection* of the steel-work—a responsibility that Natco Girder and Column Covering has demonstrated its ability to adequately meet.

NATIONAL·FIRE·PROOFING·COMPANY
General Offices: Fulton Building, Pittsburgh, Pa.
Branch Offices: New York, Chanin Bldg; Chicago, Builders Bldg; Philadelphia, Land Title Bldg; Boston, Textile Bldg.
In Canada: National Fire Proofing Co. of Canada, Ltd., Toronto, Ontario

NATCO
THE COMPLETE LINE OF STRUCTURAL CLAY TILE

PAGE A383 – A416

TURN TO "SWEET'S"

RAYMOND

VIRTUALLY a one-piece pile—that is the result obtained by the Raymond Method of joining the timber to the concrete in this type of l-o-n-g pile. It is as perfect in the ground as on paper, as this cut-away section demonstrates.

RAYMOND CONCRETE PILE COMPANY

NEW YORK: 140 Cedar St. CHICAGO: 111 West Monroe St.

Raymond Concrete Pile Co., Ltd., Montreal, Canada

ATLANTA	BUFFALO	DETROIT	LOS ANGELES	PHILADELPHIA	SAN FRANCISCO	WASHINGTON, D. C.
BALTIMORE	CHICAGO	HOUSTON	MIAMI	PITTSBURGH	ST. LOUIS	LONDON, ENGLAND
BOSTON	CLEVELAND	KANSAS CITY	MILWAUKEE	PORTLAND	ST. PAUL	

CAST IN PLACE PILES
COMPOSITE PILES
PRECAST PILES
PIPE PILES

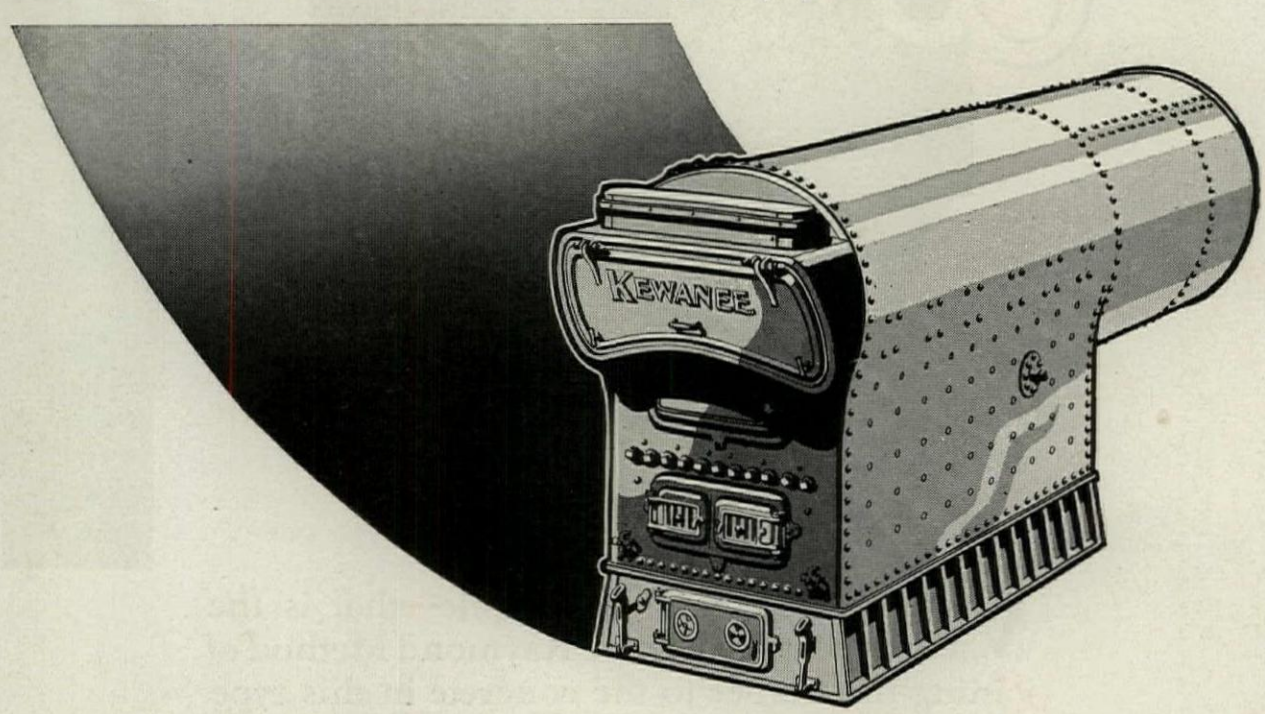
*"A form for every pile
A pile for every purpose"*

BUILDING FOUNDATIONS
BULKHEADS AND DOCKS
UNDERPINNING ETC.
BRIDGES.

KEWANEE

STEEL RIVETED BOILERS

Spread the Original Cost of the Heating Boiler over the 25, 30 and more years a Kewanee will be "on the job" and the purchase price becomes relatively unimportant. The first few *extra years of service* more than offset any small additional amount originally paid.



On top of that, a Kewanee will *save fuel every year of its existence.* **So that in the end it actually is the most economical boiler that can be had.**

Owners know that a Kewanee in the basement adds to the value of any building. So they "Build from the Boiler — UP," invariably selecting Kewanee.

For hard coal, soft coal, oil—no matter what the fuel—there's a Kewanee properly designed and built to burn it economically.

KEWANEE BOILER CORPORATION Kewanee, Illinois
Branches in 40 Principal Cities

ASH REMOVAL

R. H. MACY & CO. USES *Five* G&G TELESCOPIC HOISTS

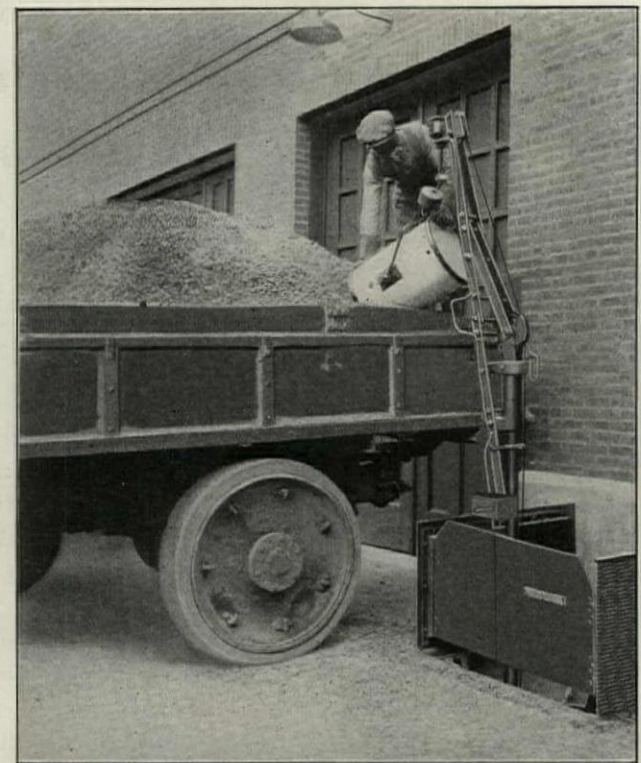
THE Model D Electric Hoist, illustrated at right, is one of *five* G&G Electric Hoists in use in buildings of R. H. Macy & Co. (The World's Largest Department Store), New York, N. Y., Robert D. Kohn, Architect.

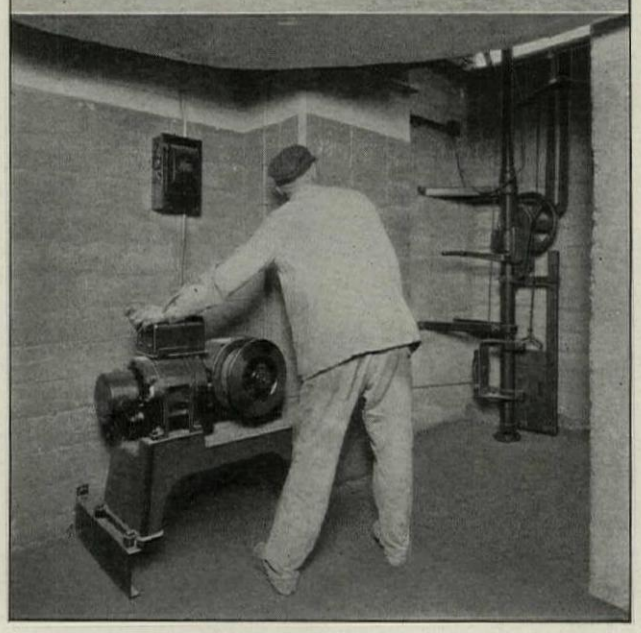
There are many prominent buildings throughout the country for which G&G Ash Removal Equipment has been selected. Among these are the U. S. Capitol, Washington, D. C.; Independence Hall, Philadelphia; U. S. Chamber of Commerce, Washington, D. C.; Roosevelt's Birthplace, and Holland Tunnels, New York, etc.

More than 1,800 schools use G&G Telescopic Hoists for ash removal, as well as Banks, Office Buildings, Churches, Factories, Hospitals, Garages, Theatres, etc. 168 Bell Telephone Buildings are G&G equipped.

G&G Telescopic Hoists are noted for their economy in operation, long life and freedom from repairs. Many installations are over 20 years old. The cost of operating the electric models is remarkably low, unbiased tests showing 78 cans of ashes and more raised and lowered at a cost of one cent for current. Hand models, too, for buildings with small volume of ashes to be removed.

Full safety is provided by the G&G Sidewalk Doors and Spring Guard Gate, operating automatically and completely protecting the sidewalk opening at all times. Complies with all municipal ordinances.





GILLIS & GEOGHEGAN, Inc.

(Managing also G&G Atlas Systems, Inc.)

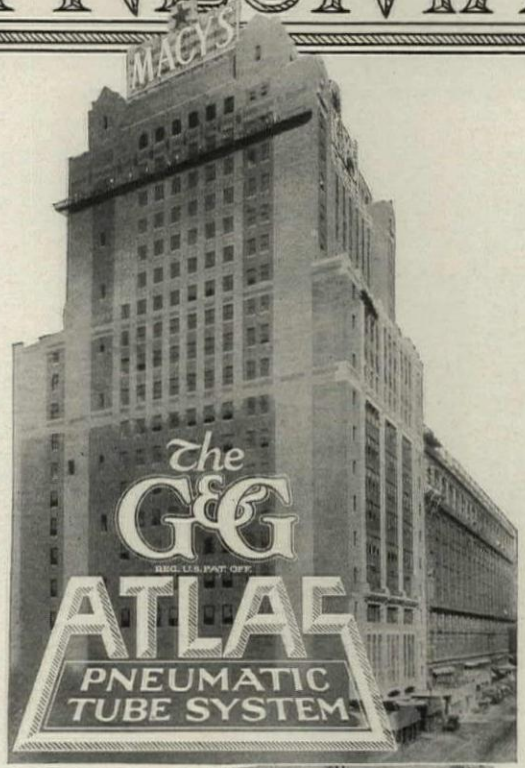
544 West Broadway **New York, N. Y.**

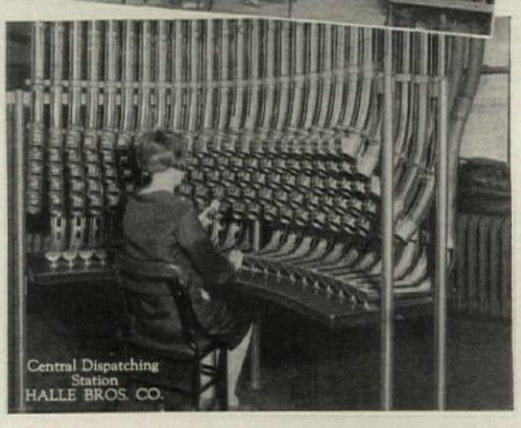
407 Dominion Bank Bldg., Toronto

Catalog in Sweet's Archt. Cat., 23rd Ed., pp. C3729-37
Catalog in Specification Data, 1929 Ed., pp. 226-227

The G&G ELECTRIC REG. U.S. PAT. OFF.
Telescopic Hoist

PNEUMATIC TUBES





IN THE WORLD'S LARGEST DEPARTMENT STORE

R. H. MACY & CO., New York, N. Y. (Robert D. Kohn, Archt.), has 327 Pneumatic Tube System lines in the Old Building. Formerly, these were operated by THREE 80-h.p. Connorsville Positive Blowers. Two were operated *constantly* and one held in reserve. G&G Atlas Power-Saving Controls were installed on all lines. This made it necessary to use only ONE of the 80-h.p. blowers. The second was placed in reserve and the third was taken out.

The 19-story addition to the Macy store is equipped throughout with a G&G Atlas Pneumatic Tube System, and there are now 507 tube lines in both buildings, operated from same power plant, serving 904,283 square feet of selling space.

Other large Department Stores using G&G Atlas Pneumatic Dispatch Tube Systems are Joseph Horne & Co., Pittsburgh; The Halle Bros. Co., Cleveland; L. S. Ayres, Indianapolis; Abraham & Straus, Brooklyn; Stern Brothers, New York; Woodward & Lothrop, Washington; Strawbridge & Clothier, Philadelphia; D. M. Read & Co., Bridgeport; Wise, Smith & Co., Hartford; and many others.

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 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 Archt. Cat., 23rd Ed., pp. C3740-41
Catalog in Specification Data, 1929 Ed., pp. 228-229

G&G ATLAS SYSTEMS, Inc.
(Under Gillis & Geoghegan Management)
544 West Broadway New York, N. Y.
407 Dominion Bank Bldg., Toronto

Detroit Free Press Building
DETROIT, MICH.
Architect
ALBERT KAHN

PRODUCTS

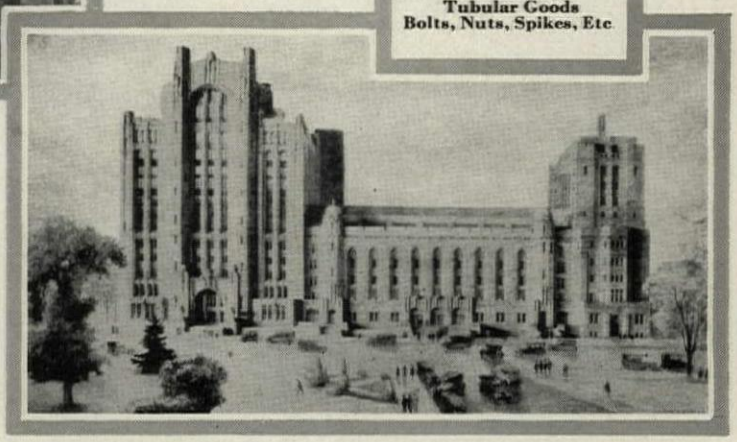
Pig Iron
Semi-Finished Steel
Bars and Shapes
Hot and Cold Rolled Strip
Skelp

Black, Blue Annealed, Galvanized, Electrical and Long Terne Sheets

Coke Tin Plate
Tin Mill Black Plate

Black and Galvanized Standard Pipe

Oil Country Tubular Goods
Bolts, Nuts, Spikes, Etc.



Masonic Temple
DETROIT, MICH.
Architects
GEORGE D. MASON & CO.

Built deep in the walls of many of the finest skyscrapers and public buildings, are their Republic Steel Pipe systems carrying water, heat, air and drainage.

Important to the maintenance of healthful living conditions in the buildings, these hidden structures of tubular steel are in daily service, year after year. They *must* be dependable; they *must* endure; they *must* not fail.

The name "Republic" written in your specifications for Steel Pipe insures to the builder a quality that meets such unyielding demands.

Branch Offices

Birmingham, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, El Paso, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Seattle, St. Louis

REPUBLIC
IRON & STEEL CO. YOUNGSTOWN O.
STEEL PIPE

A. HOLTHAUSEN'S in Union City, New Jersey, is another department store that protects profits and patrons with Exide Emergency Lighting.

No Light Failure in Modern Department Stores

Architects specify Exide Emergency Lighting Batteries for *reliable* protection

MODERN department stores guard against sudden darkness. They know that current failure might mean confusion, loss of sales . . . loss of goods . . . loss of important good will. That's why architects are specifying Exide Emergency Lighting Batteries to *dependably* protect department stores.

RADIN AND KAMP department store at Fresno, California, is protected against sudden darkness by dependable Exide Emergency Lighting Batteries.

Specially Designed . . . Automatic

Should the normal current supply fail, for any reason, lights are switched to Exides *instantly and automatically* . . . without a hand touching a switch. And the devices that charge and control these batteries are automatic, simple and foolproof. No added men—no expert experience—needed to attend them.

All over the country these dependable batteries have proven their worth to hospitals, auditoriums, theatres and other places where light failure might have serious consequences.

Five Vital Characteristics . . . Forty-one years of building batteries for every purpose stand behind the Exide Emergency Battery. In this battery are combined to the highest degree these five important qualities: (1) long life, (2) absolute power dependability, (3) freedom from trouble, (4) moderate initial cost, (5) low operating cost.

An experienced Exide representative is at your service at any time. Consultation entails no obligations. Just write what time is convenient.

THIS 60-CELL Exide Battery assures A. Holthausen's store of good lighting at all times.

Exide
EMERGENCY LIGHTING BATTERIES

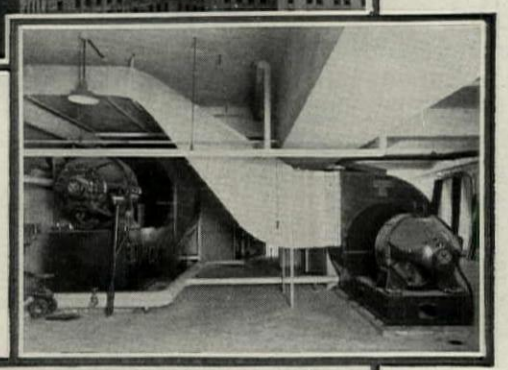
THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

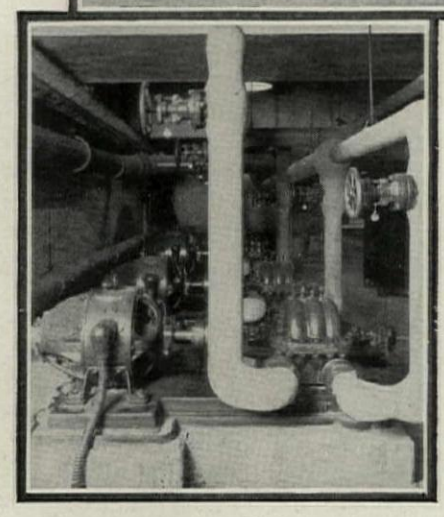
Exide Batteries of Canada, Limited, Toronto

Architects: Graham, Anderson, Probst and White.

Heating and Ventilating Contractors: A. R. Brueggeman Company.

In *the* NEW Terminal Tower





FIFTY-TWO stories above the Public Square in Cleveland the tower of the Terminal Building reaches skyward.

In keeping with the size and character of this building, more than ordinary consideration was necessarily given the planning of its pumping and ventilating systems. The fact that Westinghouse motors were selected to drive the main circulating pumps, the fire pumps and the ventilating fans, stands as evidence of the recognized dependability of this equipment. Modern in design, of smooth and quiet operation, these motors assure years of consistent performance.

WESTINGHOUSE ELECTRIC & MFG. COMPANY
EAST PITTSBURGH PENNSYLVANIA
SALES OFFICES IN ALL PRINCIPAL CITIES OF THE UNITED STATES AND FOREIGN COUNTRIES

Westinghouse

T 30432

Products for buildings include--

Circuit-Breakers	Insulating Materials	Safety Switches
Elevators	Lamps	Switchboards
Fans	Lighting Equipment	Transformers
Fuses	Motors and Control	Turbines
Heaters	Panelboards	Wiring Devices

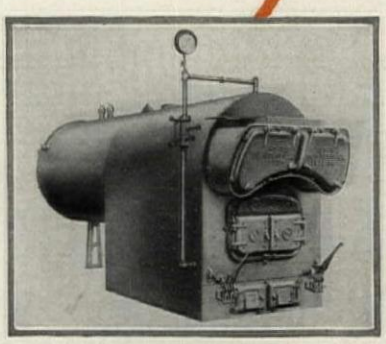
Westinghouse Electrification
Appliances Apparatus
Wiring
THIS SIGN YOUR GUARANTEE
W
WESTINGHOUSE ELECTRIC

In New York's prominent buildings

THROUGH the years, as new principles of construction justify themselves Titusville adopts them.

Today as during yesterday and as will be tomorrow, Titusville Boilers keep a step ahead —built better than the needs of today, but justified in their performances of tomorrow.

That is why you'll find them in many of New York's prominent buildings.



Series "W" Welded Fire Box Boiler

THE TITUSVILLE IRON WORKS CO.
Titusville, Pa.

TIW-5

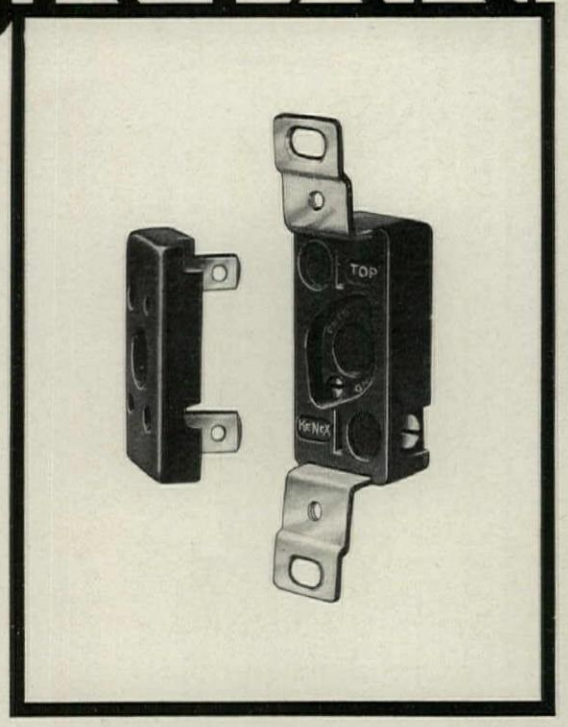
TITUSVILLE

SERIES "W" WELDED, FIRE BOX

BOILERS

BRYANT

"KENEX" PLUG & RECEPTACLE



A PRACTICAL QUICK, SAFE METHOD FOR THE INSTALLATION OF WALL BRACKETS ETC.

BRYANT
SUPERIOR WIRING DEVICES

The Plug and Receptacle Principle applied to Lighting Fixtures for Walls

"KENEX" plug and receptacle have many advantages beside that of practical easy installation. Their use enables the electrical contractor to finish and test his work, as fixtures may be quickly attached at any time, without soldering or taping of wires. There are no protruding, taped wires dangling from outlet boxes, endangering the decorator's finishing work. A satisfactory selection of fixtures is assured as they can be easily "plugged in" "on the job" instead of on their confusing selection in crowded showrooms or from catalog. Fixtures can be readily taken down for refinishing, cleaning, replacement or when redecorating.

"KENEX" is installed in a standard switch outlet box and requires no more especial alignment or centering than is given to any switch or convenience outlet device. All wiring connections are made to binding screw terminals. The electrical connection is made by "plugging in". The mechanical support of the bracket is completed by anyone of three standard methods—threaded stud, two screw or French hook.

Complete bulletins on "KENEX" *sent on request.*

ORDER THROUGH YOUR JOBBER

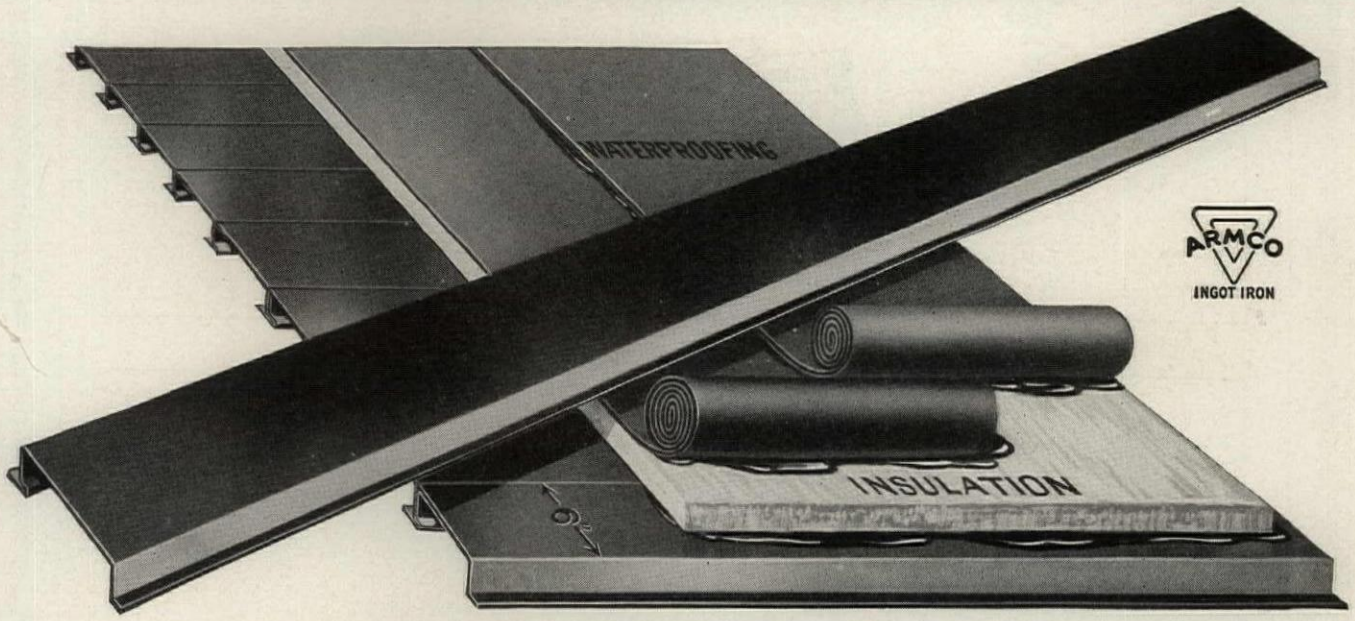
THE BRYANT ELECTRIC COMPANY

BRIDGEPORT, CONN., U. S. A.

NEW YORK PHILADELPHIA CHICAGO SAN FRANCISCO

Manufacturers of "Superior Wiring Devices" since 1888—Manufacturers of Hemco Products

GENFIRE *announces the last word in* Roof Decks



RIGIDECK FOR ROOFS

Insulated to any Degree and Waterproofed

The Most Advanced Type of Roof Construction

In line with Genfire's policy of anticipating building needs with products of advanced engineering design, Genfire now offers Rigideck Steel Roofs. This high quality Roof Deck consists of Armco Ingot Iron units which interlock throughout their length, forming rigid reinforcing ribs and a smooth, continuous, unperforated roof surface. These 6″ wide units are positively attached to the purlins on each rib, with all joints staggered.

Rigideck — insulated and waterproofed—is quickly installed and at low cost. It forms a permanent, fire-safe roof for any shape of roof or any kind of building. It is of sufficiently light weight to effect economies both in field labor and supporting framework. Furnished in 6″ wide units of either 18 or 20 gauge Armco Ingot Iron with 1¼″ and 1¾″ depth of ribs and in lengths up to 30′. Write for full information.

GENFIRE STEEL COMPANY, YOUNGSTOWN, OHIO

Warehouses and Offices in all Principal Cities. *Dealers Everywhere*

Masterbuilt Floors

HARDENED DUST-PROOF CONCRETE

Plus Omicron

CONCRETE FLOORS are subjected to two kinds of wear—abrasion and disintegration. Abrasive wear is best minimized by Master Builders Metallic Hardner. Disintegration, however, is caused by solutions deposited upon concrete surfaces by precipitation and traffic. The attack of these mild chemical solutions, so insidious and commonplace as to pass unnoticed, is none the less real. Through their action the concrete is gradually weakened and prepared for disintegration. In the case of floors, abrasion caused by the wear and tear of traffic produces the final and visible step in the breaking down of this weakened mass. ¶ Nine years ago the chemists and engineers of the Master Builders Research Staff set themselves the task of finding the "something hidden" which would check this disintegration. Month after month, year after year, they labored with test tube and test blocks seeking for a something which, perhaps, did not exist. At times they felt that success was very close at hand, only to come against dead ends and blank walls which meant that months of wearying effort had proved futile. ¶ Then came a new clue. ¶ A new avenue of possibility was explored. A new ingredient was evolved, it was tried, and—the long sought results were achieved. This new ingredient, this discovery of Master Builders Research Laboratory was christened Omicron.

THE EXPLORER

"Something hidden.
Go and find it.
Go and look behind
the Ranges.
Something lost behind
the Ranges.
Lost and waiting
for you. Go!"

RUDYARD KIPLING

MASTERBUILT FLOORS

Masterbuilt Floors

HARDENED DUST-PROOF CONCRETE

METALICRON FLOORS

CHECK DISINTEGRATION

-as well as Abrasive Wear

COMBINED with Master Builders concrete hardners, Omicron fostered a new family of products—the first of which is Metalicron. [*]

Metalicron [Master Builders Metallic Hardner *Plus Omicron*] comes forward out of a background of nearly twenty years of successful service. During this period Master Builders Metallic Hardner has given building owners protection against abrasive wear. Scores of early installations have stood the test of wear under severe traffic conditions for almost two decades. Today, with the addition of Omicron as a new ingredient, Metalicron is destined to provide an even greater degree of permanence in industrial floors.

The floors in many plants and warehouses are continually covered with substances that cause and accelerate disintegration of the concrete. The condition pictured here is commonly observed.

Corrosion Ever Present Checked by Omicron

The effect upon concrete of the salt thrown upon icy sidewalks is well known; the short life of concrete drain tile in alkali soils needs no mention; the effect of sea water and the pitting of concrete near equipment containing even mildly corrosive liquids are equally obvious. These injurious factors are not restricted to special isolated conditions but, in one form or another, are present and active on practically all concrete surfaces, attacking the soluble particles that remain in the set concrete.

* [Other members of the family are Colormix, which produces colored, wearproof concrete, and Master Mix, the integral hardner so widely used in commercial building construction.]

METAL

Masterbuilt Floors

HARDENED DUST-PROOF CONCRETE

Omicron, now a constituent of the new Metallic Hardner, Metalicron, checks such disintegration by reducing the ratio of these soluble particles, converting them from liabilities to strength-giving factors in the structure. Mild acids and alkalis, which from one source or another come in contact with most floors, particularly in industry, now find this point of attack fortified.

So, not only is abrasive wear checked, but disintegration, that insidious and ever present enemy of concrete floors, is given no chance to weaken the structure and make it more susceptible to abrasive wear.

Abrasive wear from heavy equipment or loaded trucks is at best a severe test. Failure starts at spots where oil drippings have been absorbed and the concrete weakened by the consequent disintegration.

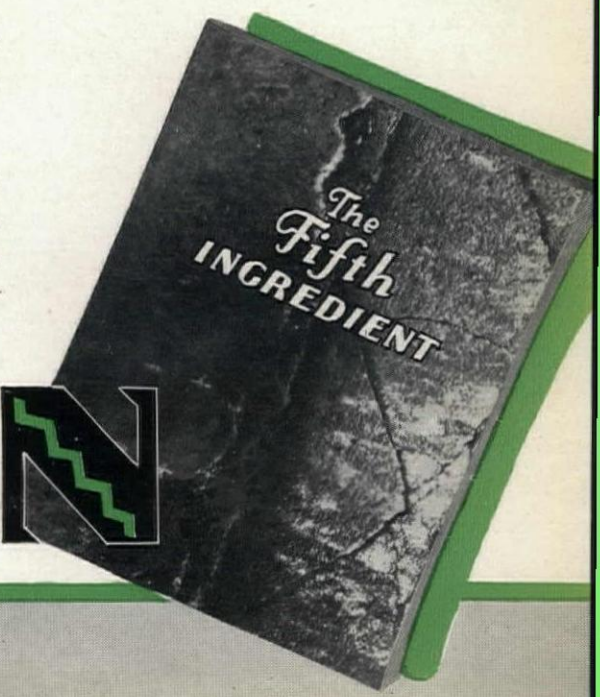
And in addition—Greater Strength

Combining the proved capacity of Master Builders Metallic Hardner to resist abrasive wear, with the proved capacity of Omicron to check corrosive disintegration, Metalicron also greatly increases the tensile and compressive strength of the concrete.

Exhaustive tests of compressive strength of Metalicron concrete compared with ordinary concrete show an increase of over 31%. Tensile tests indicate an increase of over 42%. Metalicron concrete, after 21 days in a mild sulphuric acid solution, showed a tensile strength of 780 pounds per square inch, ordinary concrete but 400 pounds. After 21 days in sulphate solutions, the tensile strength of Metalicron concrete tested 990 pounds, ordinary concrete 350 pounds. These are the facts — indisputable evidence of new high levels in concrete floor construction, far-reaching in importance to architects, engineers and building owners.

Thus Omicron has, practically overnight, antiquated all outstanding specifications for hardened concrete. It has brought new high standards of serviceability and permanence to industrial floors.

The whole story of protection from abrasive wear and from the disintegration to which all concrete is subjected, is told in a 28 page book: "The Fifth Ingredient." Send for a copy.



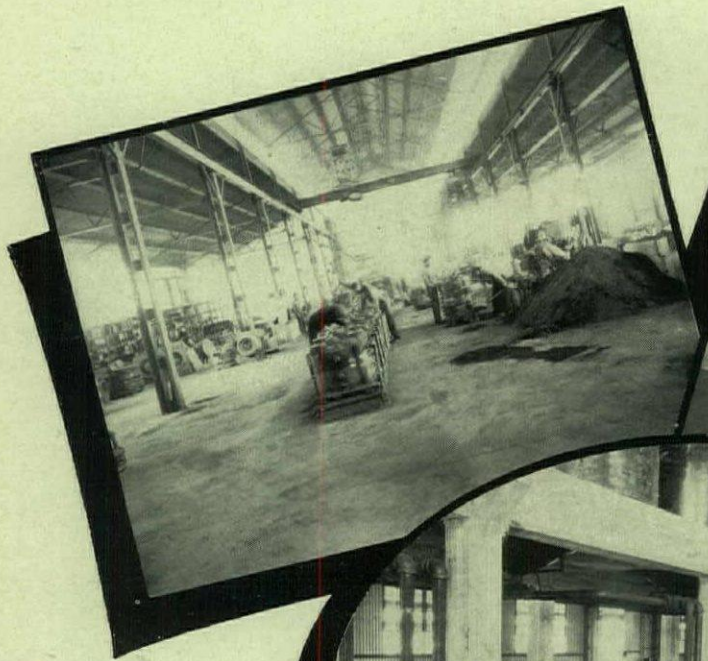
I C R O N

Masterbuilt Floors

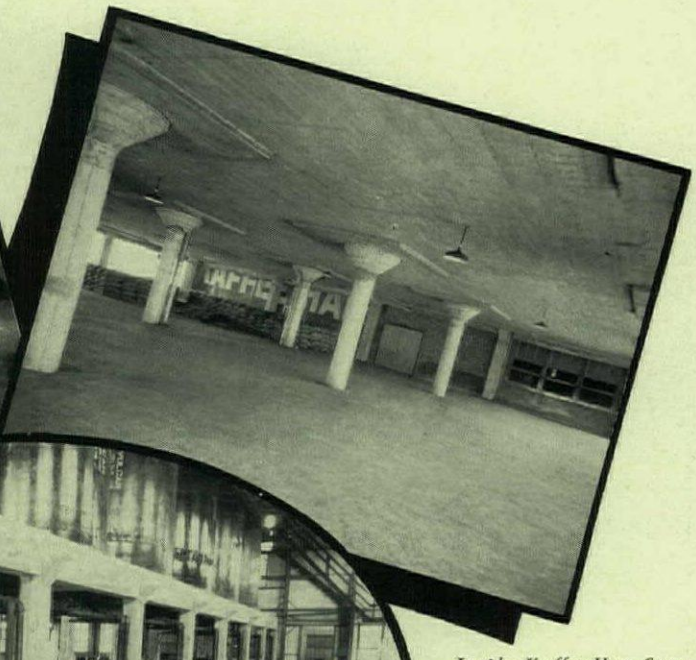
HARDENED DUST-PROOF CONCRETE

Installations of Metalicron Concrete Floors

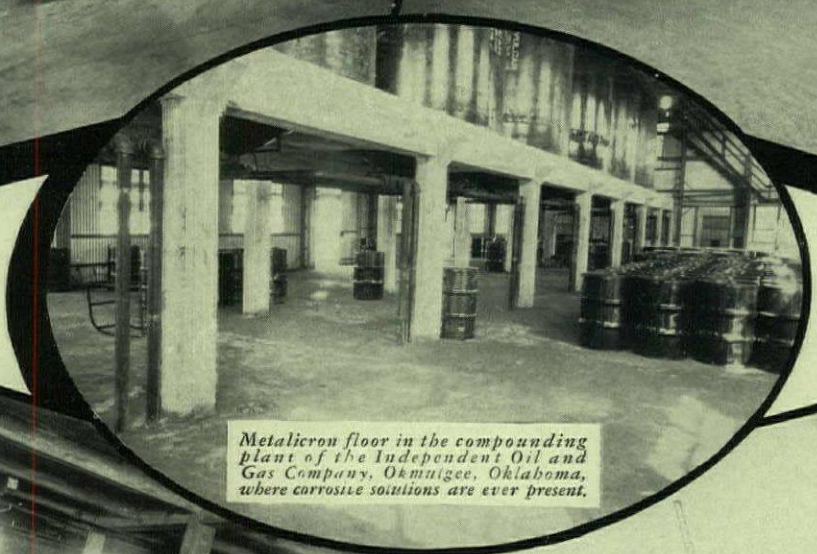
With Omicron as the fifth ingredient in the concrete, these floors are protected from corrosive as well as abrasive wear



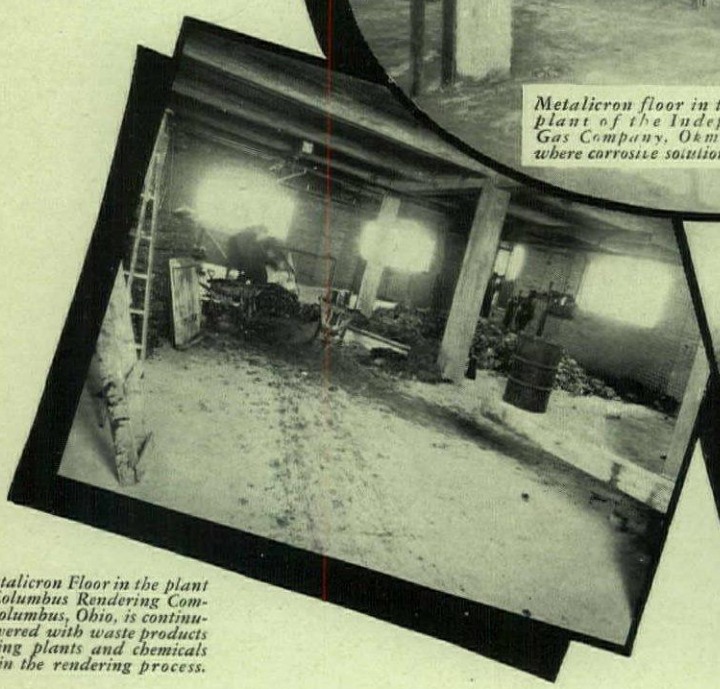
Kay Steel Wheel Company's Alhambra, California Foundry operates on a Masterbuilt Metalicron Floor.



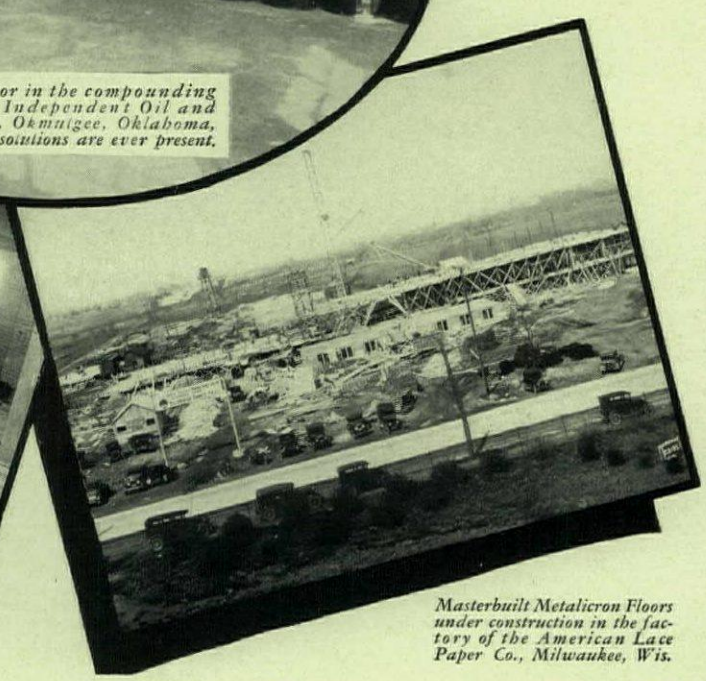
In the Kaffee Hag Company's Cleveland Plant, Masterbuilt Metalicron Floors carry coffee storage and manufacturing processes.



Metalicron floor in the compounding plant of the Independent Oil and Gas Company, Okmulgee, Oklahoma, where corrosive solutions are ever present.



This Metalicron Floor in the plant of the Columbus Rendering Company, Columbus, Ohio, is continuously covered with waste products of packing plants and chemicals present in the rendering process.



Masterbuilt Metalicron Floors under construction in the factory of the American Lace Paper Co., Milwaukee, Wis.

MASTERBUILT FLOORS

TRADE MARK

THE MASTER BUILDERS COMPANY

Cleveland, Ohio

Manufacturers of Metalicron, Colormix, Mastermix, Dycrome, Stainproof, Saniseal

An important part of important buildings *everywhere*

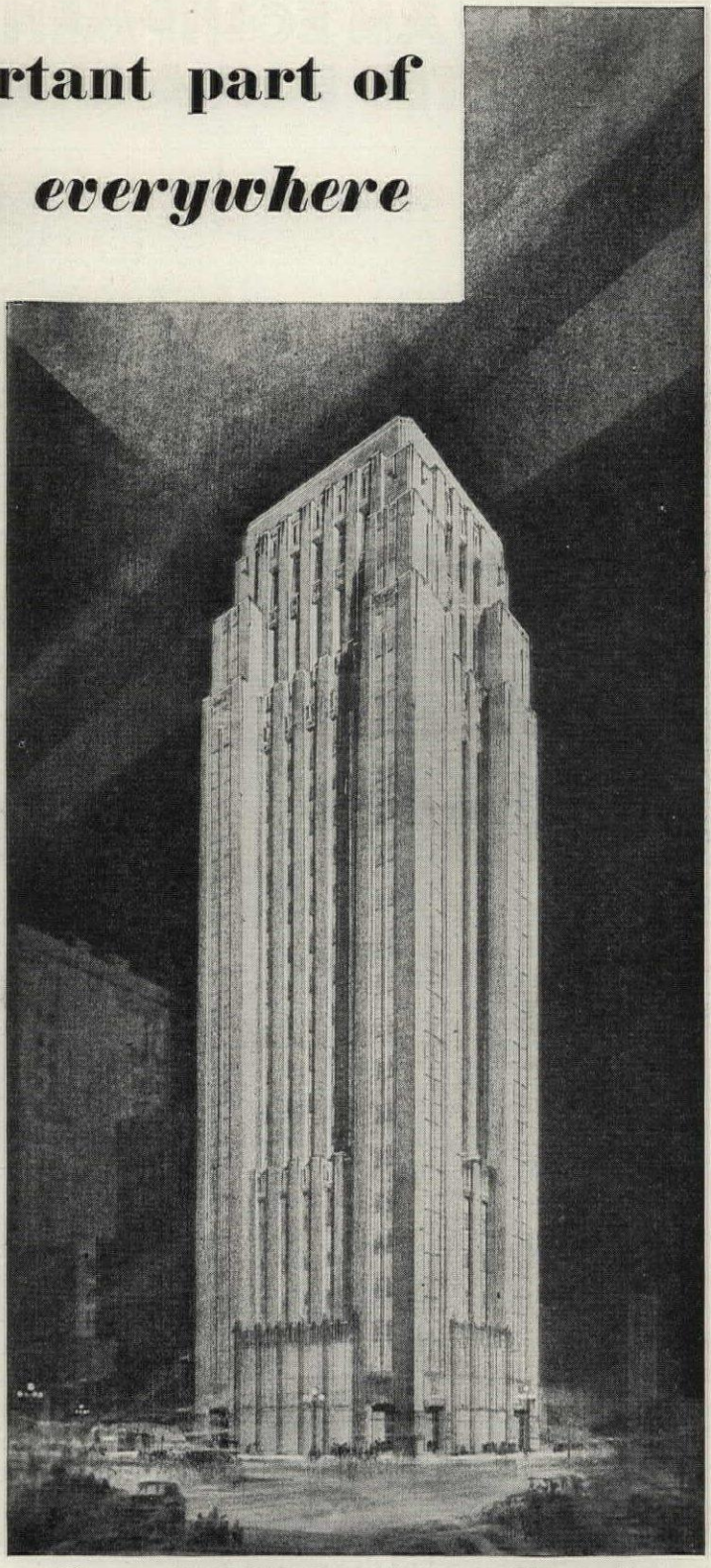
WHEN you specify a Barrett Specification Roof, you specify expert application by a Barrett Approved Roofer—a man who has proved his ability to meet the high standards of Barrett Inspection Service. You specify bonded freedom from roof annoyance for 20 years*, but records show that the owner will probably receive anywhere from 10 to 30 years of service over and above the bonded period—an "extra dividend" which Barrett Roofs have declared hundreds of times.

Such is the Barrett reputation that most important new skyscrapers and civic buildings seem almost automatically to *go Barrett*—thus joining the ranks of the country's best-protected buildings. A roll-call of Barrett-roofed buildings would list an imposing array of the country's best-known industries and finest structures—new and old.

Minneapolis' new 25-story Rand Tower—a striking, monumental structure erected by Rand Laboratories, consulting engineers—is a typical example. It will be one of the Northwest's finest buildings. Yet it is only one of many enterprises of similar importance throughout the country for which Barrett Specification Roofs have been chosen.

If grouped together these buildings would make a city of such importance and proportions that even laymen would fully realize why architects and builders everywhere have confidence in Barrett—and always are able to support their judgment by showing nearby examples of Barrett Roofs of Coal-tar Pitch and Felt and gravel which have stood the test of time for 30, 40 and even 50 years.

*The Barrett Company also offers a Specification Type "A" Roof which is bonded for 10 years. This type of roof is adaptable to a certain class of buildings. The same high-grade materials are used, the only difference being in the quantities.



The new RAND MEMORIAL TOWER, in Minneapolis, Minn., protected by a Barrett Specification Roof. *Architect:* Holabird & Root, Chicago, Ill. *General Contractor and Roofer:* C. F. Haglin & Sons Company, Minneapolis, Minn.

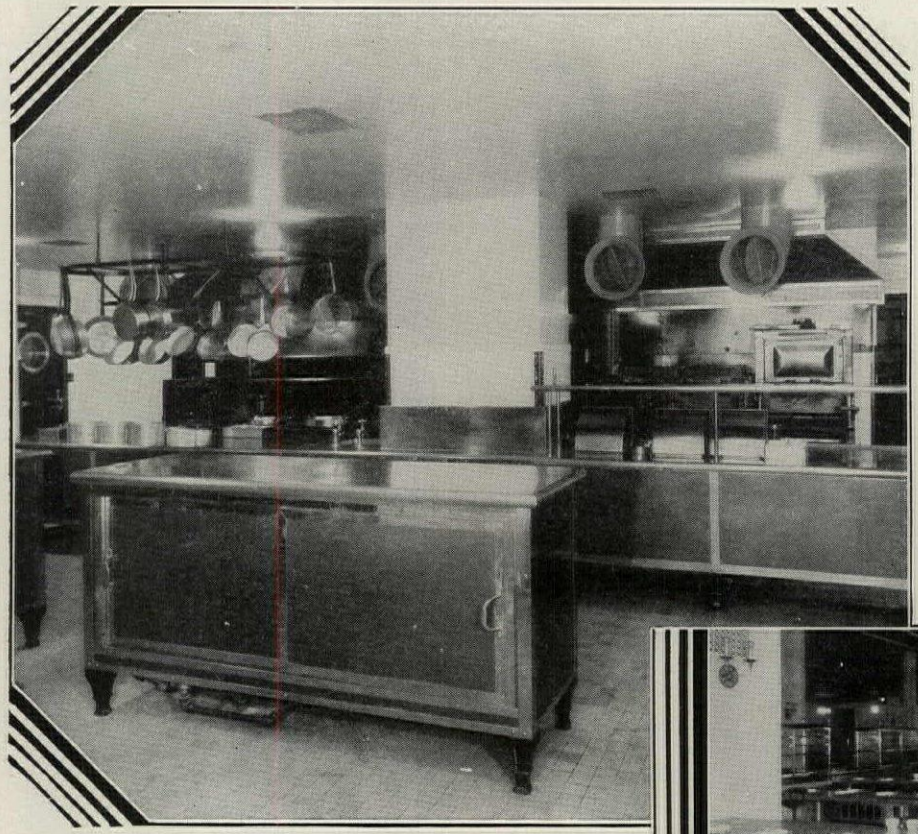
Barrett Specification Roofs are constructed of alternate layers of prime quality tarred felt and the finest coal-tar pitch, armored and fire-safed with surface-imbedded gravel, slag or tile. They are laid by Barrett Approved Roofers according to the Barrett Specification and bonded by Barrett against repair or maintenance expense.

Barrett Specification Roofs

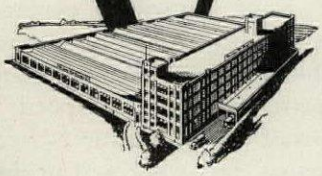
Inspected and Bonded by Barrett

THE BARRETT COMPANY, 40 Rector St., New York ∿ *In Canada* ∿ THE BARRETT COMPANY, Ltd., 5551 St. Hubert St., Montreal, P.Q

AGAIN VAN EQUIPMENT OF MONEL METAL IS SELECTED FOR A SAVARIN RESTAURANT



The Great VAN FACTORY
The largest of its kind in the world



Left, a general view of the superb kitchen of the new Savarin Restaurant in the New York Life Building, New York. Cass Gilbert, *Architect.*

It is interesting to note that approximately twelve tons of Monel Metal were used in the new Savarin. The John Van Range Company—the largest single user of Monel in kitchen equipment field, has long been famous for its Monel Metal Equipment.

Above, a view of the counter section of the Savarin. This equipment was designed and built in the great Van Factory.

Once more Van Equipment has stood the most exacting test of all—the test of actual service. After having proved its worth, efficiency and superiority of design in the beautiful Graybar Savarin in the Graybar Building, New York—Van Equipment of gleaming, durable Monel Metal was again selected for the marvelous new Savarin Restaurant in the New York Life Building. This is one more instance in the long record of cases in which Van equipment was chosen after extensive tests, trials and minutest scrutiny. Not by chance has Van Equipment maintained for more than seventy years its reputation as the "standard of the world."

See SWEET'S, pages C4040 to C4045 for important architectural information.

ATLANTA
CLEVELAND

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

DALLAS
NEW ORLEANS

DIVISION OF ALBERT PICK-BARTH COMPANY, INC.

Chicago Sales Office
1200 West 35th Street

Detroit Sales Office
180 East Larned Street

New York Sales Office
38 Cooper Square

Cincinnati Sales Office
Oakley

BLOXONEND FLOORS FOR CONDE NAST PUBLICATIONS

Nearly all prominent school architects specify BLOXONEND for gymnasiums and shops.

Pictured above is a Conde Nast Plant, Stamford, Conn.—one of three plants of that Company floored with a total of 100,000 sq. ft. of BLOXONEND.

Highly glazed paper used in VANITY FAIR, HOUSE & GARDEN and other Conde Nast Publications, is transported on lift trucks. To prevent dislodgement of cargo (with subsequent damage), and to permit the movement of loads with ease, safety and rapidity requires a vibrationless, *lastingly smooth* trucking floor. BLOXONEND MEETS THESE REQUIREMENTS. It also affords a clean, comfortable, working surface for employees.

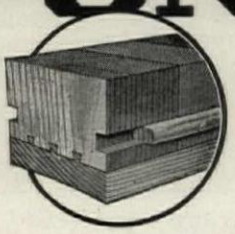
America's greatest industrials are finding BLOXONEND a profitable floor investment because it speeds up traffic and eliminates floor upkeep.

Write for specifications and sample.

CARTER BLOXONEND FLOORING COMPANY
Kansas City, Missouri

Branch Offices in Principal Cities—See Sweet's.

BLOX-ON-END FLOORING



Lays Smooth Stays Smooth

Bloxonend is made of Southern Pine with the tough end grain up. It comes in 8 ft. lengths with the blocks dovetailed endwise onto baseboards.

A NEW and SIMPLE WAY to make sure of LUMBER QUALITY

This sign of CONFIDENCE identifies the 4-SQUARE DEALER

SUBSTITUTION of lumber of cheaper species and lower grades than called for in the Architect's specifications has always been difficult to detect and prevent.

Now the architect can make substitution impossible.

You need simply specify 4-Square Lumber of the species and grade you desire. 4-Square Lumber is packaged for *identification* and *protection*. The *species* and *grade* are marked on the label and *guaranteed* by Weyerhaeuser.

It comes to the job in the *original* packages under the *original* label—for you to see and check. There can be no "mistake."

4-Square Lumber, grade for grade, is the finest lumber you have ever seen. It is properly seasoned—and milled to precise standards of size and finish.

Furthermore, 4-Square Lumber is cut to exact lengths and *trimmed square at both ends*—eliminating needless hand trimming at the job.

Reliable lumber dealers are now prepared to supply—and reliable contractors are using—4-Square Lumber in the items of finishing lumber now manufactured under the 4-Square brand.

WEYERHAEUSER FOREST PRODUCTS
ST. PAUL, MINNESOTA

Weyerhaeuser Sales Co., *Distributors*, Spokane, Washington
District Offices: Minneapolis, Kansas City, Chicago, Toledo, Pittsburgh, Philadelphia, New York

4 SQUARE LUMBER

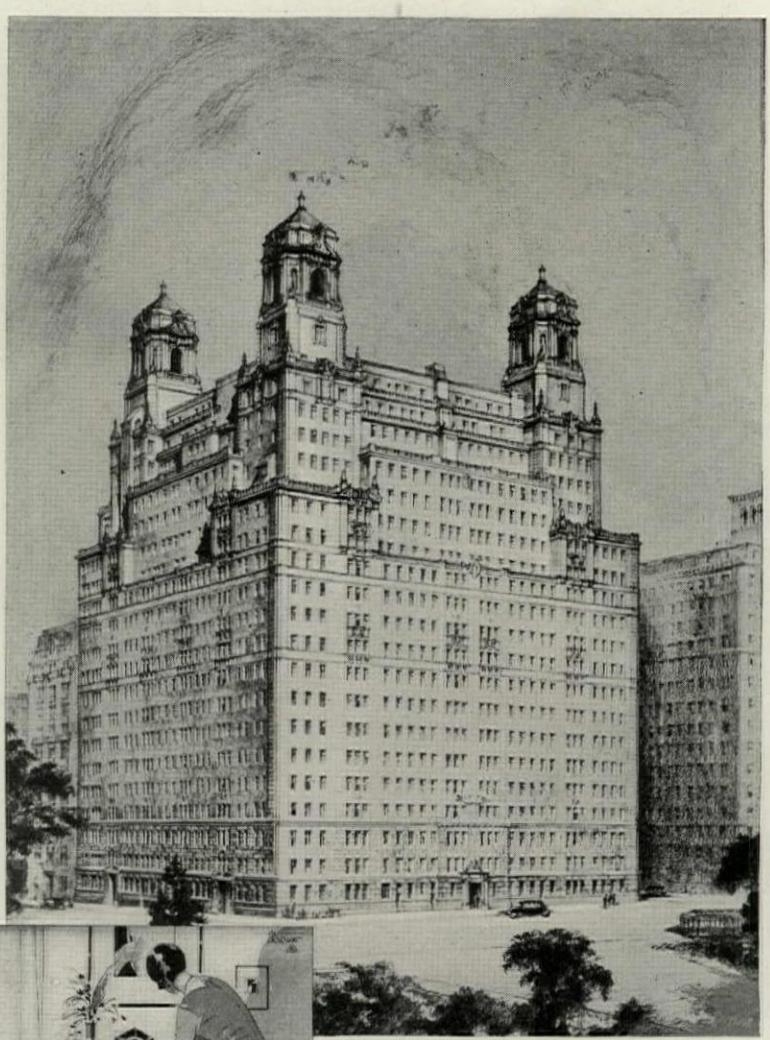
Species and Grade are Marked and Guaranteed

TRIMMED SQUARE .. PACKAGED .. READY TO USE .. GUARANTEED

Beresford Apartment (NEW YORK)

will be equipped with

RCA CENTRALIZED RADIO



Beresford Apartment, 219 Central Park West, N.Y.
Emory Roth, Architect

EVERY suite in the Beresford Apartment, now under construction in Central Park West, New York, will have a radio outlet connected with an RCA Centralized Radio system.

The antenna problem will be solved for both tenants and owners. Three aerials on the roof will serve 182 apartments, and give each tenant the opportunity of "plugging in" his favorite receiver (of any type) as though he had his own individual aerial. Radio reception by this simplified RCA system is very much better than with a multiplicity of antennae.

RCA Centralized Radio is being adopted by hotel and apartment house builders as necessary equipment in modern residence construction. It is available in two principal forms:

1 A single antenna connected with a distribution system to radio receivers in rooms throughout the building. As many as 80 radio sets of different makes can be independently operated from this common antenna, by plugging into wall outlets—and far more satisfactorily than by the use of individual antennae. Additional central antennae may be installed, if required, for additional groups of 80 receivers.

2 Centralized radio receiving equipment to distribute broadcast programs to as many as 3000 rooms throughout a building. Equipment may be installed to transmit a single program, or to make available the choice of programs from two, three or four broadcasting stations.

The first method is ideally adapted for apartment houses, dormitories, office buildings, etc., where tenants desire to have their own receiving sets. It does away with the unsightly multiplicity of individual aerials, and the inconvenience of connecting them with distant rooms.

The second method is particularly designed for hotels, hospitals, sanitariums, schools, passenger ships, etc., where transient occupants of rooms may enjoy radio programs from loudspeakers or headsets, all operated from a central receiving instrument.

Descriptive pamphlets of these two systems, and of the special apparatus designed for them, are available for architects, builders and building owners.

The Engineering Products Division, Radio-victor Corporation of America, at any District Office named below, will answer inquiries, and prepare plans and estimates for installations of any size.

ENGINEERING PRODUCTS DIVISION
RADIO-VICTOR CORPORATION OF AMERICA
261 FIFTH AVENUE, NEW YORK CITY

Chicago, Illinois	*Atlanta, Georgia*	*Dallas, Texas*	*San Francisco, California*
100 West Monroe Street	*101 Marietta Street*	*Santa Fe Bldg.*	*235 Montgomery Street*

BOOK DEPARTMENT

STAGE LIGHTING

REVIEWED BY

ROBERT L. AMES

THE interest of the present-day theater is due to a variety of causes, among the chief of which is the use of accessories which in the hands of certain modern wizards of stagecraft might almost seem to have been given their utmost imaginable exploitation. The modern drama originated within the walls of cathedral or church, with ecclesiastics as actors and the gray stone of nave or choir as a setting, the action dealing with some sacred or scriptural theme or else developed in the form of a "mystery" or a "miracle" play. With the setting up of the stage outside the church, though still often using the church as a background, the playing was done by laymen; only when the drama moved from the church into the market place or into the courtyard of an inn did it wholly part with its ecclesiastical tradition,—and such was its status when Shakespeare found it in the sixteenth century. The beginning of the use of scenery marked a vast change in the life of the drama, for with scenery there might be made some attempt at creating a setting which would heighten the illusion and make more true to life the drama being worked out upon the stage. But the development of lighting was still in its childhood,—in fact its infancy. The stage, however, made the best use of what means of lighting existed; candles gave way to oil lamps, the lamps yielded to gas, and we are now living in the period when gas has made its final, unconditional surrender to electricity, and electricity in the hands of theater men of the twentieth century is being made to work marvels in the way of stage lighting.

This excellent work presents an exhaustive study into every phase of lighting as applied to the modern stage. It has been prepared by one well trained in the technique of stage lighting and fully experienced in the use of the technique. The volume possesses a high value to architects, for architects are finding that each year the matter of equipment becomes more complex and more important, and that almost as necessary as skill and taste in designing and care and accuracy in construction is the matter of planning equipment,—all the countless and intricate details which are included in that most comprehensive term. When one remembers that the utility of even the costliest theater depends wholly upon the skill with which its stage is lighted, the importance of the subject may be realized by architects and their assistants.

STAGE LIGHTING. By Theodore Fuchs. 500 pp. 6 x 9 ins. Price, $10. Little, Brown & Company, Beacon Street, Boston.

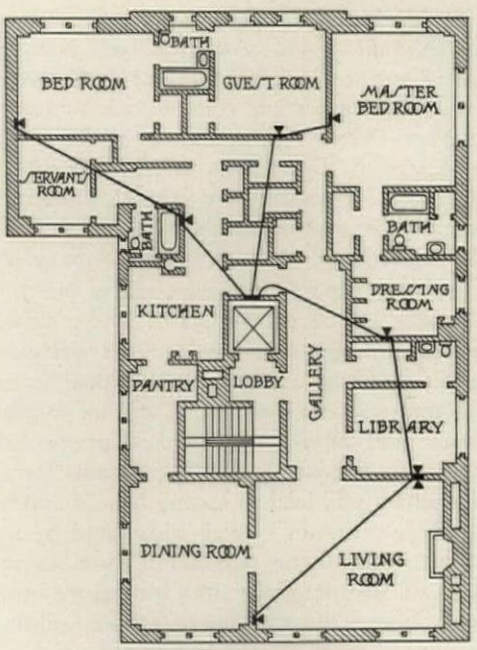
SCHOOL BUILDING PROGRAMS IN AMERICAN CITIES. By N. L. Engelhardt, Professor of Education, Teachers' College, Columbia University, 566 pp., with many maps and diagrams. 6 x 9 ins. Price $5. Bureau of Publications, Teachers' College, Columbia University, 525 West 120th Street, New York.

THERE are few buildings involving greater annual expenditures than schools. It is estimated that the average cost of school buildings in the United States per year is about $400,000,000. The spending of this enormous amount of money presents a problem that in fairness to the taxpayers, as well as to the pupils who are to attend the schools, should be solved in a way to insure the utmost possible return in terms of utility and service, as well as in æsthetic worth. In approaching this problem, those who are charged with the responsibility may well profit by the example of modern business. It is a well known fact that much of the tremendous progress being made in industrial and business fields is due to the fact that every move is carefully planned in advance and is justified by a careful scientific investigation of existing conditions and those likely to arise in the future. Thus money and labor may be expended in the most efficient manner possible. For example, telephone companies lay cables and construct exchanges not only to meet present or isolated conditions, but in terms of estimates of future patronage. Any enterprise that is planned for the purpose of serving the public should be founded on a similar scientific and exhaustive survey.

One of the characteristics of present day building is the quickness with which buildings become obsolete and have to be replaced. In some instances this may be due to unavoidable causes, such as rapid growth, or to conditions and developments that could not have been foreseen. In many cases, however, such wasteful operations are made necessary by a lack of foresight or sufficient study on the part of the planners. This is particularly true in the case of school buildings, as is shown by numerous reports on school building programs. Such careless planning produces, among other things, various conditions in school systems. 1. Sites have been chosen without regard to their desirability from a standpoint of immediate environment, growth and population needs. 2. Small buildings have been constructed with greatly overlapping tributary areas. 3. Buildings have been erected which do not adequately safeguard the health and safety of pupils. 4. Traditional educational practice rather than the more recent trends of educational thinking and practice has dictated the space relationships and the sizes of buildings. 5. New school buildings have been erected without the possibility of making future additions, thus adding unnecessary cost to the school building program. 6. Because of the character, construction, inadequacy of planning, or faulty location, much money has been expended for buildings which could be used for but a few years and which proved to be poor investments. Such unsatisfactory results could very largely be avoided by the preparation of a carefully thought out building program, based on scientific investigation which would permit school boards to plan in terms of the larger policies of school administration, and to ignore private or political interference with the expenditure of school funds which are entrusted to them.

In making such a program, careful investigation should be made of all the factors involved or likely to

Complete Telephone Convenience . . . for Every type of Building



Telephones wherever they are needed . . . planned in advance . . . for efficiency, better appearance, and flexibility of service

PLANNING in advance for telephone convenience is important for every type of building . . . apartments, residences, factories, office structures.

For complete telephone convenience, telephone outlets should be sufficient in number, and so located as to bring the greatest comfort and ease in the use of the service.

Architects, especially, recognize the improvements that come from planning for telephone arrangements *in advance*. Better appearance. Protection for wires and apparatus. Service more easily matched to the immediate and ultimate requirements of users.

The Bell System is distributing two booklets containing general information and technical data, to guide architects and others in planning for those telephone arrangements which will give greatest convenience and satisfaction. In addition, your local Bell company is always glad to help you "custom fit" telephone facilities to individual building projects. If you have not received these booklets, or wish further information of any kind, telephone the nearest Business Office today.

AMERICAN TELEPHONE & TELEGRAPH CO. AND ASSOCIATED COMPANIES — BELL SYSTEM

have an influence on the construction and maintenance of schools in the community. In the first place, the existing school plant must be carefully investigated and analyzed. Conditions unfavorable to the pupils of the community as a whole must be noted, and the various schools may be rated on a percentage basis. In this way it may be decided what schools may be retained, which buildings altered and improved, and which, if any, must be condemned as unfit for use. By such an analysis much is learned regarding conditions that must be guarded against in planning new buildings. Another important branch of the study deals with the growth and distribution of the population, since it is in this way that it may be estimated what are the needs which must be met during the years the building must be used.

Since the school architect often acts as adviser to the school board in all matters connected with school buildings as well as actually planning the structures, it is quite essential that he should become familiar with the making of school building programs, and with the various factors on which they are based. Such knowledge can be gained by a study of the school building programs of such cities and towns as already have them. Unfortunately, these reports are not always readily available, and it is to overcome this difficulty that N. L. Engelhardt, Professor of Education, Teachers' College, Columbia University, has edited and published in a bound volume the school building programs of ten representative cities in the United States. These reports have been carefully selected in order to give, as nearly as possible, a complete cross section through the educational conditions for the whole country. The cities selected were: Lynn, Mass., an established New England industrial town; Watertown, N. Y., a wealthy trading and industrial center in the St. Lawrence valley; Fort Lee, N. J., lying on the Palisades just opposite New York; Paducah, Ky., a rapidly growing industrial community of the middle west; Greensboro, N. C., a thriving city of the Piedmont region; Augusta, Ga., a noted tourist, industrial and agricultural center; Jacksonville, Fla., one of the most important commercial points in the south; Beaumont, Tex., representative of the great southwest; West Aurora, Ill., industrial suburb of Chicago; and Rye, N. Y., a wealthy suburban community near New York. In the case of southern cities, school systems for both colored and white pupils are given consideration.

These ten reports represent school building conditions and needs in the various cities at the time the surveys were made. In each instance the survey has brought about significant changes in the local situation. With these programs as a model, it will be possible for school officials and advisers to make surveys of their own schools and prepare building programs for their communities which will lead to lasting benefit and improvement. The subject matter is well illustrated by maps showing methods of studying population distribution and the selection of advantageous sites for future buildings. There are also many illustrations of school buildings in the various cities, most of which serve to point out conditions which should be remedied. These, together with many tables and the text discussion, form the basis for an intelligent approach to the school building problem and will serve as a valuable reference book for any architect who in either a professional or a private capacity is concerned with planning and erection of school buildings.

Freedom
—*from oppressive maintenance*

Independence Hall—symbol of freedom from political oppression.

Dixon's *Industrial* Paints—symbol of freedom from oppressive maintenance.

Both seasoned by generations of time.

Dixon's Industrial paints have given Industry a new conception of paint service—ten—fifteen—twenty years of absolute protection. A service measured in terms of decades rather than in terms of years.

And now these paints may be obtained in fourteen different colors, light shades as well as dark. Each color, each drum of paint carries the responsibility of upholding Dixon's reputation for long life and quality.

Consider this when buying paint. This nation was not made in a day—the same is true of good protective paint.

Dixon also makes a complete line of Floor Paints for the protection of wood, composition, cement and concrete floors.

And we are now offering an additional service—that of matching special colors.

Bulletin 224-B

Paint Sales Division

Joseph Dixon Crucible Company

Jersey City D X N New Jersey

Established 1827

DIXON'S INDUSTRIAL PAINTS

Known for more than 65 years as Dixon's Silica-Graphite Paints

HOUSE PAINTING, GLAZING, PAPER HANGING AND WHITEWASHING. A Book for the Householder. By Alvah Horton Sabin. 196 pp., 4¾ x 7¼ ins. Price $1.80 Net. John Wiley & Sons, Inc., 440 Fourth Avenue, New York.

USE of paints, stains, varnishes and similar materials, perplexing even to most architects and writers of specifications, is generally completely baffling to home owners who attempt to use such materials themselves. To the experienced painter nothing probably appears so simple as to use these products to produce the desired result and to give the necessary wear, but many a home owner finds himself possessed of painted floors which refuse to dry, of varnish which no amount of heat will prevent from being sticky, or outside paint which is washed off after only a few rains.

This is the fourth edition of Mr. Sabin's work, "a book for the householder," but equally valuable to architects and the writers of specifications, to builders, and to others who use painting materials of any sort. It covers glazing, paper hanging, whitewashing, and other operations which ordinarily apply to structures of a residence character. "For every man, woman, and child in this country about two gallons of paint are used every year; and the relative amount is increasing. Paint is a necessity; its use is an economy; it is a means of sanitation; it helps us to keep clean; it keeps us warm in winter and dry in summer; it brings light into dark corners; it raises our assessments; the most ignorant enjoy its benefits; and even the most highly developed people, whose culture is so profound that they have forgotten all they ever learned at college, retain its appreciation. A subject so various in its uses, so universal in its appreciation, deserves attention,—and indeed it merits intelligent study. It is not proposed in this little book to enter largely into the theory of paint manufacture, nor to describe its use for carriage painting and the thousand and one purposes for which special paints and varnishes are made, but to tell simply and plainly the use of preservative coatings of one sort and another for the protection and ornament of common houses, as they are known, or should be, to every one of the author's fellow countrymen. An experience of many years in the manufacture and use of paints and varnishes is the foundation of such knowledge as may be set forth, and while on many points even experts disagree, it will be the intention to set forth fairly sound and safe practice." In 196 pages the author covers all the subjects likely to interest the home owner and deals with them in such a way that scarcely anyone could make a mistake in painting exteriors, interiors, floors or furniture, or in glazing and paper hanging. In fact he even deals with some matters which ordinarily do not concern the home owner. The author dwells sufficiently upon one of the chief of the many functions of paint, which is to act as a preservative, since it spreads over the surface painted a durable film which prevents the penetration of moisture that might cause decay. The use of stains, of course, involves a wholly different result, since the stain penetrates the material, where it is wood, and the coloring produced by the stain cannot be removed, though it may usually be hidden by using over it another stain of a darker color. The work abounds in data.

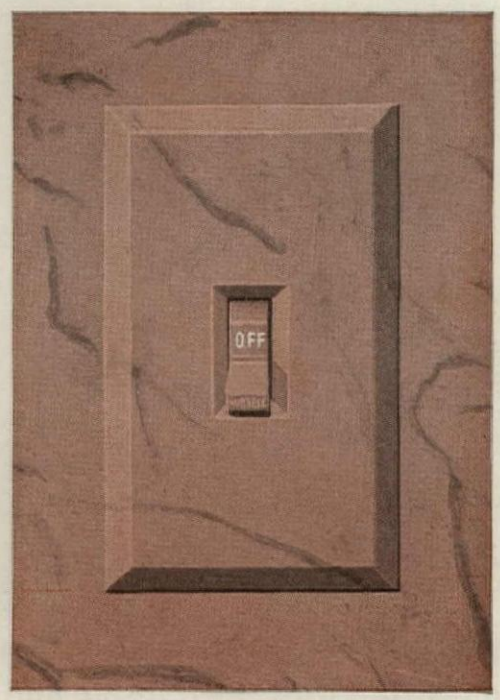
Be CERTAIN of perfectly aligned plates..

On uneven walls Screwless Plates align automatically

PERFECT alignment of Screwless Plates does not depend upon even walls or careful building-up. By specifying Hubbell Screwless Plates of Bakelite the architect can be certain that the appearance of a house or building will not be marred by plates which project awkwardly from the walls.

Screwless Plates must hug the walls closely. Perfect alignment on uneven walls is automatic... building-up unnecessary.

An exclusive feature, the Hubbell Metal Under-plate which is screwed to the switch or outlet, automatically brings the device flush with an uneven wall as it is fastened to the outlet box. Then the "dead-front" Screwless Plate of Bakelite is simply snapped fast to the Under-plate.

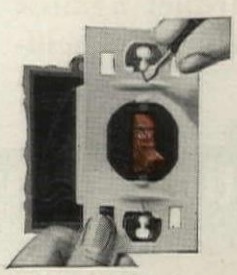


Through the development of a special plate finishing process, Hubbell can provide the architect with Screwless Plates which duplicate the color and material of the background to which they are affixed. Any wood, marble, textured plaster, or color tone can be faithfully reproduced. The architect need only supply specifications or sample of the material to be simulated.

Mail the coupon below to our nearest office for detailed information about Hubbell Screwless Plates.

HARVEY HUBBELL, INC.
BRIDGEPORT, CONN.

Boston, Mass., 176 Federal St., Atlanta, Georgia, H. C. Biglin, 138 Marietta St.; New York, N. Y., 122 East 42nd St.; Chicago, Illinois, 818 W. Washington St.; Denver, Colo., The Sales Service Co., 1109 Broadway; Philadelphia, Pa., Fifth St., Philadelphia Bourse, (Exhibition Dept.); San Francisco, Cal., Garnett Young & Co. 390 Fourth St.



1 Screw Metal Under-plate to switch — when wiring is done

HUBBELL *Screwless Plates*

Please send Hubbell Screwless Plate Bulletin

Name_____

Address_____

City and State_____

A. F.—6-29

2 Fasten switch to outlet box— no "building-up" necessary.

CONTENTS

THE ARCHITECTURAL FORUM

JUNE, 1929

Shop and Store Reference Number

PART ONE—ARCHITECTURAL DESIGN

PART TWO—ARCHITECTURAL ENGINEERING AND BUSINESS

PARKER MORSE HOOPER, A.I.A., Editor

KENNETH K. STOWELL, A.I.A., Associate Editor

Contributing Editors:

Harvey Wiley Corbett; Aymar Embury II; Charles G. Loring; Rexford Newcomb; C. Stanley Taylor; Alexander B. Trowbridge

Published Monthly by

NATIONAL BUILDING PUBLICATIONS

DIVISION OF NATIONAL TRADE JOURNALS, INC.

521 Fifth Avenue, New York

H. J. Redfield, President and Treasurer; Howard Myers, Vice Presi-dent and General Manager; Joseph E. Browne, Vice President; John Thomas Wilson, Vice President; C. Stanley Taylor, Vice President; James A. Rice, Vice President; Henry J. Brown, Jr., Secretary.

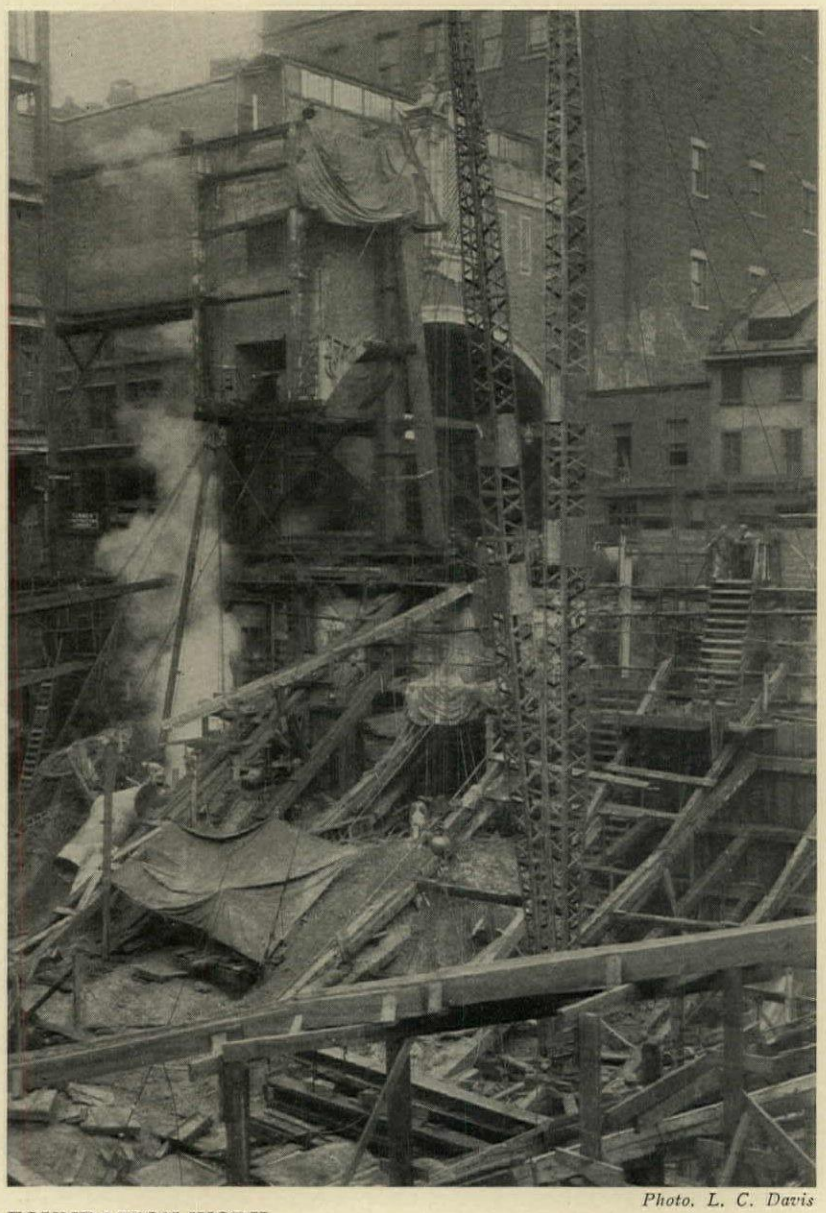


Photo. L. C. Davis

FOUNDATION WORK

STRAWBRIDGE & CLOTHIER DEPARTMENT STORE
PHILADELPHIA

SIMON & SIMON, ARCHITECTS

The Architectural Forum

THE
ARCHITECTURAL
FORUM
VOLUME L NUMBER SIX
JUNE 1929

MERCHANDISING AND BUILDING CONSTRUCTION

BY
ARTHUR T. NORTH

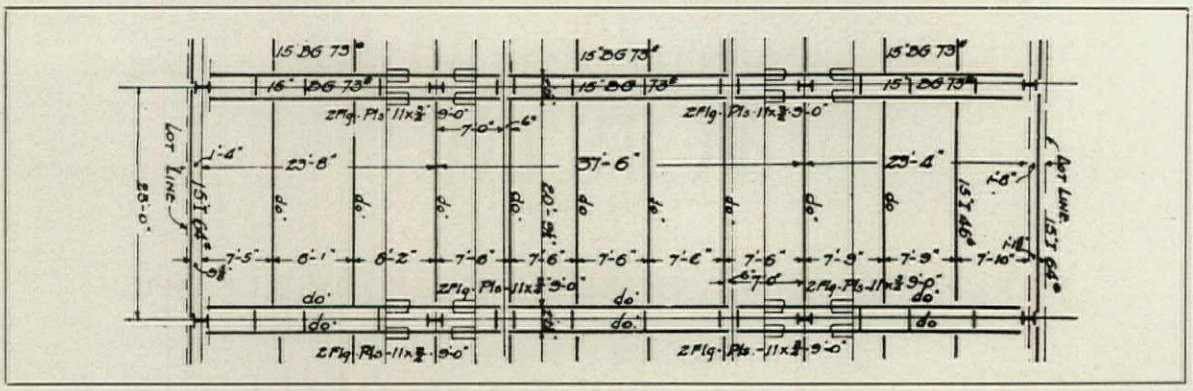
SUCCESSFUL merchandising is dependent upon an increasing and continued patronage due to what is commonly called "consumer loyalty." Patronage is highly susceptible to many influences both favorable and unfavorable. It is the ever-present problem of the merchant to provide favorable and to avoid unfavorable conditions, both of which, in a large degree, are influenced by the character of his building. Occupancy and structure must coördinate to secure maximum utility, and it follows that the necessities of the occupancy will determine the character of the building. The nature of the occupancy must be ascertained first, and merchandising is here defined as a contact between a buyer and a seller of merchandise which results in an exchange. There are certain conditions which facilitate this exchange, and many of them depend upon the character and functioning of the building. Of these, the more important requirements are intended to display the merchandise in a suitable and attractive manner and to provide rapid, comfortable and safe circulation of buyers within the building.

Illumination is one of the most important factors in the proper display of merchandise. The improvement in the design of show windows, show cases and display cabinets has been accompanied by a corresponding improvement in the type and effectiveness of artificial illumination, both resulting largely from the production of more valuable and beautiful merchandise. The general illumination of a store is very important, since it affects the first impression of the buyer upon entering, and it should be of sufficient intensity to produce a cheerful and inviting aspect. This effect is best secured with a high ceiling in which the beam and girder projections are of minimum size or eliminated entirely, and column spacings are made maximum. The general lighting units should be as few in number as possible and of such a kind as to not distract attention from the display plane or level. The specific illumination in show windows, show cases and display cabinets should be of much greater intensity, and the lighting units be concealed. The subordination of structural interferences with the general illumination adds immeasurably to the appearance of spaciousness and dignity of the store.

Buyer traffic is horizontal through aisles and vertical by stairs, ramps, elevators and escalators. Horizontal traffic is the more difficult to make rapid and comfortable because it is in opposite directions within the same aisle. The requisite aisle area is most effectively secured by the maximum elimination of columns and obstructions.

The most important structural features of a merchandising building are the height of the stories, the design of the ceiling, and the spacing and sizes of the columns. Consideration must be given also to the concealing or exposing of the automatic sprinkler system, if it be used. The treatment of these problems in a highly successful manner is illustrated here in their application to three commercial buildings. The mercantile building owned by L. M. Blumstein, Inc., New York, is L-shaped in plan with the principal stem 87′6″ wide and 200′0″ long, with the smaller stem used for the elevators, stairways, toilets and utility shafts and a very considerable display and sales area. The two rows of interior columns in the principal stem are spaced transversely 23′4″, 37′6″, and 23′8″, respectively, where three rows of interior columns would be used ordinarily. In the longitudinal direction the column spacing varies from 23′0″ to 25′0″. The floor panels are generally 23′0″ x 37′6″ and continue through the center of the store. The floor beams are spaced from 7′6″ to 8′2″ on centers and have a depth of 15″. These floor beams cope into and flush with girders of the same depth. These girders are made of two heavy 15″ beams which pass on either side of the interior columns and project 7′0″ beyond the center of the column into the center span, leaving a span of 23′6″ in this span to be filled with two beams of equal size and weight designed as simple beams suspended on the ends of the cantilever girders.

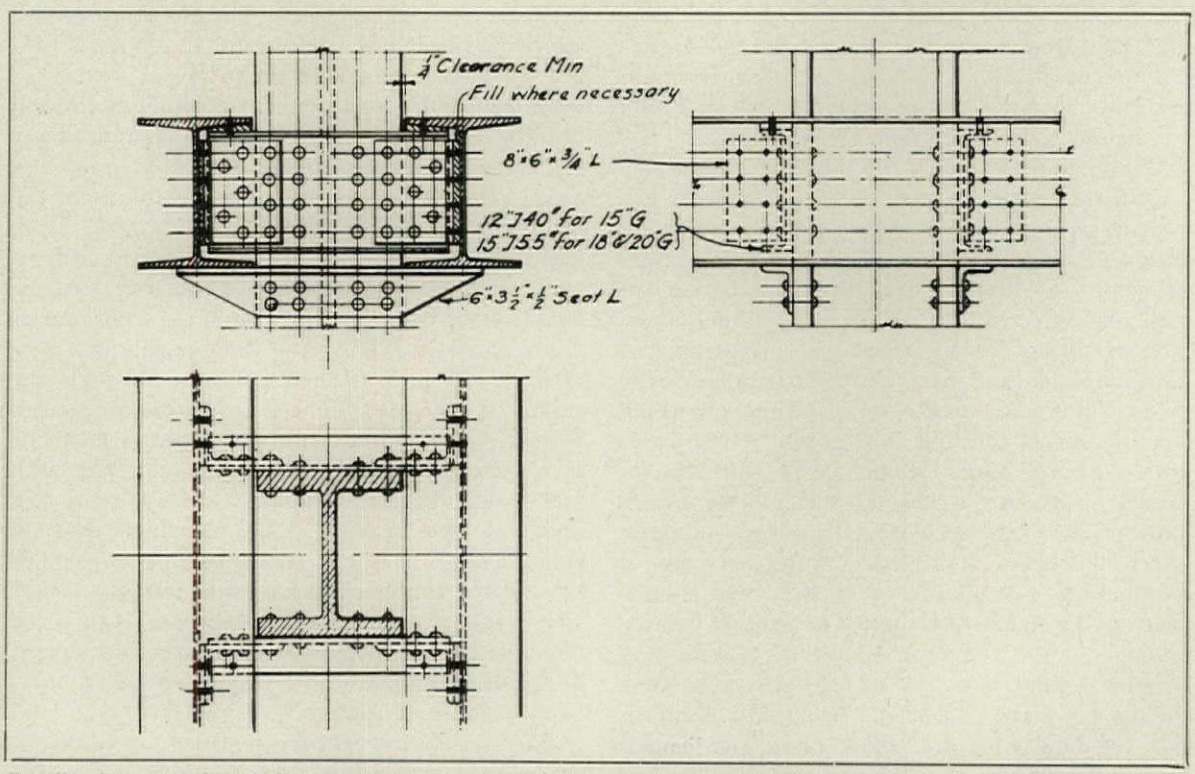
The continuous cantilever girders are each reinforced at the columns by two 9″ x ¾″ x 9′0″ flange plates required to resist the bending mo-



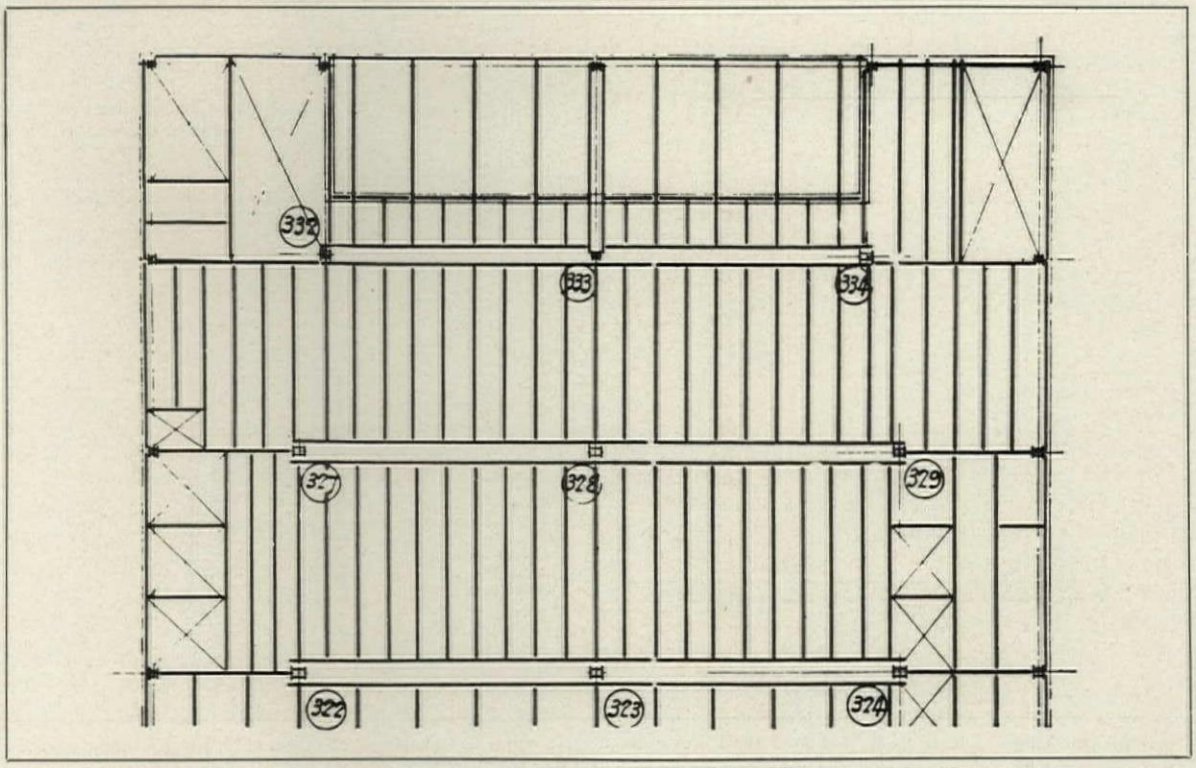
Portion of Plan, Showing Cantilever Type Girder Framing L. M. Blumstein, Inc., Store, New York
Robert D. Kohn and Charles Butler, Architects Associated

ment at place. The girders are supported by channel diaphragms which are riveted to the columns. The spaces between the girders, adjacent to the columns, are utilized for the passage of ventilating ducts, pipes and conduits that are incorporated in the fireproofing of the columns. The uniform depth of the beams and girders makes possible an unbroken ceiling which increases the appearance of spaciousness and aids in the distribution of the illumination. The automatic sprinkler system piping is concealed in the floor construction and is evidenced only by the unobtrusive projection of the inverted heads.

A similar but heavier construction is found in that portion of the store of R. H. Macy & Company, Inc., which was erected in 1923. The ground area covers a space 125′0″ wide and 197′6″ long. The transverse column spacing, east to west, is 18′11″, 41′11″, 40′10″ and 20′0″, and 25′0″ to 30′0″ is the longitudinal column spacing. The narrow side bays are used largely for elevators, escalators and utility shafts. This arrangement provides a central space of about 83′0″ x 195′0″ in which there are only six interior columns, the floor bays being about 30′0″ x 41′0″ in size. In general, the floor beams are 15″ deep, reinforced with 7″ wide coverplates of different thicknesses, and spaced about 8′0″ apart. It was decided to use girders of comparatively small depeth so that they would project about 6″ below the suspended ceiling



Details of Typical Connections for Cantilever Construction Shown in the Plan at Top of Page. Seat Angles Are Not Designed to Carry the Load, Which Is Supported by Channel Diaphragms



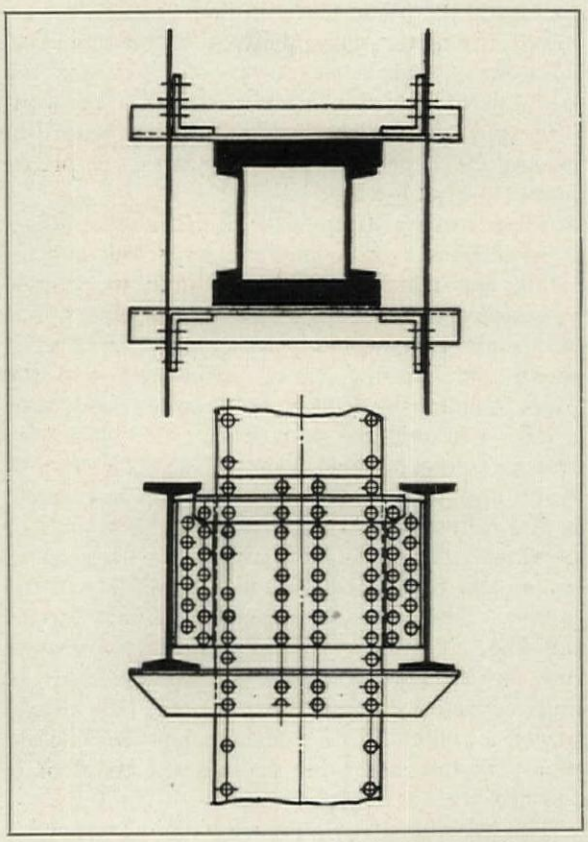
Framing Plan Showing Elevator Shafts; Large Shafts for Motor Truck Elevators, R. H. Macy & Company Store, New York

Robert D. Kohn & Associates, Architects

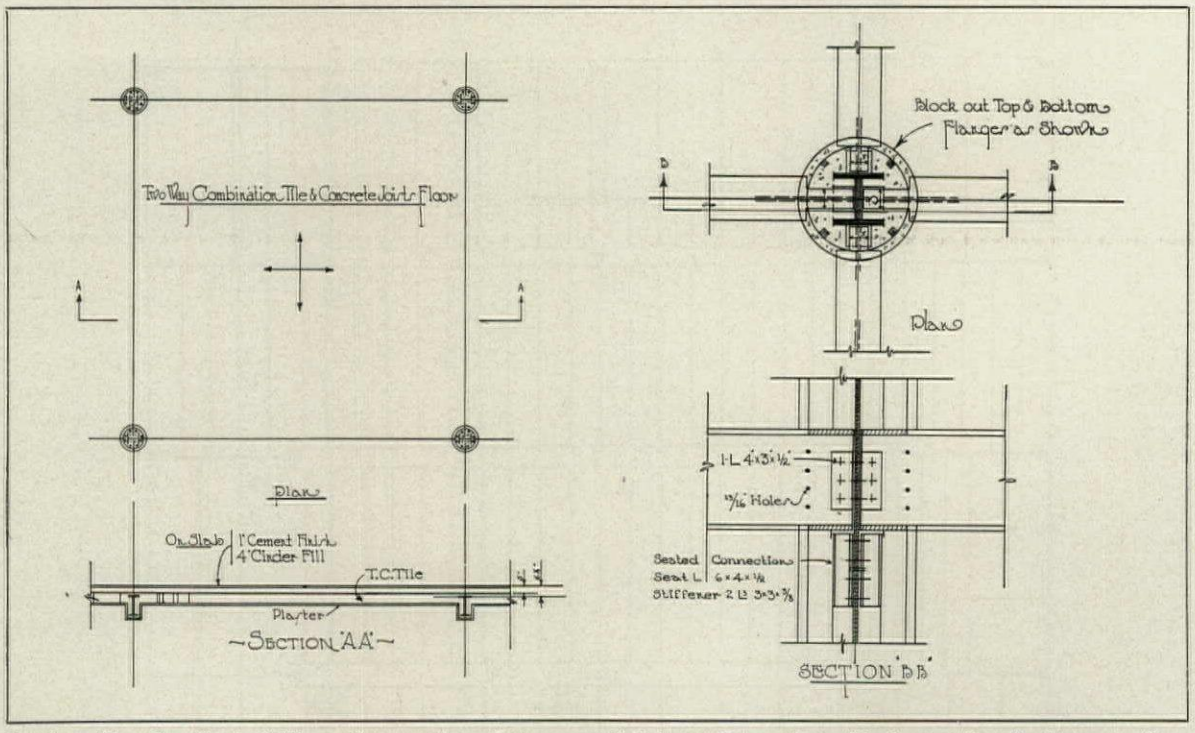
level. These girders are made of two 24″ beams placed on either side of the supporting columns and are 3′1″ apart, center to center. They are reinforced with 10″ wide coverplates of various thicknesses and lengths. Between these girder beams are placed plate and angle diaphragm separators, and the girders are attached to and supported on the columns by a heavy plate and angle diaphragm.

The girder-column connections are designed to take their proportion of the wind-load stresses so as to eliminate many of the undesirable features usually introduced in wind-bracing designs. This type of connection eliminates the usual gusset and angle bracket for large girders. In this building an angle is riveted to the column on which rests the girder for erection purposes only. This type of connection eliminates those structural details which commonly project materially beyond the column and interfere with the architectural treatment of the column head.

There is a cantilever projection of the girders of about 7′9″ beyond the center of the central row of columns, the end of which supports girder beams of similar depth designed as simple beams. Sprinkler mains are passed through holes in the webs of the girders around which suitable reinforcing plates are riveted. A ceiling which conceals all of the horizontal pipes of the automatic sprinkler system, is suspended below the floor beams. The sprinkler heads are inverted in the



Typical Cantilever Connection, R. H. Macy & Company Store. Seat Angles Are Not Figured to Carry Load, Which Is Supported by Plate and Angle Diaphragms



Sections Showing Typical Floor Construction, Columns and Column Connections, Blackmore Danzig Company, Inc., Store, Elmira

Robert D. Kohn and John J. Knight, Architects Associated

usual manner and project below the ceiling. On the ninth, tenth and eleventh floors spaces are allowed for motor truck delivery of merchandise, adjacent to truck elevators. To increase the strength of the floor slabs to support the concentrated loads of the trucks, the floor beams, in general 20″ deep without cover plates, are placed more closely together.

The structural frame in each of these buildings is so designed as to contribute a spacious and inviting appearance to the store, and to provide adequate aisle space for the use of customers. The Blumstein building was designed by Robert D. Kohn and Charles Butler, associated, and the Macy building by Robert D. Kohn & Associates.

The store building designed for the Blackmore Danzig Company, Inc., Elmira, N. Y., Robert D. Kohn and John J. Knight, architects associated, is of a different type of construction than the two previously described. This building is irregular in shape, and the floor panels average 20′0″ x 20′0″ in size. There are no suspended ceilings in this building. The floor framing consists of girders only, which support a two-way combination tile and concrete joist floor construction. On this is placed a cinder fill of sufficient depth to enclose pipes, conduits and other utilities and the floor is finished with a 1″ cement top.

The columns are of the combination type with a rolled steel H-shaped core encased in spirally hooped concrete reinforced with vertical bars. In the lower stories the steel core is reinforced with two or four angles riveted to the web. The flanges of the girders extending from the spiral hooping to the column are coped to a width of 3″ to permit the satisfactory depositing and rodding of the concrete. The lower tier of columns is in four-story lengths, extending from the basement floor to a point above the fourth floor. These lengths vary from 71′9″ to 77′0″, with those at the elevator shafts 83′9″ long. Three stories and basement are to be first constructed, with provision made for future additional stories. As the steel cores are of uniform section, it necessitated the angle reinforcing in the lower stories as just described. The spiral hooping was slipped over the column in proper sequence before erection and raised and secured in position as the floor girders were erected. These combination concrete and steel columns are designed conforming to the specification of the American Concrete Institute. Eugene W. Stern was associated on all these buildings with the architects, Robert D. Kohn & Associates, as consulting structural engineer.

Merchandising in its many forms is one of the three fundamental elements of commerce which are, in their logical order, manufacturing, transportation and merchandising. They are interdependent, and it is their coincident development that has within a few generations stabilized and expanded American merchandising from that of the pack peddler to the contemporary store.

MECHANICAL EQUIPMENT OF THE DEPARTMENT STORE

BY

E. E. ASHLEY, JR.*

THE store merchant of necessity has recognized the fact that, incidental to the success of his business, the mechanical equipment of his building requires careful design and attention. There is nothing in connection with the mechanical equipment of the modern store building that is a mystery. Consideration must be given to engineering fitness rather than to "sales arguments" when selecting the apparatus and equipment that are required. In building the modern store there are about 50 different mechanical trades to be considered, the major of these being those connected with transportation facilities for persons, packages and cash. These would cover elevators, escalators, spiral chutes, belts and conveyors. Heating and ventilation, sanitation and electrical work are other important considerations. In the modern store building about 30 per cent of the total cost goes into the mechanical equipment, not including in this figure any incidental motorized equipment that goes into the fixturizing; nor does it include the outfitting of such departments as luncheonettes, soda fountains or beauty parlors.

Considering the amount of the investment and the continually increasing cost of labor, it is necessary to conserve every inch of space for selling, and it becomes the duty of the mechanical engineer to think of this in his planning. Too much stress cannot be put on the necessity for providing adequate transportation facilities and proper light and ventilation, for without these the value of the selling space is quickly reduced. It is only within recent years that serious consideration has been given to mechanical equipment.

VERTICAL TRANSPORTATION

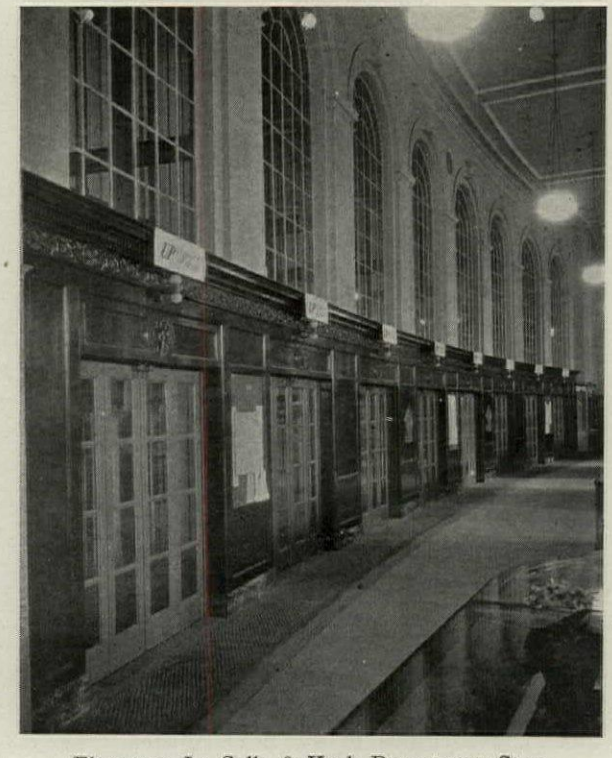
The R. H. Macy & Company store, when at 14th Street, New York, had a floor area of approximately 100,000 square feet and used, I believe, eight slow-speed, hydraulic elevators with an average capacity of from 12 to 15 persons. There were, on an average from 20,000 to 25,000 persons entering this store during a busy day, as compared with about 250,000 now entering the present 34th Street store in a similar day. For purposes of determining the transportation facilities, we use the term "transportation area," and this means the area of the building, above or below the first floor, served by elevators and escalators, and used for selling or executive purposes. Until midtown store development, little consideration was given to the scientific study of the transportation problem. The location of entrances, the width of aisles, or the position of elevators was determined more by the architect's ideas of pleasing design than with any thought to the traffic problem. In fact, it has only been quite recently that this problem has been seriously studied.

Again referring to the old Macy store at 14th Street, the sales traffic density for this store was about one person for every 80 square feet of area, whereas, when the 34th Street store was opened, facilities for traffic were based on a density of one person to 32 square feet. This has been gradually increased until today Macy's has facilities for a sales density of about one person to every 19 square feet and, in talking with the managers, it is found to be their belief that they have not as yet reached the density that can be economically handled in their building. It is quite probable that they will increase their transportation facilities in the near future. This is an exceptional example, and it cannot be used as a criterion for estimating transportation facilities necessary for the average store building.

For the general type of department store structure, it is probably safe to assume a density ratio of one person to 25 square feet of transportation area for all floors above the first, and where the basement is used as an under-priced store, a ratio of one person to every 7 square feet. This latter figure is a result of an investigation of the traffic in some of the most successful underpriced basement stores, and it can be assumed to be a proper figure for similar spaces. However, there are many instances where these requirements, owing to the type or the variety of merchandise sold, will not be necessary. For instance, in a specialty shop, or in a store where the average sales check is very high, there will be no necessity of providing transportation facilities for such densities. In the latter type of building, a density ratio of one person to 40 square feet would suffice.

Each store building is a problem in itself, and it requires very careful analysis. The height of the building and the individual floor areas have considerable effect on the individual requirements, and it is not possible to compare the facilities of stores in one city with those in another, because of the fact that the customs of the people or the shopping habits of the people are very often entirely different. Generally speaking, in a well fixtured store, 70 per cent of the entering people will go to the upper floors of the

*Electrical and Mechanical Engineer, Firm of Starrett & Van Vleck



Elevators, La Salle & Koch Department Store, Toledo

Starrett & Van Vleck, Architects

building, and the peak requirements for an hour will be about 20 per cent of the total traffic of the day. The wide-awake merchant is acquainted with the fact that without adequate transportation facilities his store is going to lose trade. Several instances can be given where less than 45 per cent of those entering left the ground floor because of inadequate elevator service. The location of the transportation equipment is as important as the amount of equipment, and to locate elevators or escalators poorly is just as bad as not to provide enough of them. There are instances where buildings are over-equipped with elevators, but where people still complain of the lack of transportation facilities because of the fact that the public cannot find them or because they are so located that only a few of the elevators handle the bulk of the traffic.

There are several important considerations which must be known before the number and the locations of the elevators and escalators can be determined. Among them are:

(a) Type of store.
(b) Character of business.
(c) Relation of building to those of competitors.
(d) Local street traffic conditions.
(e) The general arrangement of selling departments on the upper floors.
(f) Where remodeling or addition to a building is being planned, the traffic count of persons entering the store constitutes a factor.
(g) Where in a new location, the traffic passing the contemplated building plot must be considered.
(h) The percentages of people entering the various entrances.

With these conditions or the majority of them known, it is quite simple to establish the traffic densities, and knowing this, together with the size of the transportation area, the amount of equipment can then be decided upon.

Where to place the elevator equipment is another problem. The size of the plot and the locations of the entrances, which should be placed with adequate regard to street traffic, and even the general arrangement of fixturizing and the locations of the distributory aisles, should be taken into consideration. The positions of the elevators or escalators should be such as to prevent traffic jams resulting in loss of business on the first or the ground floor, and planned with regard to the distance to be traveled from the elevators to the various departments on the upper floors. They should be so located as to be easily seen from the principal entrances. For a rough calculation, a modern type elevator, such as is used in a department store, an elevator having a capacity of about 22 persons, will handle about 400 persons an hour in the average ten-story building, and will take about 4½ minutes for the round trip.

With the total patronage known, it is easy to determine the number of elevator cars needed. For practical reasons, it is not advisable to arrange more than eight cars in one group, and preferably not more than six. When the groups are larger than six, there is too much time lost due to the waiting passengers having to travel from one end of the bank to the other, which, in the case of eight cars, would be approximately 100 feet. This not only delays the elevator service but is vexatious to the customers. Where more than eight cars are necessary, it is advisable to arrange them in two independent banks, and, if the floor area will permit, to arrange these banks or groups facing each other in an alignment. This is not always practical, however, in the shallow or narrow plot.

Escalators. Where more than eight cars are required for passenger service, consideration should be given to the installation of escalators for the efficient handling of the traffic, which then ceases to become a matter purely for elevators and is essentially an escalator problem. Escalators are the most efficient pieces of equipment for handling heavy traffic. For comparison, the elevator handles an average of 400 persons per hour, whereas the escalator, depending on its width, handles from 4,000 to 10,000 persons an hour. When the amount of traffic be-

comes sufficient to warrant the installation of escalators, it is advisable to assume that 70 per cent of the traffic will be handled by them, and that 30 per cent will use the elevators. The escalator should be located in direct line with the heaviest traffic. The fixture architect will probably criticize this location, since it will break up, to some extent, his arrangement of fixturizing on the first floor, but the escalator, to be efficient, should be so located. Escalators should always be installed in pairs so as to accommodate both up and down traffic. An escalator going in one direction only impairs the general transportation facilities of the building, and instead of reducing the burden on the elevators, it increases it. The general arrangement of escalators should provide for a continual flow of traffic from floor to floor, avoiding the long walk from the head of one escalator to the foot of the next. In other words, if the landing is on the second floor toward the center of the building, the escalator to the third floor should start adjacent to this landing point. There are two ways of accomplishing this,—by using either the "scissor" type or the "parallel" type, the latter being in the center of the area or else in between two sets of machines. Where local laws do not make it obligatory to enclose the escalator, it should be left open so as to give the customer every opportunity to look over the selling area. Where it is necessary to enclose the escalator, as much glass as will be permitted should be employed.

Elevator Cabs and Equipment. The size of the elevator cabs is important. They should be shallow and wide; preferably about three fifths as deep as they are wide, and the doors should be center-opening so as to permit the largest possible entrance for quick loading and unloading. The doors should be about four fifths of the total width of the car. This will permit a return on the car for the operator's position. The gates on the car should likewise be center-opening, and, with the modern type of elevator, with its automatically-controlled levering, the doors and the gates should be power-actuated and automatically-controlled so as to open on the arrival of the car and close on its departure.

Too much care cannot be taken in the selection of elevator equipment, for there is no demand on elevator service as severe as that of the department store. High speed is not essential, but speeds between 400 and 500 seem advisable. Of course, this is based on the assumption that the average mercantile building is not over ten stories high. Taking into consideration the type of service and the speeds to be maintained, the gearless machine is the most suitable and, with the adoption of variable voltage, it can be used irrespective of the type of electric current provided.

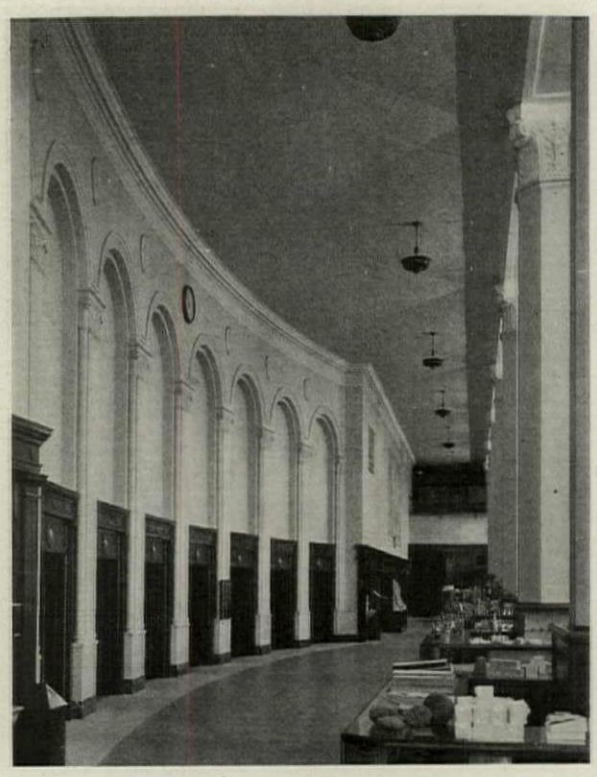
Elevator Arrangement, Kresge Department Store, Newark

Starrett & Van Vleck, Architects

The question of service in store elevators is one that can be answered only by careful study of the individual requirements of the building, for there are so many different methods being employed in the warehousing and storing of stock, and in the handling of incoming and outgoing merchandise and freight, that no set rules can be made for this type of service. Where the customer traffic is handled by elevators alone, it is essential that some cars be provided to handle employes. These same cars can be utilized for the carrying of stock merchandise. The freight cars should be so located as to handle the freight with despatch from the point of entrance to the receiving and marking rooms, and should be liberal in size and capacity. While no set rule can be made for the type of equipment to be used for this service, it is advisable and most practical to standardize on the type of equipment, and to equip all service and store elevators so that they can, in emergency, handle passenger traffic.

HEATING AND VENTILATING

With the planning of the large store building, the problem of ventilation becomes serious, particularly as the basements and first floors are practically hermetically sealed. The two elements which probably cause more fatigue and nervousness, not only to the customer but to the worker as well, are improper ventilation and improper lighting. With the general arrangement of the ground floor, having show windows and en-



Elevators, Davison-Paxon Co., Atlanta
Starrett & Van Vleck, Architects
Hentz, Reid & Adler, Associated

trances practically closing up the entire periphery of the structure, the only practical way of taking care of the ventilation of the selling space is to supply fresh air mechanically. The air is the medium for heating this space in the winter and for cooling the area in the summer.

Duct Work. How to provide space for the ventilating ducts must be carefully studied so as to avoid the loss of valuable selling space. Very often ducts above the show windows for handling the fresh air, and exhaust ducts located in the stock cases can be so installed as to make a very good arrangement. With the introduction of air-conditioning or cooling for the summer, it is necessary to re-circulate approximately 60 per cent of the air, thus requiring considerable additional duct work to bring all the ducts back to the fan rooms. These latter ducts, of necessity, could be run on the ceiling of the basement. There is an objection to this, however, in that every foot added to the thickness of the first floor means that the customers going to the basement have to travel that additional distance. In some instances it has been found practical to excavate below the basement and to run all the ducts in tunnels below the floor; then to have them come up on the columns or sidewalks to the ceiling of the first floor.

The tendency in the most recently planned buildings is to provide air-conditioning equipment to condition the air of the first floor and basement and, in some instances, also to condition the air in beauty parlors and restaurants. It is my decided opinion that this is only the beginning of the application of air conditioning in store buildings, and I believe that within the next ten years store buildings will be air-conditioned throughout. Where air conditioning has been installed, it has been found that there is less fatigue or illness among the workers, and that there is actually more merchandise being sold. People are sure to go to the building in which it is most comfortable to shop. The problem of the ventilation of the average first floor and basement is affected by the traffic as well as by the tremendous amount of heat given off by both the general lighting and the lighting of show cases. The fresh air inlet is very often carried to the roof and, if not properly located, pulls down fumes and smoke from adjacent chimneys.

Vestibules. The problem of the heating of the vestibules is very difficult. With the amount of traffic coming in and going out, it is almost impossible, without the use of revolving doors, to prevent the inrush of cold air from the street. In the middle west practically all of the store buildings are so equipped. With the use of the revolving door, the depth of the vestibule can be materially reduced. There are some criticisms, however, as to their use, the principal objection being the inconvenience to women with children and to those carrying packages. They reduce or regulate the amount of traffic to be handled during a given time, the average revolving door handling about 1,500 persons per hour.

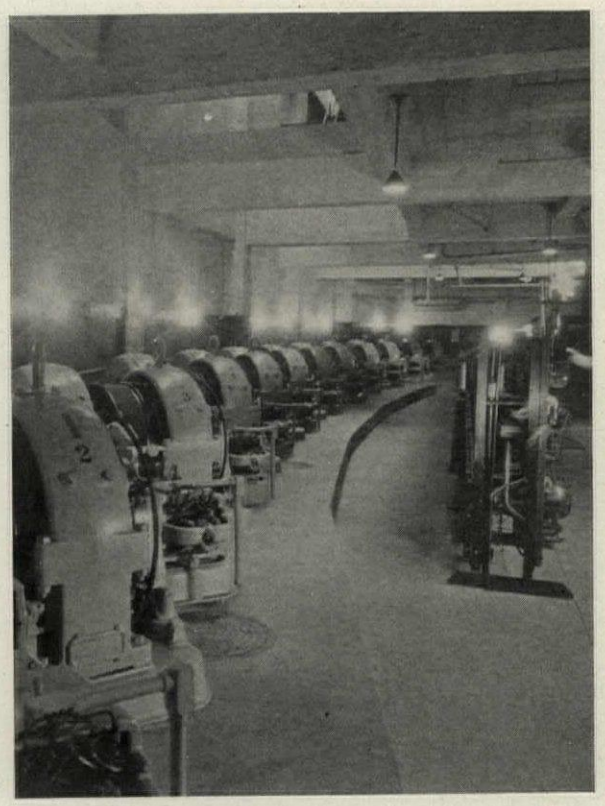
Where revolving doors are not used, probably the best method of handling the problem is to make the vestibule as large as possible with three sets of doors, and to provide a hot-blast system of heating. The larger the vestibule, the simpler becomes the heating problem. It will simplify the problem if the interior set of doors does not parallel the entering doors. In other words, they can be set at an angle so as to deflect the inrush of air drafts. If this cannot be done, it is advisable to arrange them so that screens can be put directly inside of the vestibule.

Thermostatic Control. With the ever-increasing cost of fuel and labor, careful study of the heating requirements should be made. It will probably be found economical, especially in larger stores, to provide thermostatic control of the direct radiation for the heating of the upper floors and for the control of the tempered air for the first floor and basement. With the large areas above the first floor, it is very often necessary to provide exhaust ventilation for the inte-

rior sections, for it will be found that due to lack of circulation the air may become quite foul. All boiler rooms, locker rooms and workrooms should be thoroughly ventilated by mechanical means; irrespective of how many windows there are, they will not be opened in the cold months.

If street steam is available, there is the question of whether or not it is advisable to install a boiler plant, with the high cost of fuel, the high cost of labor, and the inconvenience of handling fuel etc., together with the value of the space necessary. It then becomes an economic problem whether it is not advisable to abandon the use of a plant and to utilize the street service. Each individual case, however, must be worked out on the basis of its particular conditions.

The arrangement of utilities, such as electric control panels on various floors, the sprinkler control valves, clocks, dismissal and executive calls, needs careful thought. One of the most practical plans seems to be to use a shaft adjacent to the stairways, and to place the electric panel inside so as to be accessible from the selling area of the department store. It is also well to provide a cabinet with a glass door in the stairway, and to place in the cabinet the hose outlet, fire extinguisher and sprinkler control valve.



Elevator Machinery, Saks-Fifth Avenue, New York
Starrett & Van Vleck, Architects

THE SPRINKLER SYSTEM

The purpose of a sprinkler installation is to afford protection against fire, and it should be so considered. It is not purely a means of reduction in insurance rate, but for the protection against interruption of business. Care should be taken in planning sprinkler piping to avoid all unnecessary, excessively long runs, offsets and other complications which reduce the effectiveness of the system. The "wet" type system should never be installed in any location where there is even a remote chance of its freezing. Often the unexpected happens, and either the system is ineffective in case of fire or a heavy water damage results when the frozen water thaws out. The system is widely used, generally perhaps because a dry system cannot be run concealed, as is the practice in better buildings.

The present tendency is to conceal all sprinkler piping. Generally these pipes are run in behind the furred ceiling; occasionally they are run in the floor fill. The latter method should not be encouraged, as it is very difficult to maintain piping, and the method does not lend itself to expansion or alteration. To avoid excessive furring, the girder beams are drilled so that the sprinkler pipes may pass through them. Sometimes considerable objection is raised to the use of dry systems in show windows, which is required owing to the likelihood of sprinklers of the wet type freezing in unprotected or unheated windows. The architect claims that the exposed piping ruins his decorative ceiling. By careful arrangement of heads and piping, however, they can be so placed as to make their detection difficult. In fact, how many persons looking at a show window can tell the kind of ceiling, or whether or not there are pipes in it?

The sprinkler system requires considerable water storage in tanks of the pressure type, which can be placed in the penthouse adjacent to the elevator equipment. This is preferable to using the ugly gravity type placed above the building, which is not only unsightly but difficult to maintain. The layout of sprinkler systems must be flexible to permit of adjustment for the rearrangement of partitions, the location of belts, conveyors and similar equipment, and it is advisable, in sizing the piping, to take these factors into consideration. There should be a special arrangement for flooding such places as rubbish and wastepaper chutes, ammonia compressor rooms, etc., and to amply protect the paper-sorting, packing-paper and excelsior storage houses, so that in case of fire the smoke will not penetrate to the rest of the building. It would seem desirable to use on the doors to such rooms thermal releases so that a sudden change in room

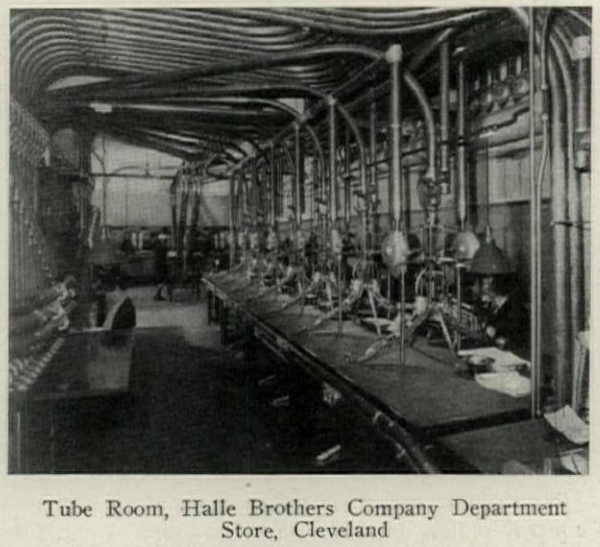
temperature would immediately close the doors, rather than to use the somewhat old type fuse link which takes more time before acting. The thermal release is a very good device to use in connection with the doors at the head of escalator enclosures. This allows of the doors being automatically held open, and closed in case of danger,—allowing free access at all times.

Fire Protection. The general protection of all connecting openings between floors is important, as this is one of the sources of much trouble and raises the insurance rate. This applies particularly to the sheet metal duct work of the ventilating systems, which should always be provided with fire dampers where they go from one fire area to another. The shafts for piping and electric raceways for pneumatic tubes or plumbing stacks should be ample in size to allow ready access to all pipes, but they should be protected by fire cutoffs if a severe penalty in size of insurance rates is to be avoided. Care must also be exercised in the construction of elevator shafts and the doors of such enclosures. Some underwriters require vent openings from the tops of the shafts if they are cut off from the machine rooms by concrete slabs, which, of course, is a necessity with modern chemical equipment.

CONVEYORS AND PNEUMATIC TUBES

The question is often raised as to why one should include such equipment as conveyors, belts and pneumatic tubes in general construction

Pneumatic Tube Room, Davison-Paxon Co.
Starrett & Van Vleck, Architects
Hentz, Reid & Adler, Associated



Tube Room, Halle Brothers Company Department Store, Cleveland
Walker & Weeks, Architects

work. The answer is that for all of these kinds of work certain clearances, shafts, and arrangements of openings in floors, and sometimes the shifting of structural members of the building require checking, and in order to avoid confusion, delay and unnecessary changes in other kinds of mechanical work, it is wise to have it designed and installed with the general construction, putting the responsibility for piping installation up to the general contractor.

Whether the building should have a pneumatic tube system or a cash register system depends entirely on the wishes of the management. However, irrespective of the system selected for the financial transactions, there is still a large field for the use of the pneumatic tube in the transmission of messages, orders or correspondence, and it will pay for its installation cost in the reduction in the number of messengers required and in time saved. The general tube used in department store service is 2¼ inches in diameter, but for messenger service tubes as large as 4 inches by 7 inches may be used. These will handle carriers which, when loaded, weigh about 14 pounds. There are a great many applications of the tube system to reducing operation costs.

The pneumatic tube system requires the installation of tubes to the various departments and counters. These terminate in a central station, which is divided into two parts,—one for handling cash transactions and the other for credit authorization. Sometimes the credit section of the desk is placed at a distance from the cash section. That is, it may be in the credit department, which is placed on an upper floor of the building. Generally, for the most rapid service, the cash desk is located on the basement floor or as near the first floor as possible to minimize the travel of the carriers from the first

floor stations. There are many points in favor of this system: that of central control of all cash; silent authorization; and the saving in the work of cashiers. There is also the fact that with tubes there are many other services to which they can be put,—for orders and messenger service. In some stores there is a combination system, using the tube system throughout and supplementing it with cash registers convenient for the very active sections in the under-priced shops and first floors.

Merchandise Handling. The merchant of today is watching carefully every improvement which will reduce operating costs, particularly in the handling of in- and out-going merchandise. The problem of handling merchandise will vary according to the location of the building. In some locations, the bulk of the merchandise is received from the railroad freight yard or dock. In others, it is delivered from the manufacturer's or jobber's warehouse or from the merchant's own warehouse, and the facilities for handling the merchandise will vary. The elevator equipment must be proportioned accordingly. A little care in arranging the size of an elevator will not only add to the efficiency of operation, but to the economy of space as well.

The majority of store owners use the upper floors of buildings for receiving, re-marking and stocking merchandise, except where the stock is carried in warehouses. This means that all the merchandise must be transferred from the stockrooms to various departments throughout the building. This distribution may be handled by elevators, dumbwaiters and spiral chutes, or, generally, by a combination of elevators and spirals. In some cases dumbwaiters are used in place of spiral chutes. The objection is sometimes made that merchandise may be damaged in a spiral chute. This may be true if the merchandise is sent down in a carton box without first being placed in a container or a bag to protect it against the rubbing it would receive while passing down the chute. Some chutes have been designed with what are known as "switch outlets" on several floors, and should a package hit one of these, it is very likely to become damaged. It is possible, however, to design a chute with as many as three blades, allocating the blades to various floors. Properly designed chutes may be very effective, and require little or no maintenance or operating power. Bulk merchandise is generally handled on wheelers or in hampers on the merchandise elevators.

Stockroom and Delivery. There is a growing tendency, owing to the value of space in the store building, to reduce stockroom areas to a minimum, carrying all merchandise in the warehouse, and shipping or delivering from the warehouse all merchandise except that which the customers take with them. Practically all furniture and household supplies are shipped by this method, only samples being kept in the store. This system materially simplifies the delivery problem from the store.

The problem of handling the out-going or sold merchandise involves several problems,—that of checking, authorizing (if on a charge account basis), wrapping, routing, and delivering. There are two methods of handling the out-going merchandise: one where the packages are clerk-wrapped (wrapped by the clerk selling the merchandise); and the other where they are central-wrapped. Where the latter system is used, the bulk of the merchandise is sent, after its sale, to a central wrapping department. With this system, of course, there is a certain amount of merchandise taken out by customers which, of necessity, is clerk-wrapped. Generally all merchandise on the first floor is central-wrapped with the exception of that taken out by the customer. The packages from the first floor are collected on belts which are hung from the basement ceiling and connected with a tube or cash desk in the rear fixture in the accounting department or square. With the central-wrapped system, the merchandise is gathered in hampers, bags or baskets and sent to the central-wrap. Where china and glassware are sold, it is very often arranged so that the packing accommodations, to-

Package Delivery Room, Davison-Paxon Co.
Starrett & Van Vleck, Architects
Hentz, Reid & Adler, Associated

gether with excelsior vaults, are located adjacently to the department, thereby reducing, to a minimum, the amount of breakage. Where furniture is carried and shipped from a store, the finishing and packing room is likewise located adjacently to the department. The tendency, however, is to handle as much as possible of bulk material directly from the warehouse, selling from samples entirely.

Delivery Cars. With the increasing restrictions governing the system of using streets for the parking of automobiles, it becomes necessary to either resort to the route delivery system, or to arrange it so that delivery cars may be taken directly within the building and loaded there. A New York department store uses a system in which the cars are all fitted with cartons just the size of the bodies of the cars. These cartons are unloaded onto special elevators which carry them to the delivery concourse within the building for loading and unloading. Generally these are left in the evening, and the car is sent to the garage. In the morning the car calls and collects the carton, which, in the meantime, has been loaded and is waiting to be delivered.

Package Routing. In collecting packages from the first floor, instead of using messengers and porters, a series of belts is provided on the basement ceiling. These belts are connected with the wrapping or cash desk in each department. After the packages have been wrapped and addressed, they continue on a belt to the inspection and authorization department, and then on to the routing table, where the delivery route number is placed on each package. From there they are tossed onto the delivery belt and then go to the sheet writers' bin, where the delivery sheets are written up. From here they are passed on to the delivery bin to be loaded onto the delivery truck. The packages from the upper floors of the building are generally placed in a delivery blade of the spiral chutes, which discharge on belts and are carried to the central wrapper, following the same route as that for the first floor. For large organizations, where there are many packages, it is the practice to provide two sets of blades in the spiral chutes,—one for semi-wrapped and one for wrapped packages,—so that the wrapped packages are taken direct to the authorizing and writing tables. Mail and express packages are separated at this table.

The question of the value of space used for delivery equipment has caused several stores to remove it entirely from their buildings, using in-

SUMMARY OF MECHANICAL EQUIPMENT FOR L.S. PLAUT #1 - NEWARK N.J. CUBAGE — 5,250,000 CU.FT. FLOOR AREA — 23,700 #.

HEATING & VENTILATING

DIRECT RADIATION	FLOOR	BASE.	1ST	MEZZ.	2	3	4	5	6	7	8	9	10	P.H.	TOTALS.
	RADIATORS	1	6	5	26	27	27	28	26	26	24	23	23	11	253
	#	45	474	250	1971	1972	1972	1972	1972	1972	1940	1860	1541	158	18,699

INDIRECT RADIATION	FLOORS		VEST.	VEST.	VEST.		BASE'MT.	1ST FL.		
	TYPE OF HEATER		VENTO	VENTO	VENTO		VENTO	VENTO		
	LINEAL FT. OF TUBE	TEMP'G.								
		H'TING								
	SQ. FT. HEATING SURFACE	TEMP'G	194	445	365		1552	1339		
		H'TING	[illegible]	[illegible]	[illegible]		1507	2307		
	EQUIV. DIR. RAD.		916	2070	1710		25,200	27,600		57,496
TOTAL # RADIATION										76,195

SUPPLY FANS	FAN NO	1	2	3	5	6	7
	FUNCTION	BASE'MT. SUPPLY	1ST FL.	BOILER ROOM	VEST.	VEST.	VEST.
	CAPACITY C.F.M.	63400	55700	39800	3500	8400	7000
	S.P.	1¼	1¼	5/8	½	½	½
	R.P.M.	227	247	304	672	510	450
	MOTOR #	30	25	15	1½	3	2

EXHAUST FANS	FAN NO.	14	4	8	9	10	11	12	13	15	
	FUNCTION	1ST FL.	BOILER ROOM	TOILET	KITCHEN	← DINING	ROOM →			TOILET	[illegible]
	CAPACITY C.F.M.	46,000	22,400	13,500	8,300	← NO. 3 -	VENTURA →			20,000	No. 3 VENTURA
	S.P.	5/8	5/8	5/8	½	← F.	D. →			5/8	F.D.
	R.P.M.	220	342	347	416	← 1150 →				327	1150
	MOTOR #.	15	7½	5	2					7½	

AIR WASHERS	FUNCTION	BASEMENT SUPPLY	1ST FLOOR SUPPLY
	CAPACITY	63,400	55,700
	TYPE	CARRIER "A" SIZE 10E	CARRIER "AG"; SIZE-9E
	PUMP #.	4"-17" PRESS. 10 #.	4"-35" PRESS. 15 #.
AIR FILTERS	FUNCTION	NONE	NONE
	TYPE		
	SIZE OF UNITS		
	UNITS.		
THERMOSTATIC CONTROL			
REGISTERS ETC.	183 REGISTERS; 14 SCREENS.		

BOILER PLANT

BOILERS (WATER TUBE)	# RATING	FOUR (4) @ 300 IN TWO BATTERIES	
		TOTAL = 1200 # (ARRANGED TO BURN OIL)	
FURNACE	FOR BOILERS AT 200% RATING. 10 FT. SETTING		
STOKERS	NONE		
FORCED DRAFT	FANS	SIZE	NONE
AUTOMATIC CONTROL			
	NUMBER	SIZE	MOTOR #
BOILER FEED PUMP	2	2"	
VACUUM PUMPS	2	60 GAL. [illegible]	5
RECEIVER	1	20" DIA. x 60" L.	
BOILER FEED TANK	1	8'x6'x5'	
ASH REMOVAL	NONE		
COAL HANDLING EQUIPMENT	PROVISSION MADE FOR STORAGE		
FUEL OIL EQUIPMENT	3 STORAGE TANKS - 8' DIA. x 19'-1½" L.		
	2 - 2" PUMPS.		
	2 - VERTICAL 7 PASS STRAIGHT TUBE OIL HEATERS.		
INCINERATOR	7'-9" x 12'-0" x 7'-0" (ANSONIA)		
ECONOMIZER	NONE		
BREECHING & DAMPERS			
INSULATION			
SHREDDER & BALER	NONE		

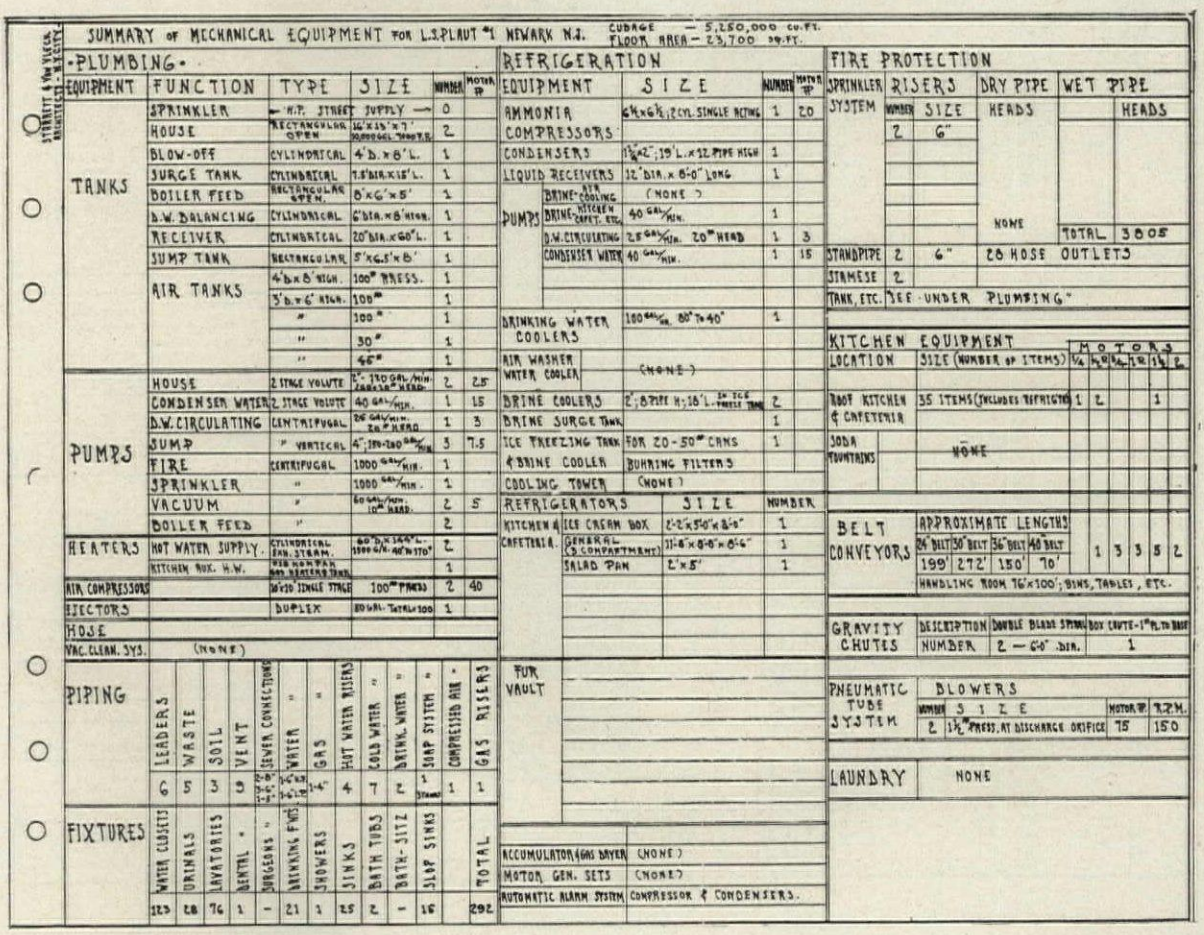
Summary Charts of Mechanical Equipment Are Useful Records

stead delivery stations located in the various delivery centers. With this system, the merchandise is loaded at the store in hampers, trunks, and, in some few instances, directly in rolls which are transferred to the delivery stations. With any of these route systems, additional elevators will be required to handle the packages. For the handling of furniture and pianos, where they are carried in the building, it is sometimes advisable to provide a van elevator, which will be large enough to bring a furniture van directly into the furniture department, where the furniture may be loaded directly into or out of the van. Whether this method is economical, considering the cost and amount of valuable floor space it occupies, is debatable.

Waste Handling. The problem of handling waste paper, boxes and rubbish is one which requires some thought. It is sometimes possible to sell this refuse, but often it costs more to prepare it for sale than the amount obtained. It is therefore quite possible that a waste incinerator or boiler may be considered as part of the store equipment. In many instances, it has been found that the hot water requirements, and sometimes sufficient steam, can be generated for the cafeteria kitchen from the refuse which would otherwise have to be carted away at expense to the store. To collect the paper and refuse, it is advisable to provide chutes running through the building, with hopper doors on each floor. In large buildings, it is advisable to provide separate chutes for paper and rubbish, carrying the refuse to separate sorting or accumulation rooms. Very often a shredding machine may be installed, and some of the paper may be shredded and recovered for packing purposes. The chutes and sorting rooms should be protected against fires, for these are among the places in a building where fires occur more frequently than anywhere else. For wooden crates a machine called a "hogger" is sometimes installed to break up boxes, and they are then fed directly to the incinerator.

Incinerators. It is important, in the selection of an incinerator, that all the facts as to quantity and type of rubbish to be burned, and what the waste is to be used for, be known, for without full information serious difficulties will follow.

Fur Storage. The handling and the storage of furs in the modern store building require considerable thought, for here is a value which must be protected not only against fire and theft, but



SUMMARY OF MECHANICAL EQUIPMENT FOR L. S. PLANT #1 NEWARK N.J. CUBAGE — 5,250,000 CU. FT. FLOOR AREA — 23,700 SQ. FT.

STARRETT & VAN VLECK, ARCHITECTS - BUILDERS

PLUMBING

EQUIPMENT	FUNCTION	TYPE	SIZE	NUMBER	MOTOR HP
TANKS	SPRINKLER	— N.P. STREET	SUPPLY —	0	
	HOUSE	RECTANGULAR OPEN	16'x25'x7' (CAPACITY 70,000 GAL. TOTAL)	2	
	BLOW-OFF	CYLINDRICAL	4'D. x 8'L.	1	
	SURGE TANK	CYLINDRICAL	7.5'DIA. x 15'L.	1	
	BOILER FEED	RECTANGULAR OPEN.	8'x6'x5'	1	
	D.W. BALANCING	CYLINDRICAL	6'DIA. x 8'HIGH.	1	
	RECEIVER	CYLINDRICAL	20"DIA. x 60"L.	1	
	SUMP TANK	RECTANGULAR	5'x6.5'x8'	1	
	AIR TANKS		4'D. x 8' HIGH. 100# PRESS.	1	
			3'D. x 6' HIGH. 100#	1	
			" 100 "	1	
			" 30"	1	
			" 45"	1	
PUMPS	HOUSE	2 STAGE VOLUTE	2" - 170 GAL/MIN. AGAINST 240' HEAD	2	25
	CONDENSER WATER	2 STAGE VOLUTE	40 GAL/MIN.	1	15
	D.W. CIRCULATING	CENTRIFUGAL	26 GAL/MIN. 20# PRESS. HEAD	1	3
	SUMP	" VERTICAL	4" - 150-250 GAL/MIN.	3	7.5
	FIRE	CENTRIFUGAL	1000 GAL/MIN.	1	
	SPRINKLER	"	1000 GAL/MIN.	1	
	VACUUM	"	60 GAL/MIN. 10# HEAD.	2	5
	BOILER FEED	"		2	
HEATERS	HOT WATER SUPPLY	CYLINDRICAL EXP. STEAM.	60"D. x 144"L. 1500 G.P.H. 40° TO 170°	2	
	KITCHEN HOT. H.W.	PIN HOT WATER AND MARLOWE TYPE		1	
AIR COMPRESSORS		W.P.20 SINGLE STAGE	100# PRESS	2	40
EJECTORS		DUPLEX	250 GAL. TOTAL 200	1	
HOSE					
VAC. CLEAN. SYS.	(NONE)				

PIPING	LEADERS	WASTE	SOIL	VENT	SEWER CONNECTIONS	WATER	GAS	HOT WATER RISERS	COLD WATER "	DRINK. WATER "	SOAP SYSTEM "	COMPRESSED AIR "	GAS RISERS
	6	5	3	3	12"-8" 10"-6" 8"-4" 6"-3"	1-4"	1-4"	4	7	2	1 STAND	1	1

FIXTURES	WATER CLOSETS	URINALS	LAVATORIES	DENTAL "	SURGEONS "	DRINKING FNTS.	SHOWERS	SINKS	BATH TUBS	BATH-SITZ	SLOP SINKS		TOTAL
	123	28	76	1	-	21	1	25	2	-	16		292

REFRIGERATION

EQUIPMENT		SIZE	NUMBER	MOTOR HP
AMMONIA COMPRESSORS		6¾"x6½", 2 CYL. SINGLE ACTING	1	20
CONDENSERS		1¾"x2", 19'L. x 12 PIPE HIGH	1	
LIQUID RECEIVERS		12'DIA. x 8'-0" LONG	1	
PUMPS	BRINE-AIR COOLING	(NONE)		
	BRINE-KITCHEN CONDT. ETC.	40 GAL/MIN.	1	
	D.W. CIRCULATING	28 GAL/MIN. 20# HEAD	1	3
	CONDENSER WATER	40 GAL/MIN.	1	15
DRINKING WATER COOLERS		180 GAL/HR. 80° TO 40°	1	
AIR WASHER WATER COOLER		(NONE)		
BRINE COOLERS		2"; 8 PIPE H; 18'L. 2# ICE FREEZE TANK	2	
BRINE SURGE TANK			1	
ICE FREEZING TANK & BRINE COOLER		FOR 20-50# CANS BUHRING FILTERS	1	
COOLING TOWER		(NONE)		

REFRIGERATORS		SIZE	NUMBER
KITCHEN & CAFETERIA	ICE CREAM BOX	2'-2"x5'-0"x2'-0"	1
	GENERAL (5 COMPARTMENT)	11'-6"x2'-6"x6'-6"	1
	SALAD PAN	2'x5'	1

FUR VAULT

ACCUMULATOR (GAS DRYER)	(NONE)
MOTOR GEN. SETS	(NONE)
AUTOMATIC ALARM SYSTEM	COMPRESSOR & CONDENSERS.

FIRE PROTECTION

SPRINKLER SYSTEM	RISERS NUMBER	RISERS SIZE	DRY PIPE HEADS	WET PIPE	WET PIPE HEADS
	2	6"			
			NONE	TOTAL	3005
STANDPIPE	2	6"	28 HOSE OUTLETS		
SIAMESE	2				
TANK, ETC.	SEE UNDER PLUMBING"				

KITCHEN EQUIPMENT LOCATION	SIZE (NUMBER OF ITEMS)	MOTORS ¼	½	¾	1	1½	2
ROOF KITCHEN & CAFETERIA	35 ITEMS (INCLUDES REFRIGTR)	1	2			1	
SODA FOUNTAINS	NONE						

BELT CONVEYORS	APPROXIMATE LENGTHS 24" BELT	30" BELT	36" BELT	48" BELT					
	199'	272'	150'	70'	1	3	3	5	2
	HANDLING ROOM 76'x100'; BINS, TABLES, ETC.								

GRAVITY CHUTES	DESCRIPTION	DOUBLE BLADE STRAW	BOX CHUTE-1st FL. TO BASE
	NUMBER	2 — 6'-0" DIA.	1

PNEUMATIC TUBE SYSTEM	BLOWERS NUMBER	SIZE	MOTOR HP	R.P.M.
	2	1½" PRESS. AT DISCHARGE ORIFICE	75	150

LAUNDRY	NONE

This Continues the Summary for the Kresge Department Store, Newark

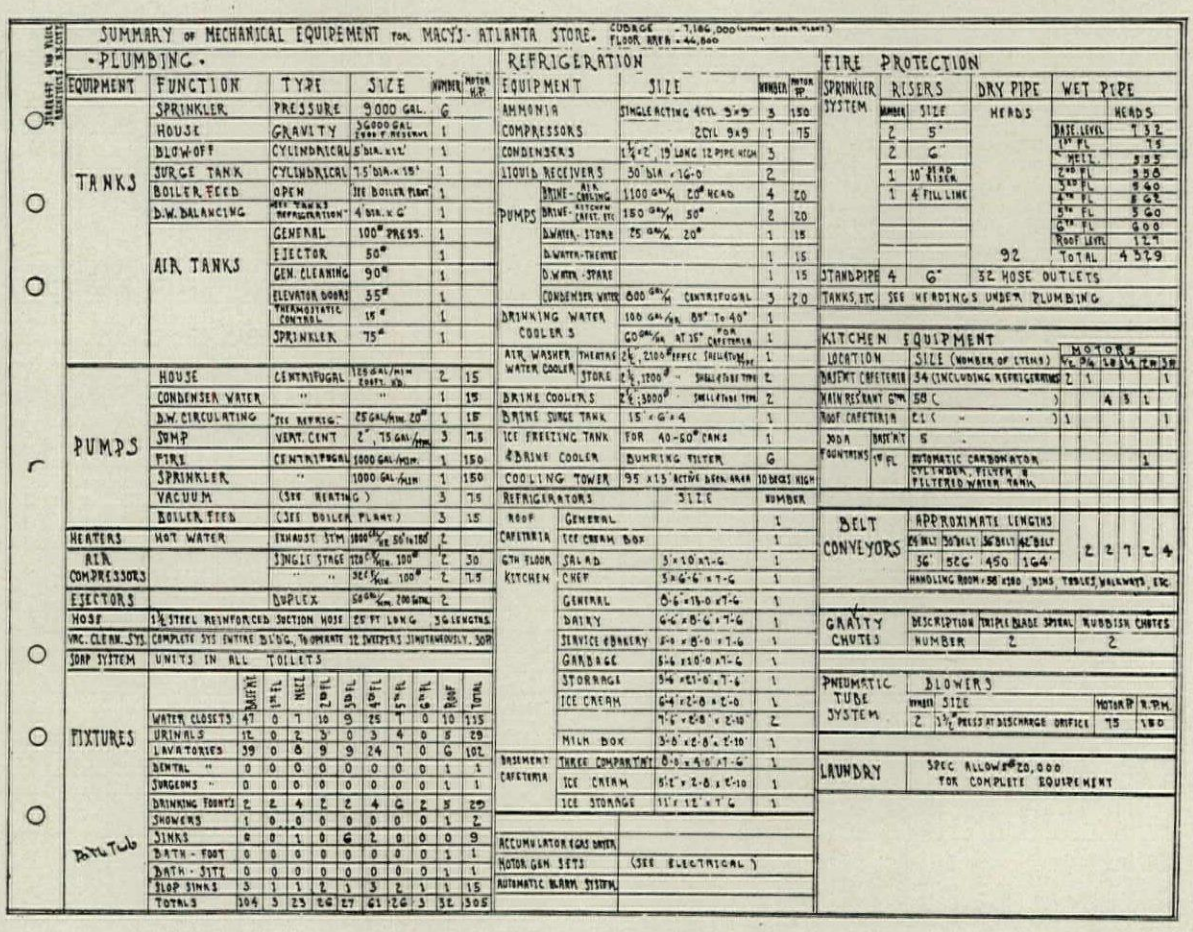
from moths. There are two systems used in the storage of furs; in one, the furs are thoroughly cleaned and placed in a refrigerated vault; in the other, they are first put into a gas chamber where they are fumigated, and then placed in vaults which are periodically treated with the same fumigating gas. There is considerable difference of opinion as to the merits or advantages of this gas system over those of the refrigerated system.

MAINTENANCE AND UPKEEP

In the large store building, with all its vast amount of equipment, there comes the problem of maintenance and upkeep. Very often the tendency in the design of the building is to minimize the importance of allowing sufficient space for the accessibility to pipes, shafts, and so forth, which results in extremely difficult and costly maintenance. Too much stress cannot be put upon the importance of having large pipe shafts, with the piping so arranged as to be readily accessible. Nor must the accessibility of machinery or equipment be overlooked. Considering the cost of replacing the machinery which cannot be properly maintained due to crowded conditions, it is necessary to consider not only the bare cost but also the inconvenience due to a shut down.

Quality of Materials. In the selection of materials to be used in a store building, it is essential that care be exercised, for it is not merely first cost or replacement cost, but how seriously the replacement will interfere with the operation of the store, that matters. Nothing that is done must interfere with the selling organization. For example, failure of the elevators or the plumbing system during an anniversary week sale would be a catastrophe. Often the engineer is criticized because he wants to use brass water pipes or even return heating pipes. Nevertheless, he has probably been through the mill and is undoubtedly profiting by experience, in spite of the fact that the architect would perhaps rather spend the money involved for more marble in the vestibule or for more extensive decoration.

Considering the fact that the store building is a capital investment to be carried for a term of years, the character of materials should be such that it will require the least maintenance and replacement cost. In the layout and selection of equipment, it is always wise to consider how



SUMMARY OF MECHANICAL EQUIPEMENT FOR MACY'S - ATLANTA STORE. CUBAGE = 7,186,000 (without boiler plant) FLOOR AREA = 46,800

• PLUMBING •

EQUIPMENT	FUNCTION	TYPE	SIZE	NUMBER	MOTOR H.P.
TANKS	SPRINKLER	PRESSURE	9000 GAL.	6	
	HOUSE	GRAVITY	36000 GAL (EQUIP. F. RESERVE)	1	
	BLOW-OFF	CYLINDRICAL	5'DIA. x 11'	1	
	SURGE TANK	CYLINDRICAL	7.5'DIA. x 15'	1	
	BOILER FEED	OPEN	(SEE BOILER PLANT)	1	
	D.W. BALANCING	HOT TANKS REFRIGERATION	4' DIA. x 6'	1	
AIR TANKS		GENERAL	100# PRESS.	1	
		EJECTOR	50#	1	
		GEN. CLEANING	90#	1	
		ELEVATOR DOORS	55#	1	
		THERMOSTATIC CONTROL	15#	1	
		SPRINKLER	75#	1	
PUMPS	HOUSE	CENTRIFUGAL	125 GAL/MIN = 60 FT. HD.	2	15
	CONDENSER WATER	"	"	1	15
	D.W. CIRCULATING	(SEE REFRIG.)	25 GAL/MIN. 20#	1	15
	SUMP	VERT. CENT	2", 75 GAL/MIN	3	7.5
	FIRE	CENTRIFUGAL	1000 GAL/MIN.	1	150
	SPRINKLER	"	1000 GAL/MIN	1	150
	VACUUM	(SEE HEATING)		3	7.5
	BOILER FEED	(SEE BOILER PLANT)		3	15
HEATERS	HOT WATER	EXHAUST STM	1000 SQ. FT. RAD. 50 IN 180	2	
AIR COMPRESSORS		SINGLE STAGE	170 CU. FT./MIN. 100#	2	30
		" "	35 CU. FT./MIN. 100#	2	7.5
EJECTORS		DUPLEX	50 GAL/MIN. 200 GAL.	2	
HOSE		1½" STEEL REINFORCED SUCTION HOSE	25 FT LONG	36 LENGTHS	
VAC. CLEAN. SYS		COMPLETE SYS ENTIRE BLDG, TO OPERATE 12 SWEEPERS SIMULTANEOUSLY. 30 HP			
SOAP SYSTEM		UNITS IN ALL TOILETS			

FIXTURES	BASEMENT	1ST FL.	MEZZ.	2ND FL.	3RD FL.	4TH FL.	5TH FL.	6TH FL.	ROOF	TOTAL
WATER CLOSETS	47	0	7	10	9	25	7	0	10	115
URINALS	12	0	2	3	0	3	4	0	5	29
LAVATORIES	39	0	8	9	9	24	7	0	6	102
DENTAL "	0	0	0	0	0	0	0	0	1	1
SURGEONS "	0	0	0	0	0	0	0	0	1	1
DRINKING FOUNTS	2	2	4	2	2	4	6	2	5	29
SHOWERS	1	0	0	0	0	0	0	0	1	2
SINKS	2	0	1	0	6	2	0	0	0	9
BATH - FOOT	0	0	0	0	0	0	0	0	1	1
BATH - SITZ	0	0	0	0	0	0	0	0	1	1
SLOP SINKS	3	1	1	2	1	3	2	1	1	15
TOTALS	104	3	23	26	27	61	26	3	32	305

Bath Tub

REFRIGERATION

EQUIPMENT		SIZE	NUMBER	MOTOR HP
AMMONIA		SINGLE ACTING 4 CYL 5"-5"	3	150
COMPRESSORS		2 CYL 9x9	1	75
CONDENSERS		1¼"x2", 19' LONG 12 PIPE HIGH	3	
LIQUID RECEIVERS		30" DIA. x 16'-0	2	
PUMPS	BRINE - AIR COOLING	1100 GAL/MIN 20# HEAD	4	20
	BRINE - KITCHEN CAFET. ETC	150 GAL/MIN 50#	2	20
	D.WATER - STORE	25 GAL/MIN 20#	1	15
	D.WATER - THEATRE		1	15
	D.WATER - SPARE		1	15
	CONDENSER WATER	600 GAL/MIN CENTRIFUGAL	3	20
DRINKING WATER COOLERS		100 GAL/HR 88° TO 40°	1	
		60 GAL/HR AT 35° FOR CAFETERIA	1	
AIR WASHER WATER COOLER	THEATRE	2½", 2100# EFFEC. INSULATION TYPE	1	
	STORE	2½", 1200# " SHELL & TUBE TYPE	2	
BRINE COOLERS		2½", 3000# " " "	2	
BRINE SURGE TANK		15' x 6' x 4	1	
ICE FREEZING TANK & BRINE COOLER		FOR 40-50# CANS BUNKING FILTER	1	6
COOLING TOWER		95 x 15' ACTIVE AREA	10 MOD. HIGH	

REFRIGERATORS		SIZE	NUMBER
ROOF	GENERAL		1
CAFETERIA	ICE CREAM BOX		1
6TH FLOOR KITCHEN	SALAD	5'-0 x 10'-0 x 7'-6	1
	CHEF	5'-0 x 6'-6" x 7'-6	1
	GENERAL	6'-6 x 15'-0 x 7'-6	1
	DAIRY	6'-6 x 8'-6" x 7'-6	1
	SERVICE & BAKERY	8'-0 x 8'-0 x 7'-6	1
	GARBAGE	5'-6 x 10'-0 x 7'-6	1
	STORRAGE	5'-6 x 21'-0" x 7'-6	1
	ICE CREAM	6'-6" x 21'-0 x 2'-0	1
		7'-6 x 2'-8" x 2'-10	2
	MILK BOX	5'-0" x 2'-8" x 2'-10	1
BASEMENT CAFETERIA	THREE COMPARTMT	8'-0 x 4'-0" x 7'-6	1
	ICE CREAM	5'-2" x 2'-8 x 2'-10	1
	ICE STORAGE	11'-6 x 12' x 7'-6	1

ACCUMULATOR (GAS DRIVE)	
MOTOR GEN SETS	(SEE ELECTRICAL)
AUTOMATIC ALARM SYSTEM	

FIRE PROTECTION

SPRINKLER SYSTEM	RISERS NUMBER	RISERS SIZE	DRY PIPE HEADS	WET PIPE HEADS	
	2	5"		BASE. LEVEL	732
	2	6"		1ST FL	75
				MEZZ.	535
	1	10" HEAD RISER		2ND FL	550
	1	4" FILL LINE		3RD FL	540
				4TH FL	562
				5TH FL	560
				6TH FL	600
				ROOF LEVEL	129
			92	TOTAL	4329

STANDPIPE	4	6" 32 HOSE OUTLETS
TANKS, ETC.		SEE HEADINGS UNDER PLUMBING

KITCHEN EQUIPMENT

LOCATION	SIZE (NUMBER OF UTENS.)	MOTORS ¼ HP	½ HP	1 HP	1½ HP	3 HP
BASEMENT CAFETERIA	34 (INCLUDING REFRIGERATING)	2	1			1
MAIN RESTAURANT 6TH FL	58 ( )			4	3	1
ROOF CAFETERIA	21 (")	1				1
SODA FOUNTAINS BASEMENT	5 "					
1ST FL	AUTOMATIC CARBONATOR				1	
	CYLINDER, FILTER & FILTERED WATER TANK					

BELT CONVEYORS

APPROXIMATE LENGTHS	24 BELT	30 BELT	36 BELT	42 BELT					
36'	526'	450	164'	2	2	7	2	4
HANDLING ROOM, SERVING, DISHS, TABLES, WALKWAYS, ETC.									

GRAVITY CHUTES

DESCRIPTION	TRIPLE BLADE SPIRAL	RUBBISH CHUTES
NUMBER	2	2

PNEUMATIC TUBE SYSTEM

BLOWERS NUMBER	SIZE	MOTOR H.P.	R.P.M.
2	13½" PRESS AT DISCHARGE ORIFICE	75	1180

LAUNDRY — SPEC ALLOWS $20,000 FOR COMPLETE EQUIPEMENT

The Mechanical Equipment of the Davison-Paxon Co. Store, Atlanta, is Summarized on this Chart, in that Opposite, and the Chart on Page 932

simple it can be made, rather than how complicated. There seems to be a tendency to make equipment complicated, and by so doing give the impression that it must be good, whereas the more simple layout will probably cost considerably less and will certainly function as well. It will also relieve the operating department of the cost of keeping one more especially trained man to look out for it. The days of making engineering mistakes with impunity are gone forever. Equipment that is top-notch today may be obsolete tomorrow. There are no dark secrets, and practically all equipment can be seen or, if not, manufacturers are able to produce enough data to substantiate their claims for it. It is best to avoid, as far as possible, using something entirely new and original, particularly where it will affect the operation of the building. A store is no place for making experiments; only tried equipment must be used. This may seem to be contradicting a statement previously made, but it does not, for while some equipment may not have been applied to store work, it may have been developed for other uses, and it can be readily adapted. There is a tendency among some operating engineers not to put labor-saving equipment into a building, just as they at one time balked at buying public service current,—for fear of "losing their jobs." Thought must be given to this phase of the scheme of things, for anything to

Main Floor, Davison-Paxon Co. Building, Atlanta

SUMMARY of MECHANICAL EQUIPMENT for MACY'S-ATLANTA STORE — Cubage —, Floor Area —

HEATING & VENTILATING

DIRECT RADIATION	FLOOR	BASEMENT	1ST.	MEZZ.	2	3	4	5	6	MAIN ROOF	PENT'H.	TOTALS		
	RADIATORS	15	8	9	33	34	35	36	38	36	5	247		
	#	1140	343	660	3388½	3431	3205	3361	3269	1963½	290	21,071		
INDIRECT RADIATION	FLOORS		E.VEST.	E.VEST.	S.VEST.	N.VEST.	AUDIT'M	BASEMT	1ST FL.					
	TYPE OF HEATER		AEROFIN	AEROFIN	AEROFIN	AEROFIN	AEROFIN	VENTO	VENTO					
	LINEAL FT. OF TUBE	TEMP'G	—	—	—	—	1400							
		HTING	420	420	280	280	1400							
	SQ. FT. HEATING SURFACE	TEMP'G	—	—	—	—	—	2432	2736					
		HTING	—	—	—	—	—	3648	4104					
	EQUIV. DIR. RAD.		2360	2360	1580	1580		30000	38000			75880		
TOTAL # RADIATION.												96,951		

SUPPLY FANS	FAN Nº	1	2	3	4	5	6	7	14					
	FUNCTION	1ST FL.	BASE'T SUPPLY	E. VEST'BE	E. VEST'LE	S. VEST'LE	N. VEST'LE	BOILER ROOM	AUDI-TORIUM					
	CAPACITY C.F.M.	93,000	84,000	4700	4700	6600	6600	37800	23,000					
	S.P.	1½	1½	⅝	⅝	⅝	⅝	¾	1¼					
	R.P.M.	251	275	504	504	476	476	643	594					
	MOTOR HP.	50	40	2	2	1.5	1.5	12.5	10					
EXHAUST FANS	FAN Nº	8	9	10	11	12	13	15	16	17	18	19	20	
	FUNCTION	1ST FL.	TOILETS LOCKERS M. BASE'T	TOILETS	TUBE ROOM	BASE'T KITCHEN	G'D FL. KITCHEN	AUDI-TORIUM	MAIN KY. BNG. RM.	MAIN KY. BNG. RM.	MAIN KY. BIN. RM.	MAIN KY. BNG. RM.	PROJECT TOL. STR.	
	CAPACITY C.F.M.	35000	46,000	29000	5000	9900	29000	17,700	3500	3500	3500	3500	180	
	S.P.	⅝	⅝	⅝	½	⅝	½	¼	F.D.	F.D.	F.D.	F.D.	A	
	R.P.M.	226	218	249	509	406	236	267	338	338	336	338	1140	
	MOTOR HP.	10	15	10	1.5	3	7.5	5	½	¼	¼	¼	⅙	

AIR WASHERS	FUCTION	AUDITORIUM AIR	FIRST FLOOR AIR	BASEMENT AIR
	CAPACITY	24,100 C.F.M.	93,000	84,000
	TYPE	CARRIER "A" - Nº 5D	SPECIAL SIZE	SPECIAL SIZE
	PUMP HP	7.5	30	20
AIR FILTERS	FUNCTION	BASEMENT SUPPLY	FIRST FLOOR SUPPLY	
	TYPE	REED	REED	
	SIZE OF UNITS	20"×20"×4"	20"×20"×4"	
	UNITS	10 WIDE × 9 HIGH = 90	11 WIDE × 9 HIGH = 99	
THERMOSTATIC CONTROL				

BOILER PLANT

BOILERS (WATER TUBE) DESV.	RATING	ONE (1) AT 400		
		ONE (1) AT 200		
FURNACE	FOR BOILERS AT 200% RATING			
STOKERS	AUTOMATIC STOKERS MOTOR DRIVEN			
FORCED DRAFT	FANS	SIZE	400 HP BOILER AT 200% RATING	20 HP MOTOR
			200 HP " " " "	15 HP "
			AIR SUPPLY FROM BOILER ROOM	
			SUPPLY DUCT TO BOILERS IN CONCRETE TRENCH	
AUTOMATIC CONTROL	REGULATES	FANS, STOKERS & DAMPERS		
	RANGE	35% to 200%, LOADING		

	NUMBER	SIZE	MOTOR HP
BOILER FEED PUMP	3	100 GAL 100#	15
VACUUM PUMPS	3	FAIR "E"	7.5
RECEIVER	1	2'6"×6'0"	
BOILER FEED TANK	1	6'×6'×6'	

ASH REMOVAL	ONE (1) EXHAUSTER SET	25 HP MOTOR
	AIR PIPING (12") CONNECTS DUST COLLECTOR & BREECHING	
	ONE (1) DUST COLLECTOR	
	ONE (1) STORAGE TANK - 600 CU FT	
	6" FLANGED CONVEYOR DUCT	
COAL HANDLING EQUIPMENT	ONE (1) AIR TIGHT GRAVITY FEED COAL BUNKER 16×12×12	
	6" FLANGED SUCTION PIPING BETWEEN STORAGE & FEED BUNKERS	
	SWIVELLED SUPPLY PIPE TO STOKER HOPPERS.	
INCINERATOR	8'-0"×19'-0"×9'-0"	
ECONOMIZER	2000 GAL/HR 53° TO 193°	
BREECHING & DAMPERS		
INSULATION	ALL NECESSARY INSU. INCLUDING BOILER N.W. CEILING.	
SHREDDER & BAKER	10 HP MOTOR	

Continuation of the Summary Chart of the Mechanical Equipment of the Davison-Paxon Co. Department Store, Atlanta

reduce labor cost must be considered. With the development of the central station, with its turbines producing electricity at the rate of 1 kw. for 1½ pounds of steam, there is little likelihood of any engineer's advising the installation of a private generating plant with all its complications, worries and accompanying disadvantages, to say nothing of the incidental costs and relative value of the space it would occupy if converted into selling area,—for after all, the merchant is selling,—not manufacturing.

Boiler Plant. By the same token, the question of using a boiler plant as against use of central heat, if such heat is available, should be carefully weighed, and where continuity of service is obtainable at suitable working pressures, it is of course to the advantage of the merchant to use the service of the central plant,—again saving space and avoiding the annoyance of handling coal and ashes. The question as to the type of boiler plant used depends on the size of the building and the uses of the steam. Generally, the average store building is of such size as to require boilers of the water-tube type. Though they are a little more expensive than some of the other types, they are more efficient, safer, more economical, and, with reasonable care, have a long life span. The type of fuel used, whether hard or soft coal, or oil, depends on the location of the building and the cost of the fuel. Of the three types of fuel, the oil is probably the cleanest if the burning equipment is properly selected and installed. With oil, the dust from handling the in-coming coal or the out-going ashes is entirely eliminated. The operating cost with oil may be about the same as with soft coal with high grade stoker equipment; for a rough comparison, oil at 4½ cents a gallon is equivalent, in cost, to coal at $5.50 a ton. The uninitiated should be careful about selecting oil-burning or stoker equipment, for there are many pitfalls.

SUMMARY OF MECHANICAL EQUIPMENT FOR MACY'S - ATLANTA STORE

ELECTRICAL

ELEVATORS	DUTY	NUMBER	TYPE: SW'S	TYPE: AMPERES	TYPE: GEARED	TYPE: GEARLESS	TYPE: HORIZONTAL SLIDING DOORS	TYPE: AUTOMATIC CONTROL	TYPE: PUSH BUTTON OPERATING	CAPACITY	SPEED	MOTOR HP	CURRENT	FLOORS SERVED
	PASSENGER	8	D.W.T.	2:1	—	"	"	—	—	3500#	450'	50	A.C.	
	"	1	D.W.T.	1:1	GEARED	—	—	RELIEF	—	2250	250'	20	A.C.	
	FREIGHT	1	D.W.T.	2:1	—	ARMATURE VOLT.	—	—	—	4000	400'	50	A.C.	
	"	2	D.W.T.	2:1	—	"	"	—	—	2000	450'	25	"	
	SERVICE	2	D.W.T.	2:1	—	"	"	—	—	3500	450'	50	"	
	DUMBWAITER	1								300	50'		A.C.	

MOTOR GENERATOR SETS	DUTY	BATTERY CHARGING			TEL. ROOM	5TH FL.		TEXTILE SHIPMENT			ELEVATORS								
	K.W. RATING	5			2			25			"SEE DIFFERENT HEADING"								
	NUMBER	1			1			2			"								
ELECTRIC SERVICE		FLOOR AREA	BASEMENT	1ST FL.	2ND FL.	3RD FL.	4TH FL.	5TH FL.	6TH FL.	7TH FL.	8TH FL.	ROOF	PENTHOUSE	TOTAL
			7000	5000	61000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	22,000		
	LIGHT	WATTS PER ♦														
		TOTAL RM. CIR.		36	330	226	26	221	208	178	192	193			36	1458
		3 WAY CIRCUITING			1780	2340	480	2440	2340	2260	2360	2200				16,180 ft
		3 WAY CIRCUITING														
		BORDER LIGHTS				26	51	11	33	34	33	34	34			266
		CONDUIT BASE														
	FAN						48		23	23	23	23	23			163
FIXTURES	CEILING			20	33	231	61	130	105	106	124	156	147	86	15	1188
	BRACKET			2	15	15	57	9	7	11	10	11	8	13	2	160
	BASE RECEPTACLE			12	18	1	48							20	5	96
	EXIT					4	4	—	4	4	4	6	4	2		32
	EXTENSION (LIGHT)				6	14	57	14	4	15	8	2	12	1		131
	TOTALS															1607
FIRE ALARM	KYS.	STATIONS	2	1	8	4	2	4	4	4	4	5	2			40
		GONGS	1	1	8	4	2	4	4	4	4	5	2			39
WATCHMAN	KYS.	STATIONS			6	4	2	4	4	4	4	4	2			34
CLOCKS	KYS.	STATIONS	1	1	1	2	5	1	1	1	1	1	4			19
DISMISSAL BELLS		STATIONS			4	2	2	4	4	4	4	4				28
TELEPHONES	PUBLIC : PRIVATE : TOTAL :															
EXECUTIVE CALL	VISIBLE : AUDIBLE : TOTAL :															
LOW TENSION																
TRANSFORMERS	3 - 3Φ - 60 CYCLE - 1000 K.W.															

Electrical and Other Equipment, Davison-Paxon Co.

LIGHTING AND ELECTRICAL WORK

There is no detail in connection with the modern store more important than lighting, which cannot be given too much careful consideration and study. The quality of the lighting has a tremendous bearing on the buying public; it has a certain amount of drawing power, just as a poorly lighted place is repulsive. People will shop in the store where the surroundings are most pleasant, cheerful and inviting. Good lighting does not necessarily involve use of the most extravagant fixtures, for lighting that properly displays the merchandise is not glaring or tiring to the customer, and it is one of the store's best salesmen. It is extremely important to so place the outlets as to distribute the light evenly without glare or excessive brilliance of the lighting units, for there is nothing that will cause more fatigue or injury to the eye, and, in fact, to the entire nervous system, than glare. Often we hear women complain of how tiring it is to shop in certain stores. This complaint can be traced to one of two things,—poor ventilation or lighting. If it is fatiguing to the customer, how must it affect the clerk, who is in the store day after day?

It is not necessary to have extremely high intensities of light to display merchandise, but it is just as harmful to have too little. There are advocates of high intensities of light. In fact, during the past ten years, the recommendations for proper lighting have jumped from about 4 candles per square foot to between 15 and 20. These latter figures are, in my personal opinion, usually excessive and unnecessary, for with the proper spacing of the outlets, and with well designed fixtures, an evenly distributed light can be produced,—a light which will flood the entire space. The effectiveness of general lighting depends, to a greater or lesser degree, on the reflecting properties of the walls, ceilings and floors, as well as on the colors of the fixtures and the general dimensions of the spaces to be lighted. It is well to avoid use of highly polished or glossy finished surfaces, such as the tops of counters, show cases, etc., for these surfaces only cause reflective or specular glare, which is very injurious to the eye. This can be avoided by using mat or

stippled finishes, by shifting the light source, by reducing its brilliance, or by using an indirect lighting unit. Although there are many instances where artificial light of the color approaching daylight might be desirable, habit seems to demand artificial light of a warmer hue. The color of light plays an important part if the source is concealed, for the surrounding colors are made more effective. Where attempts have been made to produce a light resembling daylight in stores, there were so many surrounding influences, such as the color of carpets, furniture, merchandise, and wall and ceiling tints, that the results were negative. Although very extravagant in current consumption, it is believed most practical, where light approaching daylight is desired, for matching colors, etc., that the local specially designed counter unit be employed.

Lighting Fixtures. In the selection of lighting fitments it is wise to avoid the spectacular, for after all, the store is mainly for the sale of merchandise, and not for the exhibition of lighting fixtures. Perhaps the ideal light for a store building is the light from totally different indirect lighting units, which use the ceiling as a medium of reflection and give a diffused light which floods the entire area. For selling certain types of merchandise, such as linens, no better type of light can be used. The objections raised in regard to this type of fixture are usually based on its appearance and on the fact that it uses more current than the usual semi-indirect bowl. It is quite probable that during this year there will be on the market a fixture which will give all the benefits of the indirect, and at the same time be sufficiently luminous, by using horizontal or vertical louvers, to take away the objections to the indirect. The semi-indirect bowl is familiar to all, and this leaves little to say about it except that it should be large enough to properly diffuse the light and to properly distribute it. The lighting units should be suspended and should be outside of the ordinary range of vision. Special fixtures are often required for such departments as the glass and china departments, silver, jewelry, furniture, etc. Often there will be special display rooms where the lighting must be more of the theatrical type, with spotlights for special effect.

Show Window Lighting. The show window is the silent salesman and must be lighted in such a way as to be dignified and still contain enough of the theatrical to attract the widest possible attention. The exact quantity of light needed will depend very largely on the surrounding conditions, for both day and night use. Naturally, on streets which are brilliantly lighted, the windows, to be attractive, must be more brilliant. However, although a great deal of light is required, it should generally be evenly distributed and not spotty. Usually, reflector lights are provided both at the top and the bottom, near the glass, and these are supplemented by spotlight outlets at either side. All lights in show windows should be arranged so that color screens can be used. It is desirable, although not absolutely necessary, to provide diffusing glass in front of all the border lights. For the best effects it is desirable to keep the top lights well above the top of the window, so that the light source is concealed from public view. The control of the lights should be such that any degree or quality of light may be obtained, as well as any color effect. This is generally accomplished by the use of multiple circuits. Particular care should be exercised in the finish of the backs of show windows. They should not be highly polished, but should have a mat or diffusing surface, which is also more attractive.

In some few instances skylights have been provided over the entire window and the lighting placed behind the skylight, but it is questionable whether the results justify the additional expenditures. For special display it is desirable to obtain as much light as possible, and it is possible, for this purpose, to use efficiently a single flood or spotlight. There are many departments in a store building that will require special lighting,—such places as the workrooms, the delivery department, the tube room, the machinery room, the restaurant, kitchen, beauty parlor, etc., all need special treatment.

General Wiring. In arranging the wiring for general lighting, it is well to have control centers at convenient locations, accessible from the general selling areas, and so that the person operating can see the lights he wishes to turn on or off. The preferred location is adjacent to the stairways. Generally, each light should be individually controlled. In arranging general distribution or feeders it is well to separate the general lighting,—the night lights, case lights and emergency lights,—on separate feeders controlled from the main switchboard. It is very important that there be continuity of service of electric supply, for an interruption in the supply of electric current will not only encourage theft, but may result in serious panic. With the ever-increasing demands on electrical service in the department store, it is well to allow at least 25 per cent reserve throughout all the distributing system.

Besides the general lighting, there are case and display fixture lighting to consider. A great many of the more recent buildings, instead of trying to take care of this work from the ordinary lighting currents, have special rectangular wiring ducts run in the floor, to which the cases

are attached. The use of these ducts makes it very practical to move and re-locate the cases without having to cut up the floor for new current connections. There are also numerous power requirements,—for in addition to the regular pumps, elevators, ventilating fans, etc., that are in every building, there are the workroom requirements. It is not uncommon, in a modern store, to have about 500 motors of various sizes, from ⅛ to 350 h.p.

Other Electrical Work. The executive call systems must be considered. These may be of the audible or gong type, or they may be of the silent type, where the executive's number is flashed when he is wanted. There is considerable debate as to which type is the more desirable. However, in some of the most recent buildings, the noise of the audible call was considered objectionable, and the visible type was installed. Then there is the usher's or aisle man's call from each of the several counters or departments. Unfortunately, up to the present time, no call that is entirely satisfactory has been devised. Some calls have numerous light outlets on columns; others use localized lights on the tops of display fixtures; others make use of annunciators; but all are open to some objection.

In addition to these systems, there are the fire alarm, sprinkler supervising alarm, the watchman's signal, clock systems, to say nothing of the network of telephone conduits, for there must be telephones in every department, both executive and selling, throughout the building. The fire alarm and watchman and sprinkler supervisory alarms are so closely governed by city and underwriters' requirements and regulations, that it seems best, except in unusual cases, to lease these systems from established, acceptable companies. With the almost universal adoption of alternating current for use of electrical energy, and with the advent of the telegraph clock, the solution of the clock problem, which has been more or less difficult due to the complications of its batteries, motor clocks, etc., is made easy.

Cash and Credit Handling. For the dispatch of credit and cash transactions, there are two general methods employed,—one using local cash registers and a telephone for authorization for charge accounts; and the other using pneumatic tubes. The telephone and register system is extensively used and is particularly adapted to stores where there is a preponderance of cash transactions. The system requires the installation of special telephones at the various departments and counters, and these terminate in a special control board in the credit department. The telephone has an auxiliary attachment which stamps the charge ticket, which is operated from the central desk, after the clerk has telephoned up for an O. K. The objection to this system is that it discloses to the public the customer's name and the object of the call, which sometimes causes considerable annoyance.

SPECIAL EQUIPMENT

Among the items which might be classed as special equipment would be those of beauty parlors; soda fountains; cafeterias; restaurants; kitchens; hospital rooms; laundries. The vogue of the beauty parlor has grown to such an extent that it not only requires special plumbing and electrical work, but special ventilation and air conditioning. In some of the modern beauty parlors, there are, in addition to the usual hair dressing, cutting, waving and manicuring compartments, special treatment rooms with their heat treatment, shower and rest rooms.

The soda fountain has developed from the "soda bar," where it was possible to get a soda or a plate of ice cream, to a miniature lunch room where all sorts of sandwiches, salads and pastry are served in addition to broth, soda, tea and coffee. This is generally located in a very prominent part of the store, either on the first floor or in the basement, and it requires very careful ventilation, for there is nothing that will permeate an area more quickly than the odor of coffee.

Besides providing the usual cafeteria for the employes, adjacent to the recreation center on one of the upper floors of the building, there are being installed cafeteria or buffet luncheonettes in basements, some of which serve as many as 3,000 persons during the luncheon period. This naturally requires special equipment and considerable service to handle such a volume of business. The store restaurant is a feature which has to be considered individually.

Every modern store is equipped with a physician's examination room, an emergency room, and rest rooms for both female and male employes. Some even expand this, and have rooms for eye specialists, chiropodists and dentists who take special care of employes. The equipment for these rooms is generally very simple, consisting of a bathroom, emergency toilet rooms and lavatories in each of the special rooms, together with the necessary electrical equipment for the examination and treatment of patients. Very often a small laundry is installed to handle the various uniforms and goods which have become soiled from handling. A laundry of this sort is quite simple; it requires only a few employes to operate it, and it is economical.

STORE FIXTURES AND INTERIOR EQUIPMENT

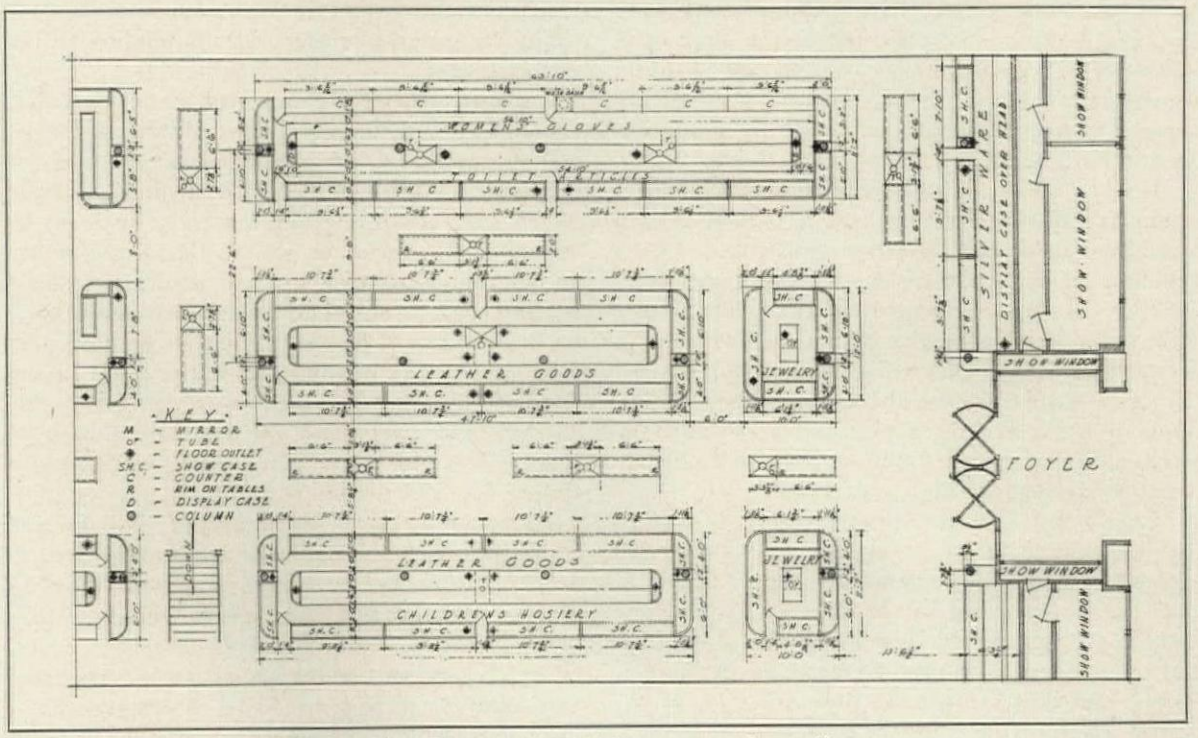
BY

GEORGE F. AND LOUIS A. AXT

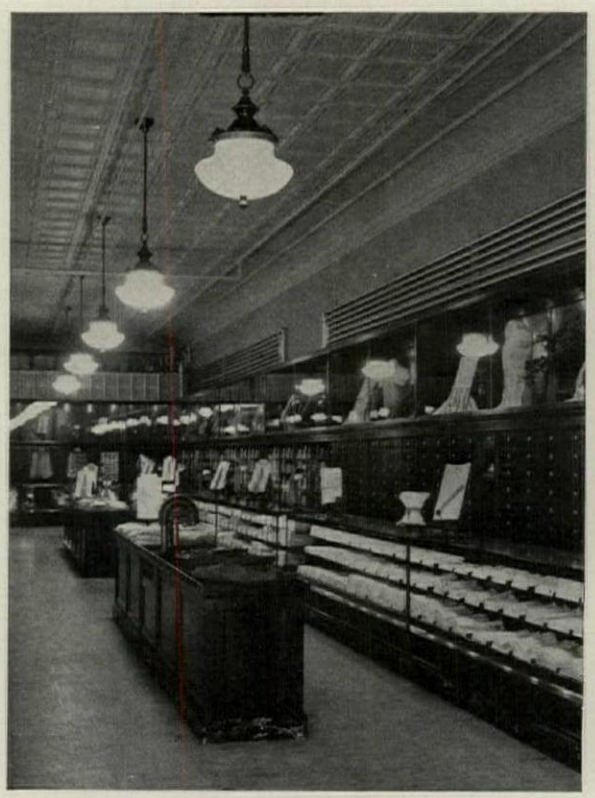
THE requirements of the modern department store have become so varied and exacting that the design, arrangement and construction of the store fixtures and interior equipment are almost invariably handled by a specialist, called, quite correctly, the "fixture architect and designer." This branch of work requires a combination of artistic and technical training, a grasp of the architects' and engineers' problems, and an understanding of department store organization in regard to merchandising, delivery, and the handling of stock and personnel. The fixture problems vary, as the store may be a department store, a dry goods, specialty, or jewelry store, or a store selling furs, shoes, etc. In the larger stores with restaurants, luncheonettes, and beauty parlors, etc., the mechanical requirements demand the closest coöperation between the "fixture architect" and the architect of the building. This coöperation should, and usually does, begin in the preliminary stages of the planning of the store.

Planning. Since the entire department store building project is centered around one primary object,—that of selling merchandise,—the instruments of such selling are the determining factors in every phase of planning and construction. The entire floor space is designed to accommodate, in the most efficient manner, the counters, show cases, and other fixtures, and all the mechanical equipment is designed with the store fixtures in mind. Even the structural frame of the building is planned primarily in its relation to fixture arrangement, and the column spacing itself is determined by the sizes and arrangement of the store fixtures and the aisles between.

The usual procedure in planning an efficient department store is, first, to have the architect of the building work out with the client the general arrangement of the entrances, the probable locations of the elevators, stairways and escalators, and the probable depth of the show windows. The central selling area is for the time being left blank, without even an indication of locations of the columns. The fixture architect, in consultation with the client and the architect, then makes a layout of the fixtures to show the various counters, show cases, center fixtures, aisle tables and wall fixtures. When this fixture arrangement has been approved by the owner from a merchandising point of view,—and not until then,—are the structural columns spotted on the plans. Naturally, adjustments must be made, and the costs of various column spacings and framing must be considered before the columns are definitely located. The main aisles or the aisles opposite the entrances of the building



Fixture Plan. Meyer Brothers' Department Store, Paterson



Side Aisle Showing Wall Fixtures and High Display Cases
Meyer Brothers' Department Store, Paterson

Center Display Case and Typical Aisle Display Case, Saks-Fifth Avenue, New York
Starrett & Van Vleck, Architects

are necessarily wider than others, and the columns must be spaced accordingly. The resulting spacing may be any distance from 18 or 19 feet up to 30 feet and more. Obviously, a fairly wide spacing is desirable on account of the large open floor areas. As the interior column spacing often varies, the exterior wall columns are usually spaced more or less independently to fit the exterior design.

Wiring. Store fixtures require electric connections for display lighting, and it is advisable to install an electrical connection at the base of each column or a junction box in the under-floor wiring system to serve each "island." The wiring for the telephone service should be installed in conjunction with the work, serving all desired points. A tube system also requires the installation of a great many pipes, and these must be located by the fixture architect in order that they may be installed during construction.

Ventilation. In the ventilation of a modern store building, the air in the first floor and basement is usually exhausted through outlets in the floor connecting to the duct system, outlets which are distributed throughout the sales area. These must be arranged to come up in the fixtures, and they are usually provided with grilles in the faces of the counters or display cases.

Belt Conveyors. The larger stores usually employ a system of moving "belt conveyors" at the basement ceiling to collect smaller packages from the first floor. Holes are provided in the floor to permit the packages to be dropped onto the belt, and this feature must also be taken care of in the general construction in relation to the store fixtures.

Finished Floors. Since past experience has shown that any floor plan is subject to change and alteration, it is an advisable economy to cover the entire floor surface with a finished floor which may be of marble, terrazzo, linoleum or rubber composition, or wood. By this practice an alteration may be quickly made, new aisle spacing created, and the finished floor is all ready to receive it. It is also desirable to have this floor as level as possible, since the pitch in the floor, if any, must be taken up in the base of the fixture, as the tops and shelves must always be level. A slight pitch in a fixture would cause sliding doors to roll out of position.

Unity of Design. With proper thought and coöperation between the architect and the fixture architect, the interior treatment of the building may be planned in a style which will show harmony of detail and character. Elevator doors, plaster ornament, ceiling panels, wood wainscot and fixtures can and should be so designed as to have something in common, which will create, in the eyes of the customer, an impression of coördinated beauty, and furnish an atmosphere in

Spaciousness Demanded by Modern Merchandising
Showing Special Display Cases

Wall Fixtures and High Display Cases,
Fresh Air Inlet Grilles Above

Saks-Fifth Avenue, New York
Starrett & Van Vleck, Architects

which it is a pleasure for patrons to shop and buy.

Making of Plans. The type of store, the methods of merchandising, the funds available, and the plans for the future will determine the style, floor plan and details of construction and finish. When it is realized that the initial cost of the installation of fixtures may run to over $1,000,000 in a large store, and that the average fixture remains in place approximately 3½ years before it is shifted to another location (with the exception of the first floor fixtures, which are shifted more often), one can comprehend the necessity for making a painstaking analysis of the fixture plans and for having the most complete information available at the outset. After a competent fixture architect has been engaged, the first step is the making of preliminary plans. Every department store or chain of stores of any consequence has or should employ at all times in some official capacity a man who has not only a technical training but a department store training as well. This individual should act as the "liaison" officer between owners, architect and fixture architect.

There are no hard and fast rules for the layout of a department store; what holds good in one city or store may be just the reverse in another location, and there is an exception to every rule. The present and the contemplated future sizes and amounts of business of the various departments, and the ideas of the various buyers, department heads and floor managers, must all be collected and analyzed. For gathering this information the "liaison" man is necessarily valuable. Of course the fixture architect could lay out a new store in a strange city, relying only upon his knowledge and past experience, and there is no question but that in many respects it would be desirable and practical, but it is best to gather information of all the local conditions through all channels possible.

The General Arrangement of Departments. In a large store of five stories or more the arrangement might be:

First Floor. Jewelry, novelties, leather goods, handkerchiefs, neckwear, toilet articles, umbrellas, haberdashery.

Second Floor. Silks, wash goods, corsets, lingerie, blankets, boys' clothing.

Third Floor. Suits, cloaks, dresses, infants' wear, millinery.

Fourth Floor. Shoes, sport clothes, beauty parlor, evening gowns, furs.

Fifth Floor. Household furnishings, rugs, carpets, pianos, furniture.

In a taller building, the household furnishings, furniture, art and lamp departments, display rooms, etc., would probably be expanded proportionately on the upper floors. In recent years, the basement, which was once used for delivery or for the sale of hardware, crockery, etc., has become more valuable when used as a so-called "bargain basement." Many merchants have found this floor to be most convenient for the quick sale of lower priced articles covering the general range of cloaks, suits, shoes and wearing apparel. However, any plan decided upon must

Special Display Cases Are Often Necessary
Saks-Fifth Avenue, New York
Starrett & Van Vleck, Architects

be more or less flexible, as all departments are subject to enlargement or contraction, subject to seasonable selling, and a well planned layout will permit of such rearrangement without alterations of any consequence in the fixtures.

Fixtures and Arrangement. Certain manufacturers make fixtures of stock sizes and design which may be incorporated into a general scheme with probable savings in cost. The purchase and use of fixtures manufactured especially for a particular store not only permit the use of a design individual to the store, but may allow for a certain amount of flexibility in planning. The cost and desired effect usually determine the procedure in this regard.

The modern tendency, in the selling of wearing apparel particularly, is to carry a very small amount of exposed stock. This has diminished the number of hanging and clothing cases, the stock being kept in stock rooms directly on the floor, formed by a rectangular arrangement of display cases or partitions enclosing them. With styles changing rapidly, the store may carry a greater or less amount of stock without the fact being apparent to the public. This arrangement usually permits large open areas which are suitably arranged with tables, settees and chairs to enable the purchaser to relax and feel at ease while the individual garments are brought out for inspection. The rapid growth of small "specialty shops" adjacent to large stores has caused the large stores to construct within their buildings special "salons" or departments of individual design to meet this competition. These are designed to simulate the appearance of a small shop for the sale of a particular style of gown or hat, youths' clothing, important styles, etc. In most stores the constant change of styles, competition, and unusual increase or decrease of sales in certain departments require changes or alterations to the interior arrangements continually during the lifetime of the store.

Aisle Spacing. A 14-foot to 18-foot width between counters for main aisles will provide not only ample room for pedestrian traffic but will also permit the placing of tables and bargain squares at rush seasons of the year. Aisles without tables, which are not main aisles, if made 8 feet wide will be found practical. If tables are placed in the aisles, a minimum width of 4 feet should be provided on each side of the table. Aisles on the upper floors will of course be much wider where the floor space itself is used for selling and display purposes. A minimum aisle width of 2 feet should be allowed at the rear of a fixture as working space for the employes.

Show Cases. The average show case is 40 inches high; 20 to 28 inches wide, and the length varies to suit conditions. The show case usually has a glass top, front and ends, sliding mirror doors in the rear, reflectors and glass shelves on adjustable metal brackets. The exposed bottom of the show case usually has veneered finish, with drawers below if the base is run to the floor.

Display Cases. These are quite similar to show cases in construction and finish. The height varies from 3 feet to 7 feet; width from 6 inches to 4 feet, and length to suit conditions. If small merchandise is to be displayed, glass shelves and mirror back will be used; if larger items are to be displayed and the shelves omitted, a veneer panel back will be more effective.

Counters. The width of counters varies from 1 foot, 3 inches to 4 feet; the average height is about 2 feet, 9 inches, and in most cases the counter top overhangs the body of the counter from 3 inches to 7 inches. All exposed surface should be of finished wood as selected, with a glass or linoleum top over the finished wood counter. The interior of the counter may have drawers or open bin spaces for holding stock as desired.

Tables are of two types; the first is similar to a library table with free-standing legs, and the second type has an entirely enclosed bottom, either with shelves protected by paneled veneer sliding doors or holding drawers. If the drawers are large, they should roll on patent extension drawer slides. The average table height is from

Low Center Fixtures Add a Sense of Spaciousness
Lord & Taylor Store, New York
Starrett & Van Vleck, Architects

30 inches to 33 inches, and a removable rim about 3 inches high is a valuable addition to provide for each table. The length and width vary in accordance with the amount of the space available.

Center Fixtures. These fixtures, behind counters, vary in height from 4 feet, 10 inches to 5 feet, 6 inches. If the height is kept down and a clear view allowed over the entire floor, a pleasing effect of spaciousness is secured. It is advisable that the tops of center fixtures be made of the finished wood. A minimum width of 4 feet from outside to outside will be found practicable with the drawer cabinets or display cabinets, being built in between the pilasters so that they are removable or inter-changeable except where special sizes may be necessary. If cash registers, wrapping desks or tube stations are to be built in as part of a center fixture, the necessary details for receiving pipes, power, etc., must be allowed for. Where stock is kept on shelves, the shelves should be removable, and if a panel back is built into the fixture, it can be quickly converted into a display cabinet. Glass sliding doors held in metal frames on the fronts of these fixtures not only allow the merchandise to be displayed but also keep the dust from reaching it. If a display case is used, the bottom of the case should be kept at least 2 feet from the floor, as the customer cannot see below that point when standing in the aisle.

Wall Fixtures. The average height of a wall fixture proper will vary from 6 feet, 6 inches to 7 feet, including the main cornice. On top of this are often erected display cases or stock storage spaces, the height of which may be from 2 feet to 6 feet, sometimes bringing the total height of wall fixtures to 12 feet. The depth of the wall fixture should be kept at 2 feet, on the average. It has been found that the highest point to which the average sales person can reach, without the aid of a stool or ladder, is 6 feet, and for this reason it is not advisable to erect either a drawer cabinet or shelf any higher than this. If a display case is erected above, it should have panel back, glass sliding doors, and should be illumi-

nated with reflectors. Display cabinets or drawer cabinets in the fixture proper should be built in between the pilasters so as to be removable. Drawers may be either of uniform sizes or built especially to receive the different articles to be held. Bins also should be sized and constructed so as to hold the specified goods or articles designated. In the layout of wall fixtures, allowance must also be made for the entrances to show windows. Space should be provided which will make entrance and exit convenient.

Hanging Cases. With the exception of the children's and infants' departments, hanging cases will average 6 feet, 6 inches in height, with the hanger not more than 6 feet from the floor. The interior may be finished in the same manner as a display case with reflectors. The width should be 2 feet, 6 inches minimum, and the length varying to suit conditions. The front may have either swinging doors or sliding doors of glass in wood or metal frames (the sliding door is preferred). As explained previously, the tendency at this time is to use hanging cases mainly for display.

Fitting Rooms. These should be made as attractive as is possible. The size should be 6 feet, 6 inches by 6 feet, 6 inches. Full length mirrors set at the proper angle with reflectors should be installed so that the customer may have the most advantageous view of apparel being tried on. If natural wood finish is used, there is an opportunity to employ fine veneered wood panels. The average height of the walls is from 6 feet, 6 inches to 7 feet. Proper precautions must be taken to insure ample ventilation.

Special Salons. The special rooms or "salons" for the display and sale of millinery, furs, evening gowns, furniture, etc., afford an opportunity to create a setting of beauty and interest. The rooms may be done in the styles of the different periods or in the mode of the new "modern" which is now so popular. Beauty parlors, restaurants, etc., also permit of special designs not conforming directly to the store architecture.

Column Enclosures. These can be made more than just boxes around the columns by the choice of select veneer, and by special ornament and the installation of mirrors they can be made not only useful but attractive.

Cash Stands, Tube Stations and Wrapping Desks. The location of these stations is very important, and special consideration should be given this question, as the efficiency of completing a sale in the shortest elapsed time depends on the proximity of these units. To all of these, service spaces must be allotted for cash books, paper bags, twine, tube pipes, carriers, etc. The sizes vary according to the amount of business to be handled at any given point.

Lumber and Veneers. The term "best quality," when used for cabinet work, should mean nothing but the best. In the past, oak, birch, mahogany and walnut have been used extensively for store fixtures, but in recent years walnut has been used almost exclusively. Rosewood is perhaps the best for show case rails and edges of counters; it has a fine appearance and is a very hard wood, which permits the use of a small cross sectional area, as well as withstanding hard knocks and rough usage from handbags, umbrellas, etc. The "modern" treatment of special rooms has introduced numerous new veneers of beautiful design.

Glass, Hardware, Reflectors. Glass and mirrors have an important effect on the display and should be of the best quality. Hardware is also a very large item in cabinet work, and the selection should be made carefully and a complete schedule furnished. Hardware may be of statuary bronze, brush brass, nickel plate, or other material as desired. Proper illumination plays an important part in the display of merchandise, and tests have proved that by increasing and correcting the illumination on merchandise displayed, the percentages of sales consummated increased from 20 to 40 per cent. The finish of the exposed metal on the reflectors should match the hardware. Provisions for wiring and attaching the lighting equipment must be provided in the construction of the fixtures. The reflectors specified should be selected from the stocks of those firms which have specialized in this phase of lighting.

The marble base, if any, is generally ⅞-inch thick and of height specified, and is held in place by screws, which are countersunk with the heads neatly waxed over so as to be invisible.

Finishing of Wood. The firms with the best standing in the manufacture of store fixtures have gained their prestige in a large measure by the emphasis placed on workmanship in the finishing of their work. Good finishing requires good workmen, good material, and time. The natural wood which will be exposed should be well sandpapered, given one coat of stain, one coat of filler and three coats of shellac or varnish, as may be desired, each coat being well rubbed before the application of the next. The softer wood and unexposed wood should receive one coat of stain to match the general finish, and two coats of shellac.

Setting Up Fixtures. Fixtures should be fitted together in the factory during the course of construction so that they can be marked. When they are brought to the store, it will be necessary only to scribe them and bolt them together, thereby preventing any loss of time. The finish should also be completed at the factory, and no stain or finish should be permitted to be used at the building.

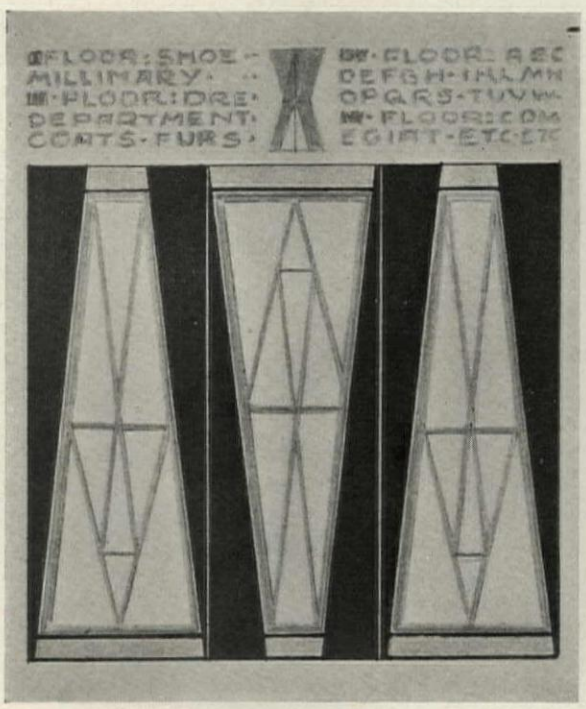
STORE ELEVATORS AND ESCALATORS

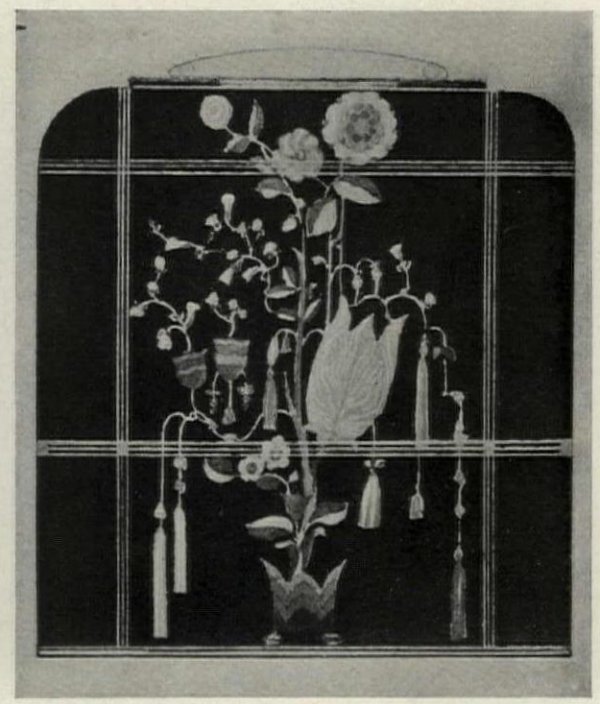
BY

THEODOR CARL MULLER

UPON the dictates of fashion and the modern science of merchandising rests the solution of the problem of department store traffic. If the architect lives up to the laws of both, he has succeeded, and in so doing he must achieve the *chic* and the economical by the same means. So long as the *chic* or tone of a large store depends upon a Spanish Renaissance interior or a building permeated with suggestions of the Roman Empire, his problem is to minimize the incongruity of elevators and escalators. In the domed and bemirrored interior of an elevator he may find a somewhat pleasant compromise, resembling the powder room in some palace of antiquity, but costume the thin steel span of an escalator in the manner of ancient stairways, he cannot. One turns hopefully to the fashion of the so-called modern movement, because it alone offers a flexibility which might incorporate under the same roof, smartness, scientific layout, and the design of elevators and escalators that will beautifully express their inherent qualities.

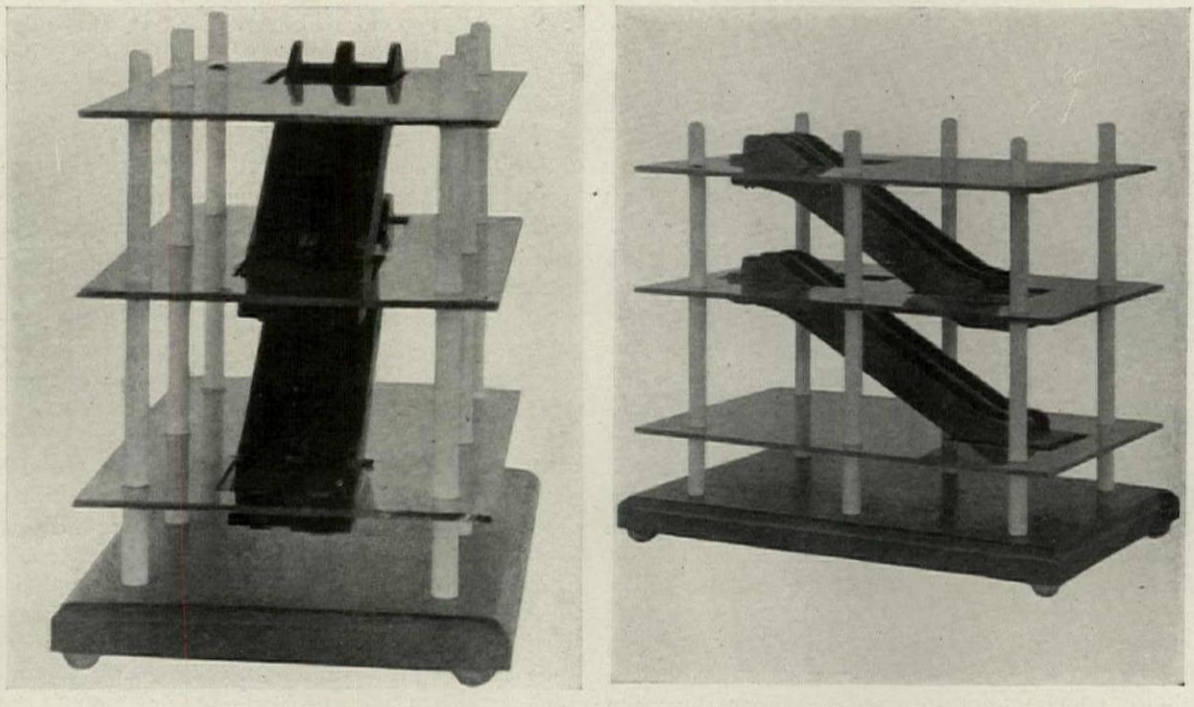
In the department store inadequate vertical transportation facilities so often exist undetected, even over a period of years, that the necessity of an expert solution of the individual problem is more urgent than in the office building, where faulty planning of the traffic results in recognizable symptoms. Whereas an office building tenanted to the extent of its capacity necessary to its financial success will give immediate indication of unsolved transportation problems in the complaints of tenants, it is not so with the customers of a store who, far from clamoring for their needs, will merely go elsewhere. The clientele quickly and quite imperceptibly proportions itself to the facilities of the store, and out of this distinguishing characteristic there arise the determinants of transportation and traffic service. The proportioning of these to the merchandising capacity of the store is imperative. Ostensibly there is greater danger of limiting that merchandising capacity than in incurring increased overhead due to ample provision for traffic. The expert will begin with the merchandising factors and arrive at a ratio of customers per hour to the transportation area or the square footage above the first floor minus dead space. In an active metropolitan department store this calculation may result in such a ratio as one customer per hour to every 25 square feet, or in some stores it may run as low as 1 to 60. This ratio is usually based on the peak load of an average busy day with due regard for Easter and Christmas rush





Drawings of the Elevator Doors and Elevator Interior, Bedell Store, New York

Designed by Joseph Urban, Architect



Model Showing Parallel Arrangement of Escalators in Center of Bay

periods, into which one third of the total annual sales may be concentrated. However, from this proportioning of sales activity to formula, the expert can arrive at a definite volume of traffic.

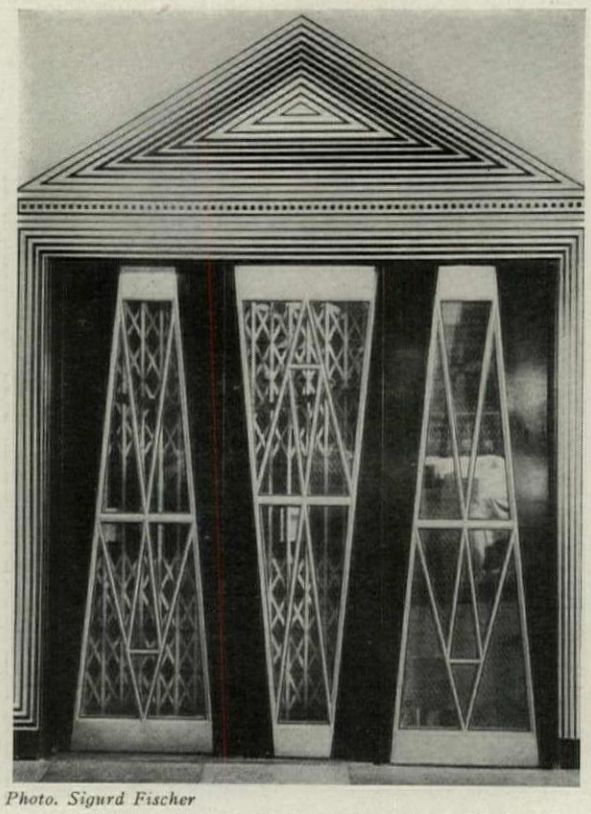
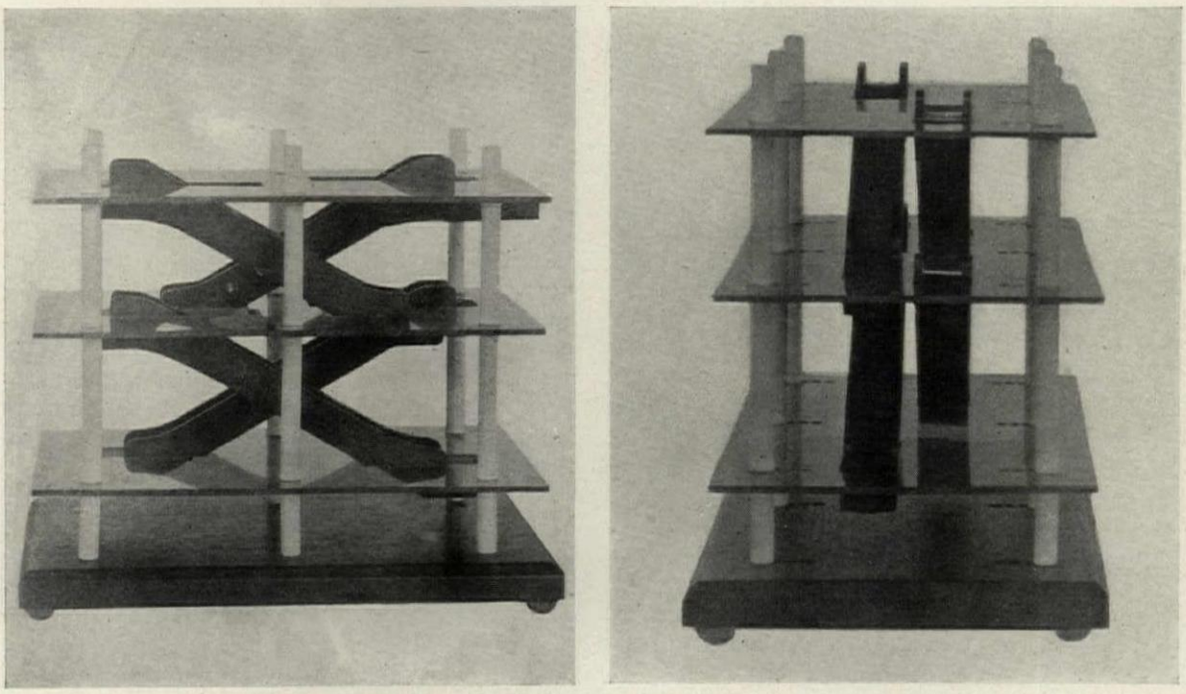


Photo. Sigurd Fischer

Elevator Doors, Bedell Store, New York

Designed by Joseph Urban, Architect

In contrast to the office building, where speed and height are criteria, the problem of the department store is quantity transportation, and that is why the escalator unit with a maximum capacity of 8000 passengers per hour figures prominently in the layout. The maximum capacity of the average elevator unit is 400 passengers per hour, —but one twentieth of that of an escalator. While the use of escalators would hardly be substituted for all elevators, their elimination of waiting and crowding places a large proportion of the traffic on them. Their further advantage to the store lies in their continuity of motion, low power cost, independence of operators, and their reversibility, which permits of doubling their efficiency in either direction, a feature useful during the opening of large sales and for the rapidly controlled emptying of the store at closing time. "Data collected from a large number of stores show that with both escalators and elevators there were double the number of customers on the upper floors in proportion to the entrance traffic as compared with adjacent stores of comparable sizes and having elevators only." However, one powerful argument for escalators is their sales promotion quality, carrying customers through departments of the store they might not frequent, and giving them a broad view of the display of goods on each floor. This involves the value of the power of suggestion in merchandising. Determining the escalators in R. H. Macy & Company's store, a total of forty units with a capacity



Model Showing Criss Cross Arrangement of Escalators in Center of Bay

of 8000 passengers per hour each, a ratio of 1 to 19 was used, which is the more exceptional considering that a future increase of sales and transportation facilities is expected, lowering the factor of 19 square feet. In this instance the escalators carry 80 per cent of the total transportation. The largest escalator installation will be in the Kaufmann store in Pittsburgh,—a total of 66. This is a far cry from use of the first escalator, operated at the Paris Exposition of 1900.

Good planning generally leads to the placement of escalator units in the main artery of circulation, presenting them as a first choice to the public and offering their view of the entire floor. Elevators are divided into groups and distributed for convenience. Escalators are made in inside dimensions between balustrading of 2, 3 and 4 feet, carrying a maximum of 4,000, 6,000 and 8,000 passengers per hour respectively. They run on the standard angle of 30 degrees and at the standard rate of 90 feet per minute. There are two types. The "flat step type" up, down and reversible, is generally used in fixed direction escalators because reversibility demands a shunt at both top and bottom landings. The "cleat step type" up, down and reversible, has a comb at the landings and may always be reversed. Motors for each unit are placed underneath the floor at the top of the incline.

Three-dimensionally, the escalator may appear extremely large; that is a problem of design, but in actual floor space an escalator having a capacity of 4,000 persons per hour requires only 84 square feet at both upper and lower landings, making a total of 168 square feet on two separate floors. There are two usual arrangements. The parallel arrangement, as shown in the model, or with an aisle between, is generally used when it is required to take passengers from and deliver them into the same cross aisle space. Continuity from floor to floor is possible only where the aisle is provided between. The criss-cross or bucksaw as shown in the model is best used where continuity from floor to floor is desired. If an aisle is placed between, it is crossed by the continuing passengers, so that this arrangement is most effec-

Escalators in the Macy Store, New York
Robert D. Kohn & Associates, Architects

Escalators Separated by Show Case in Selfridge, Ltd., Store, London

tive where the escalators are planned to be adjacent.

In planning elevator groups very little arises in the special cases of stores in variance to the general elevator problem. Express cars would only exist in special cases where there are top floor restaurants, auditoriums or exclusive service to a specialty shop. The local cars designed for "quantity" and stopping at every floor should be as large as convenient entry and egress will permit, maximum dimensions being 6 feet in depth and 7 in width. The electric elevator has superseded the plunger and hydraulic elevators because of its economic superiority, but it need not be designed to exceed a velocity of 500 feet per minute. A satisfactory signal system is the "dial and light," whereby the passenger may determine at leisure for which car he (or more often *she*) will wait. The general practice of stopping at each floor whether signaled or not is advisable in department stores because it may suggest purchases to the passengers each time the door is opened, and it facilitates general circulation, though it may slow up the definite round trip. In design the elevator car and landing doors offer opportunities for luxury and comfort uncalled for in other buildings. The department store elevator is one of the few remaining in which a bench across the back of the car can be justified. Decoration and the placement of frames for posters is a matter of taste, but the use of mirrors in some form, whether covering the upper walls entirely for spaciousness or framed small for economy, is a matter of catering directly to the nature of the store's clientele. In high velocity elevator service mirrors have been advised against as a distraction and an indirect cause of landing door accidents. In the department store services the danger is less, but remains a factor to be weighed against their popularity.

In the Bedell Store, New York, the architect, Joseph Urban, has designed an extremely decorative car, the effect of which is only suggested in these illustrations, since the colors of the stylized flowers are brilliant against the black lacquered steel. Picture this car operated by a small Japanese girl in jade green pajamas, and you have an example of a *tour de force* peculiar to the problem. Obviously, glass is often favored in the landing doors, but their design should be such that no one need search for them. Certainly with them as with the car itself every detail should be as distinguished as the store itself, and the utmost be made of the chance afforded to impress customers favorably.

Designing escalators seems still to belong to the field of the engineer. The architects' opportunity is in creative design, for while a Renaissance design may conceal a splendid steel elevator cab, nothing can hide an escalator. The escalator will always jeopardize its antique balustrading! Fine materials used honestly will easily redeem it from its stark utility, if necessary. Lacquer colors or fine wood veneers may be applied to its housing. The treads of the steps may be painted, and moving hand rails provided in a variety of cast rubber tones. Whereas lightness of coloration recommends itself to effect spaciousness for confining walls of an elevator cab, for the escalator dark coloration affords a diminution in apparent dimensions,—or in both cases the use of mirrors or highly polished surfaces tends to camouflage with reflections the existence of overpowering forms or planes.

An unusual escalator treatment is that in the store of Selfridge, Ltd., London, where the up and down units of a parallel arrangement are separated by a show case flush with the rail and extending the full available length. At one time the use of advertising and display in the elevators of a large New York store was proposed, but it was rejected not only because distracted passengers might run by their stops but also because of the display limitations. There is some difference of opinion as to the wisdom of using an escalator showcase because of the advantage which lies in the view of counters where actual sales take place. However, the illustration shows that the showcase is hardly visible to the descending passengers who naturally take a better view of the ground floor than those ascending, who are more interested in the second floor.

KITCHEN EQUIPMENT FOR DEPARTMENT STORES

BY
WILLIAM DOESSERECK

THE planning of a kitchen and the arrangement of its equipment call for the consideration of several items: (1) Type of service; (2) Number of meals to be served; (3) Number of persons per meal; (4) Number of persons per seating; (5) Location of kitchen in relation to restaurant; (6) Method of provisioning kitchen; (7) Location of receiving room,—if located on upper floor, what elevator service is available; (8) Disposal of garbage,—what provision should be made for handling and storing of refuse. In addition, light and ventilation must be provided and, where at all practical and a choice of location will permit, the kitchen should be located so as to secure natural light and ventilation, which is preferable to artificial conditions. It should be noted that in some cities kitchens and bake shops cannot be placed in basements or areas without natural ventilation.

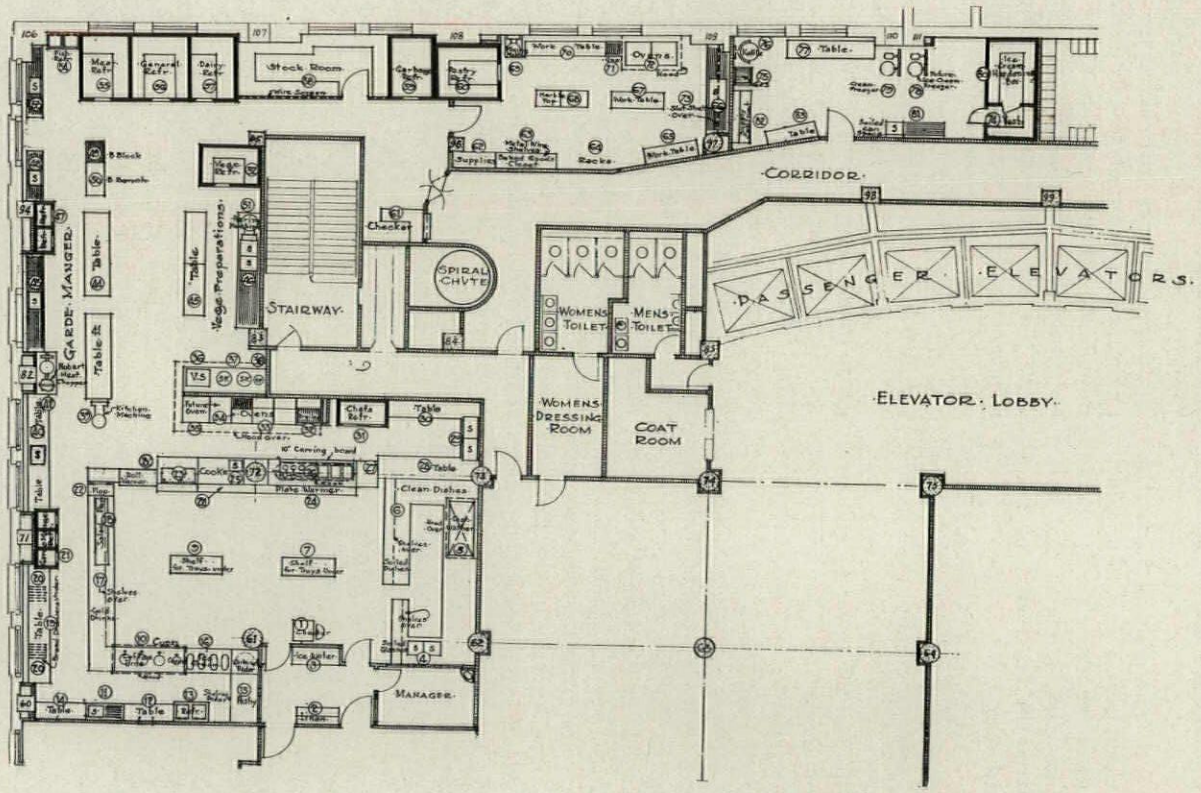
Efficient Planning. After the location has been decided upon, the general plan of the kitchen should be developed, keeping in mind the rotation of service and the necessity of having every part of the kitchen accessible in the order of culinary operations so that the service may be continuous with as few steps as possible by cooks, waiters and bus boys. A layout requiring cross travel or counter-rotation of service should be avoided. The layout should be planned to require the minimum amount of help, so that the number of employes may be changed as conditions demand without detriment to the service standards to be maintained. Efficiency and prompt service should never be sacrificed. The location of the kitchen with regard to the dining room should be such that the distance to be traveled between the kitchen and the farthest table in the dining room shall be as short as possible. With this arrangement the hot foods will not be cooled in serving. The arrangement of departments should be in the order of their importance and the type of kitchen, keeping together all work requiring heat, and grouping that requiring chilled or cool service, to permit better control of operation and ventilation. The exact location of the various departments depends entirely on the meals to be served. Cafeteria and "quick lunch" service will require that the kitchen be as close as possible to the service bars and allow direct access for replenishing the supplies.

Services. A separate room should be provided for dishwashing in order that the noise and heat may be isolated from the restaurant. Service pantries should be provided as cut-offs between kitchen and restaurant, thus minimizing noise and aiding in keeping out odors. Ample space should be provided for receiving and storing supplies, arranged to require the simplest system of storekeeping, and allowing for careful supervision of all supplies. There should be but one supply entrance from the outside and into the kitchen. The preparation spaces, bakery, pastry and ice cream shops should be kept as close to the service portion of the kitchen as practical, but still out of the way, bearing in mind that the whole arrangement should be compact and yet spacious enough for proper working, easy cleaning, minimizing the distance of travel for service to patrons. Adjacent to the dishwashing room should be a soiled linen room where the linen may be gathered up and bagged, ready for the laundry. A clean linen service room should be placed adjacent to the service pantries where the linen may be sorted and stored until required for use. Storage space should be provided for spare and surplus stock of dishes, table tops, etc.

Ventilation. The matter of ventilation is of great importance. It should be ample to change the air in the kitchen, pantries, etc., at least every three minutes. Special care should be taken to provide ample ventilation for the service counters or bars, giving particular attention to the hoods over coffee urns, as the odor of coffee will penetrate an entire building if the ventilation is not handled properly. The ventilation of the range and dishwashing rooms should be separated from that of the remainder of the kitchen. The range duct work should be provided with adequate fire dampers and bypass around the fan, and the duct work from the dishwashing room should be made watertight and self-draining.

Garbage Disposal. A refrigerator should be installed for the storage of garbage in cans pending its removal at pre-determined periods. The refrigerator box should be arranged to receive two cans for every 70 persons served. This will allow about 100 per cent of surplus in case of Sunday left-overs, etc. The disadvantage of handling garbage in this manner is the possible loss of silver and theft of merchandise, particularly in department store buildings where articles have been placed in the cans and covered with garbage in order to permit of their transportation out of the building. The importance of careful insulation of a refrigerator box or brine pipe line is a matter deserving special attention, since the value of insulation is only that of its weakest point.

Kitchen Fixtures and Details. The arrange-



SCHEDULE OF CONNECTIONS.

No	ITEM	GAS	HW	CW	WASTE	STEAM	RET	MOTOR	REMARKS
1	Checkers Desk	—	—	—	—	—	—	—	
2	Linen Cabinet	—	—	—	—	—	—	—	
3	Drinking Water	—	—	¾ DW	1½"	—	—	—	Brine
4	Sinks	—	¾"	¾"	2"	—	—	—	
5	Dishwasher	¾"	¾"	¾"	2"	¾"	—	½HP	
6	Serving Table	—	—	—	—	—	—	—	
7	Set Up Table	—	—	—	—	—	—	—	
8	Roll Warmer	—	—	—	—	½"	½"	—	
9	Set Up Table	—	—	—	—	—	—	—	
10	Cold Water	—	—	¾ DW	—	—	¾ DW	—	
11	Sink	—	¾"	¾"	2"	—	—	—	
12	Table	—	—	—	—	—	—	—	
13	Refr.	—	—	—	1½"	—	—	—	Brine
14	Table	—	—	—	—	—	—	—	
15	Pastry	—	—	—	—	—	—	—	
16	Soda Fountain	—	—	¾ DW	1½"	—	—	—	Vent Brine
17	Shelves	—	—	—	—	—	—	—	
18	Salad Pan	—	—	—	1½"	—	—	—	Brine
19	Table	—	—	—	—	—	—	—	
20	Bread Drawers	—	—	—	—	—	—	—	
21	Garde Manger Refr	—	—	—	1½"	—	—	—	Brine
22	Flap	—	—	—	—	—	—	—	
23	Bain Marie	—	½"	—	1½"	½"	½"	—	
24	Plate Warmers	—	—	—	—	¾"	¾"	—	
25	Sink	—	¾"	¾"	2"	—	—	—	
26	Steam Table	—	½"	—	1½"	¾"	¾"	—	
27	Rack for Pots	—	—	—	—	—	—	—	
28	Table	—	—	—	—	—	—	—	
29	Sinks	—	¾"	¾"	2"	—	—	—	
30	Table	—	—	—	—	—	—	—	
31	Chefs Refr.	—	—	—	1½"	—	—	—	Brine
32	Broiler	1¼"	—	—	—	—	—	—	
33	Ovens	2¼"	—	—	—	—	—	—	
34	Salamander	¾"	—	—	—	—	—	—	
35	Future Oven	—	—	—	—	—	—	—	
36	Vege Steamer	—	—	—	—	¾"	¾"	—	
37	Steam Kettles	—	¾"	¾"	—	¾"	¾"	—	
38	Small Pot	—	—	—	—	½"	½"	—	
39	Kitchen Machine	—	—	—	—	—	—	1HP	
40	Table	—	—	—	—	—	—	—	
41	Table	—	—	—	—	—	—	—	
42	Meat Chopper	—	—	—	—	—	—	2HP	
43	Sink	—	¾"	¾"	2"	—	—	—	
44	Table	—	—	—	—	—	—	—	
45	Table	—	—	—	—	—	—	—	
46	Sinks	—	¾"	¾"	2"	—	—	—	
47	Refr.	—	—	—	1½"	—	—	—	Brine
48	Sink	—	¾"	¾"	2"	—	—	—	
49	Butchers Block	—	—	—	—	—	—	—	
50	" Bench	—	—	—	—	—	—	—	
51	Paring Machine	—	—	¾"	2"	—	—	1HP	
52	Vegetable Refr.	—	—	—	1½"	—	—	—	Brine
53	Sink	—	¾"	¾"	2"	—	—	—	
54	Fish Refr.	—	—	—	1½"	—	—	—	Cracked Ice
55	Meat Refr.	—	—	—	1½"	—	—	—	Brine
56	Seperal Refr.	—	—	—	1½"	—	—	—	Brine
57	Dairy Refr.	—	—	—	1½"	—	—	—	Brine
58	Stock Room	—	—	—	—	—	—	—	
59	Garbage Refr.	—	—	—	1½"	—	—	—	Brine
60	Pastry Refr.	—	—	—	1½"	—	—	—	Brine
61	Checkers Desk	—	—	—	—	—	—	—	
62	Supplies	—	—	—	—	—	—	—	
63	Baked Goods Clo	—	—	—	—	—	—	—	
64	Racks	—	—	—	—	—	—	—	
65	Work Table	—	—	—	—	—	—	—	
66	Sink	—	¾"	¾"	2"	—	—	—	
67	Work Table	—	—	—	—	—	—	—	
68	Table Marble Top	—	—	—	—	—	—	—	
69	Mixing Machine	—	—	—	—	—	—	1HP	
70	Work Tables	—	—	—	—	—	—	—	
71	Gas Stove	¾"	—	—	—	—	—	—	
72	Ovens	1¼ 2"	—	—	—	—	—	—	
73	Slot Shelf	—	—	—	—	—	—	—	
74	Vent to Working Space	—	—	—	—	—	—	—	Brine
75	Gas Stove	¾"	—	—	—	—	—	—	
76	Tilting Kettle	—	—	—	—	¾"	½"	—	
77	Table	—	—	—	—	—	—	—	
78	Pot Ice Cream Fr.	—	—	—	—	—	—	2HP	Brine
79	Ice Cream Freezer	—	—	—	—	—	—	2HP	Brine
80	Ice Cream Hard Box	—	—	—	1½"	—	—	—	Brine
81	Sink	—	¾"	¾"	2"	—	—	—	
82	Supply Cabinet	—	—	—	—	—	—	—	
83	Table	—	—	—	—	—	—	—	

PLAN OF KITCHEN AND SCHEDULE OF CONNECTIONS; DAVISON-PAXON CO., ATLANTA.
STARRETT & VAN VLECK, ARCHITECTS; HENTZ, REID & ADLER, ASSOCIATED

ment of the kitchen should be such that it may be readily cleaned and easy to maintain. The floor should be waterproof and the drainage piping arranged so as to be accessible. Piping run above the floors should clear it to avoid dirt pockets. Ample cleanouts should be provided, and provision should be made for flushing lines with steam and hot water. The drains for sinks and dishwashers should be taken through a grease trap, and the trap should be large enough to retain the grease. Monel metal is a desirable material for the use of finished pieces of equipment, except where cost makes it prohibitive, because of its wearing and cleaning qualities. The large kettles may be of aluminum or copper, preferably the former, since at a slight increase in first cost they are readily cleaned. They are also very durable and do not require re-tinning from time to time. The dishwasher should be of copper, as the hot water and washing powder tend to corrode the galvanized type, resulting in short life.

The refrigerators should be carefully designed, giving thought to accessibility and cleanliness. Very often the boxes may be grouped together and built of concrete with cork insulation. The hardware should be rugged and designed for hard service. No set rule has been made as to the exact number of fixtures required. There is a general tendency to over-fixture a kitchen.

In estimating the requirements for kitchen equipment, the size and capacity of principal items can be calculated about on this basis:

Range: One section, 2 feet, 6 inches for each 100 persons.

Steam Kettles: One 25- or 30-gallon kettle and one 25- or 30-gallon roaster will serve from 250 to 300 persons.

One 40- or 50-gallon kettle and one 40- or 50-gallon roaster will serve from 350 to 450 persons.

Two 30- or 40-gallon kettles and two 30- or 40-gallon roasters will serve from 500 to 750 persons.

Three 30- or 40-gallon kettles and three 30- or 40-gallon roasters will serve from 750 to 1,000 persons.

Coffee Urns: A 3-piece battery (2 coffee and 1 water) for 1,000 persons. Figure 15 cups of coffee to 1 gallon.

Water Coolers: Cooling capacity 1 pint per person.

Steam Tables: A 5-foot unit (2 meats, 4 pots, 2 gravies) will serve from 100 to 250 persons.

A 6-foot unit (2 meats, 4 pots, 2 gravies) will serve from 150 to 350 persons.

A 7-foot unit (3 meats, 6 pots, 2 gravies) will serve from 350 to 500 persons.

(Steam tables generally run the lengths of ranges and steam kettles.)

Ice Cream: A battery of three 20-quart cans will give 600 portions, using a No. 10 scoop.

It is better to provide separate water coolers for furnishing drinking water for the restaurant and cafeteria service of the department store than it is to use water from the general drinking water cooling system of the building. In this way a lower temperature can be obtained, and the amount of water to be circulated through the building is reduced, thus avoiding circulation losses. In many cases the use of ice in the glasses has been eliminated. Provision should be made in the refrigerating plant for cooling boxes, drinking water and a certain amount of cracked ice for kitchen service use. Generally a ton per day for 500 to 1,000 persons is sufficient.

Fuel and Steam. Gas is usually employed for the ranges and ovens in larger kitchens, and steam for the balance of the equipment,—except in remote places where the rates are low enough to warrant the use of electricity. Dishwashers, kitchen mixing machines, vegetable parers, etc., are driven by electricity, and such equipment as toasters and grills require electric connections. In some cases it is necessary to use electricity for cooking in department stores irrespective of cost, where there is no gas available.

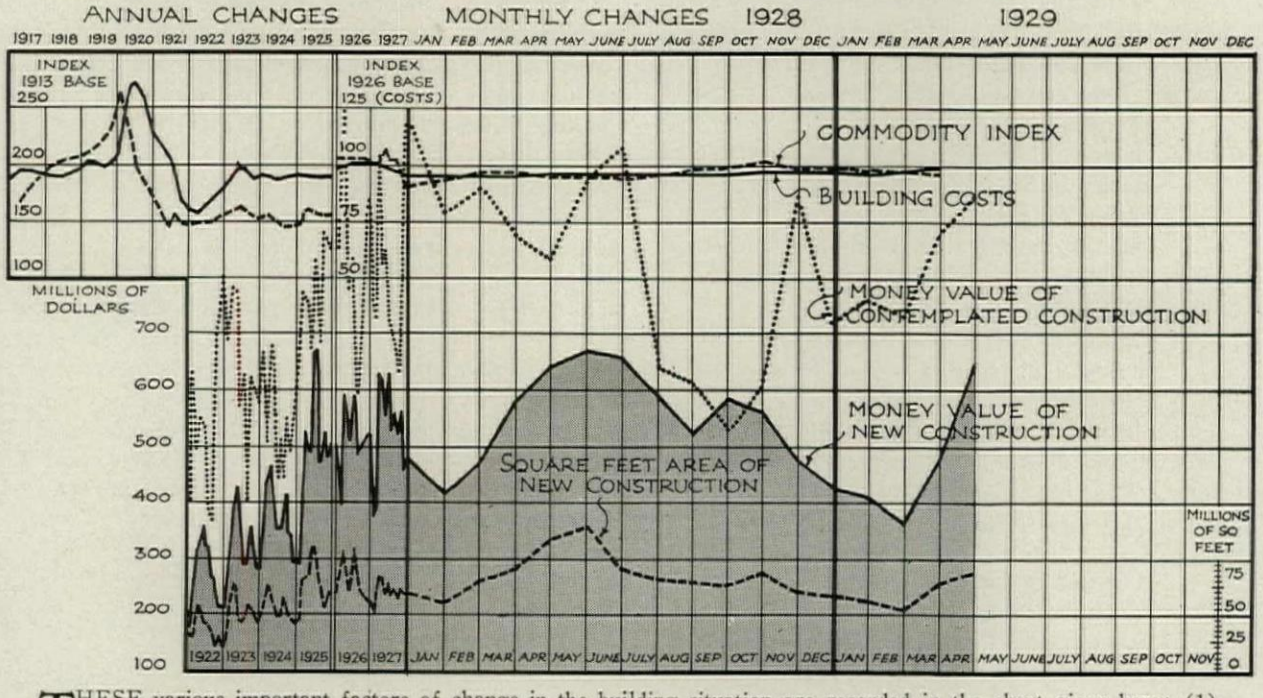
The steam pressure for steam tables, etc., should be not less than 20 pounds or more than 50 pounds, and provided with adequate drips, control valves, etc. Practically all steam fixtures can be arranged for operation with gas with the exception of the double-jacketed kettle. The latest addition to the gas heater appliances is the vegetable steamer.

The average steam requirements for kitchens seating from 300 to 500 persons is 25 h.p., and the annual consumption of steam will be approximately 1,800,000 pounds. For a general restaurant, the current consumption per meal in a completely equipped kitchen will approximate 400 to 500 watts.

THE BUILDING SITUATION

A MONTHLY REVIEW OF COSTS AND CONDITIONS

NEW construction figures for April give every indication that the quiet in building activities prevailing during the first two months of this year was a strictly temporary condition, which has now been definitely overcome. In the money value of contracts awarded, the current April total for the 37 eastern states of $642,060,500 represents the second highest April total on record, according to the F. W. Dodge Corporation. It is 32 per cent above the total for March, just below the high record April of last year, and a monthly total higher than any reached during the record-breaking years of 1926 and 1927. Of the eight districts comprising the territory east of the Rockies, all but Texas showed an increase for April as compared with March, and five of the districts showed more construction than in April, 1928. In the district which consists of New York state and northern New Jersey, April construction amounted to $169,079,700, which was 52 per cent higher than for March and 12 per cent ahead of April, 1928. In the New England states, April work totaled $40,930,200. This represented a falling off of 10 per cent from the figures for April of last year, but was 28 per cent higher than that of the previous month. In the middle Atlantic states, April construction was 80 per cent higher than that of the previous month and 3 per cent above April, 1928. The total was $106,136,700. In the northwest the April total of $10,984,000 was just double the total for March of this year and was 54 per cent higher than for the preceding April. In the southeastern states also the April construction was higher than either that of the preceding month or the corresponding month of the preceding year. The April, 1929, total was $65,790,600. This was 52 per cent ahead of March and 19 per cent ahead of April, 1928. Neither the Pittsburgh district nor the central west came up to the April, 1928 totals, but both exceeded the March figures. In the Pittsburgh district the total of $61,013,200 was 15 per cent ahead of March, but 19 per cent under the preceding April. In the central west the April total was $169,239,100, which was 6 per cent higher than March but 10 per cent below April of the previous year. In Texas the April construction amounted to $18,887,000. This was the only state in which April construction fell below that of March, with a drop of 10 per cent. The total was, nevertheless, slightly higher than the April, 1928 total, according to the reports.



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 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.

HEATING AND VENTILATING THE DEPARTMENT STORE

BY
WILLIAM S. GAYLOR

THE science of merchandising, as it is developed in the modern department store, recognizes the necessity and value of providing physical comfort to both patrons and personnel. To this end the heating and ventilating systems are contributing a large share. Conditions in the store must be such that the patron will not be conscious of discomfort even in the most congested area, regardless of existing atmospheric conditions on the street. The conditions in the store must also keep the sales force comfortable so that the employes will be able to give full attention to duty.

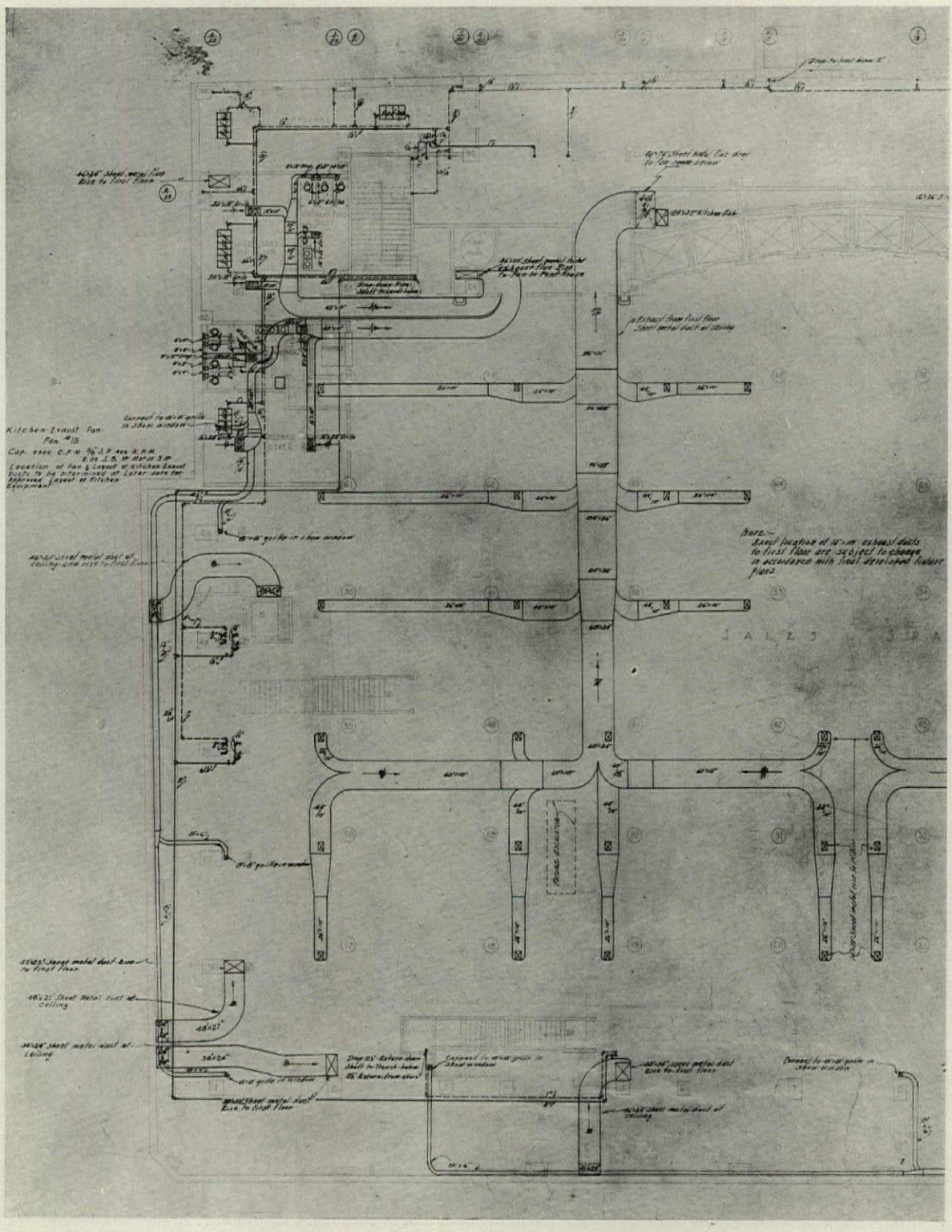
Areas above the first floor are generally heated by direct radiation. Due to the size of the building and the need of rapid circulation for quick heating up, the system best suited for the purpose is the two-pipe vacuum return system. The system should be designed to operate at a pressure of not over 5 pounds. Due to the necessity of keeping the basement ceiling free of large piping, the direct heating system should be of the down-feed type, with the distributing steam mains run on the ceiling of the top floor, exposed if the area is devoted to stockrooms, or in the furred ceiling if in sales space.

If the building is large, it is desirable to keep the size of the main steam riser at a minimum. This main riser carries steam at boiler pressure, with reducing valve at the level of the distributing main. The average store building requires the use of live steam at various pressures. The heating system, both direct and indirect, is usually operated at less than 5-pound pressure; hot water heating with steam at the same pressure; kitchen utensils require steam at from 35- to 40-pound pressure; pressing machines and other workroom appliances require steam at pressures of up to 60 pounds. To provide the necessary steam for these services alone, it is necessary to operate the boiler plant at a minimum pressure of from 60 to 75 pounds.

The space devoted to the boiler room should be kept at a minimum, due to the fact that in many cases this area must be excavated from rock, and also due to the value of space in this type of building. These factors require that the boiler be of such a type as can be operated at sufficient overload to produce the peak load with a minimum size of boiler. The water-tube boiler, with furnace volume for operation up to 200 per cent of rating, has been found to meet the condition required. A boiler of this type should have a height under the front header of not less than 12 feet. During the non-heating season the steam requirements are for hot water heating, for kitchen and workroom use. For this, it is necessary that at least one boiler be provided for summer use only. The steam requirement for the average department store per year amounts to approximately 3½ pounds of steam per cubic foot of space. The steam for hot water heating, kitchens and workrooms will generally amount to 10 per cent of the total annual heating requirements.

The selection of the proper fuel for the boilers is an important item for consideration. Fuel oil is particularly well adapted to this type of building. Good operating efficiencies can be obtained with this fuel. An evaporation factor of 13½ pounds can be obtained with the type boiler mentioned here. Fuel oil tanks are buried below the level of the boiler room; if the excavation is in rock, tanks are installed above this level. The use of a heavy oil of 14° to 16° is recommended in a plant of this type. An added value to the use of fuel oil in a store building is its cleanliness. The delivery of fuel oil is usually made at hours when street traffic is at a minimum, and without inconvenience to the store. There is also freedom from the dirt and labor of handling ashes. In large cities land value is such an important factor that floor area that can be devoted to selling must be figured at the maximum possible. Coal bunker space is naturally large and must be taken out of area that might be devoted to other uses. Even though the plant is to operate with fuel oil, it is necessary that some space be provided that can, in an emergency, be changed over to coal storage. It is also recommended that the boilers be so designed that coal-burning grates can be installed in a short time in case circumstances arise that curtail the supply of oil. The question of the kind of fuel to be used is also governed to a great extent by the geographical location of the plant in question. In certain locations in the middle west and north it is necessary that coal shall be the fuel. Each particular building presents an individual problem.

The direct heating system, as already said, is installed above the street floor level. Generally, the direct radiators are placed below the windows, hung on wall brackets, or, in the case of certain makes of windows, hung from hangers provided as part of the window aprons. Radiators should be hung not less than 8 inches above the floor to eliminate dust pockets. The higher class of construction provides for a pipe space behind the furring, so that all radiator branches from risers



One-half Plan of the First Floor of the Davison, Paxon Co. Department Store, Atlanta, Showing the Heating and Ventilating Layout

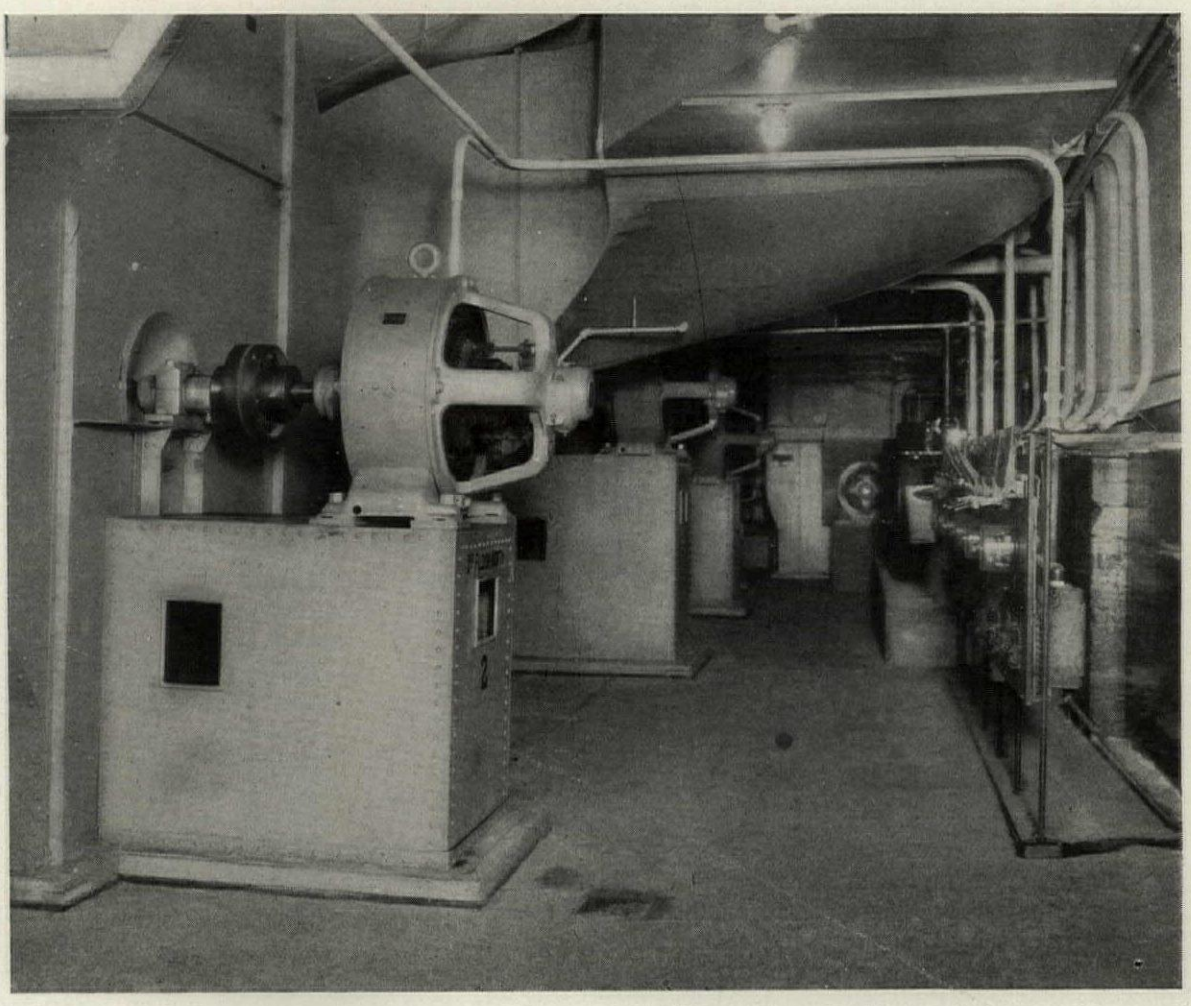
Starrett & Van Vleck, Architects; Hentz, Reid & Adler, Associated

to radiators are concealed. In this class of construction the concealed radiator branches should be of brass pipe, due to the fact that horizontal piping is more likely to corrode than vertical piping. The new tube type of radiation is used generally from 20 to 26 inches in height, depending on the height of the window sill. The arrangement of direct radiators is dependent largely

on the layout of the store fixtures. The fixture layout is generally different on each floor, and due consideration must be given to this in laying out the heating system. Usually the radiators placed under the windows will be in an alley between the outside walls and the backs of the fixtures. Care must be taken to see that the design of the fixtures is such that it will permit circulation of air over the radiators. The fixture layout is also a deciding factor in the control of the radiators. Thermostatic temperature control is strongly recommended from the standpoints of both economy and comfort. In open floor areas, the radiators are controlled in groups of three or four from one thermostat, generally located on columns along the wall. When radiators are behind the fixtures they are grouped in a similar manner, and the thermostats are, in turn, grouped under the control of a pilot thermostat located on a column in the open sales area, where the temperature is to be maintained. This is convenient.

Main Floor and Basement. The areas in the average store which require special attention are the main or street floor and the basement sales area. The main floor is usually entirely heated and ventilated by the forced blast system of circulated air, designed to operate successfully during both the winter and the summer. Direct radiation is used on the floor only in such places as service halls, stair landings, passageways, etc. Basement sales areas are entirely ventilated by means of a similar forced blast air system. There is little need of any direct heating surface in basements, generally, as the problem there is usually one of overcoming excessive heat even during the winter months. The air supply for the street floor is usually based on an air volume equal to six changes of the entire area per hour. The basement air supply is based on ten changes of air per hour, which will maintain comfortable conditions.

Air Supply. A properly located fresh air intake shaft from the roof to the fan room insures an air supply comparatively free of dust, but to further clean the incoming air, filters of the so-



A Portion of the Fan Room, Saks-Fifth Avenue, New York
Starrett & Van Vleck, Architects

called automatic type are installed in the intake to each fan unit. From the filters the air passes through tempering stacks with automatic temperature control, then through air washers, where the air, passing through a fine misty spray of water, heated to the required temperature, is washed and given the necessary moisture content to overcome a low relative humidity. Passing through the washer, the air is further heated by a re-heating stack to the temperature required to maintain the degree of comfort necessary in the area supplied. From the re-heating stacks, the supply fans discharge the air through a system of ducts distributing it evenly over the area.

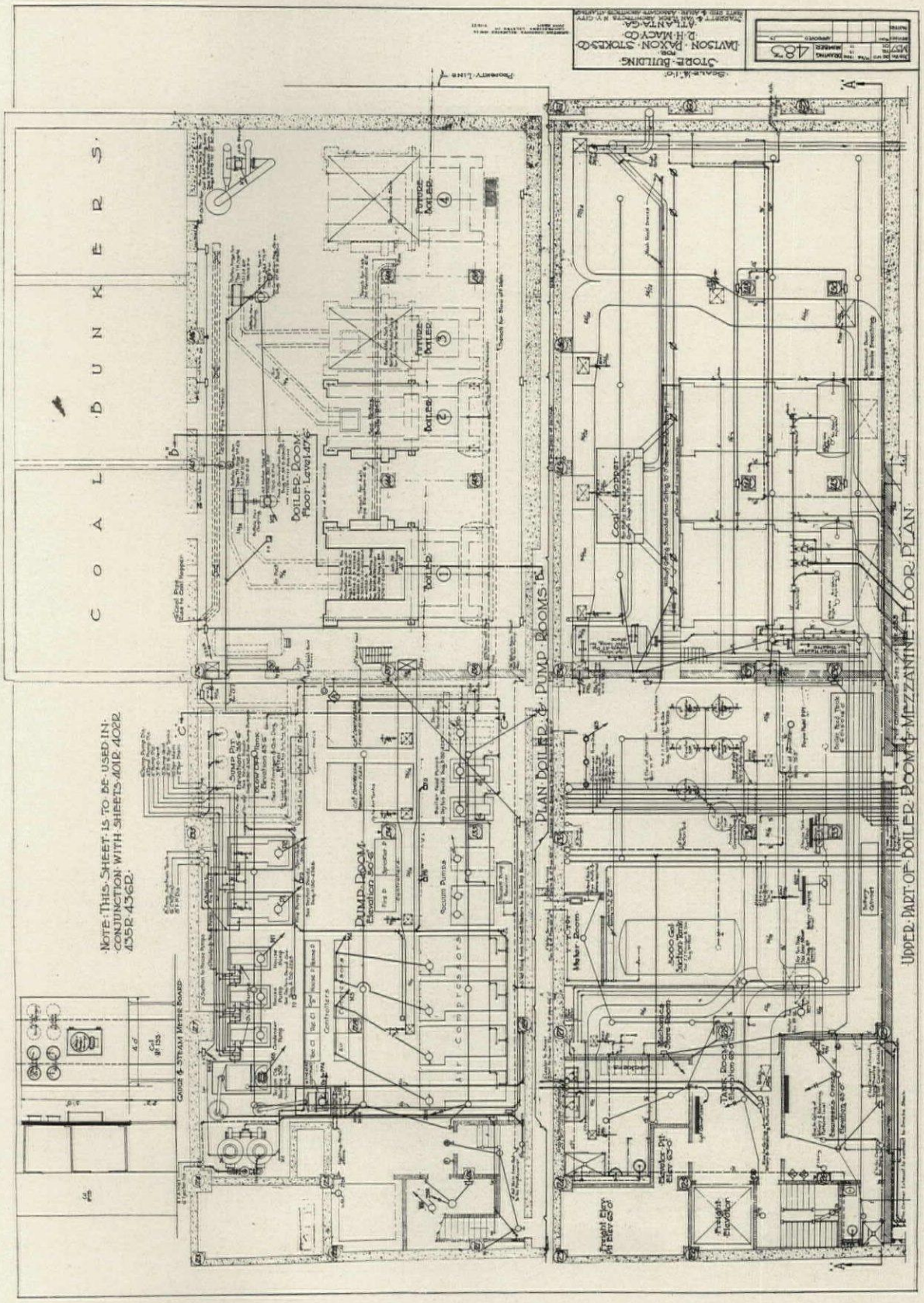
In street floor areas, the distributing ducts are usually run laterally in furred spaces above the show windows, discharging the air through grilles above the tops of fixtures back of the show windows. A variation of this method of distribution has the lateral duct run on top of the fixtures furred in to match, and grilles in panels. The present trend toward modernistic treatment, with recessed panels in the ceilings, permits the lateral ducts to be installed in the furred ceiling, discharge openings being continuous around the panels. In the basement area the most practical treatments of the supply ducts are to also run them in the furred ceiling, providing discharge outlets centered at the lighting fixtures. A sheet metal deflecting plate, hung approximately 8 inches below the ceiling, provides for the horizontal distribution of the incoming air, and it also provides a support for the lighting fixture. The introduction of air-conditioning systems for providing cooled air during the summer months necessitates use of this method of air supply to avoid the downward blasts of cold air.

The exhaust systems for both street floor and basement areas provide for drawing the air from the floor line generally through ducts built into the store fixtures at the columns. This exhaust air is carried through vertical shafts to exhaust fans in the roof and is then discharged to the atmosphere. This exhaust air is also by-passed and used to supply air to the boiler room, machinery rooms, and other areas where large volumes of circulating air are needed.

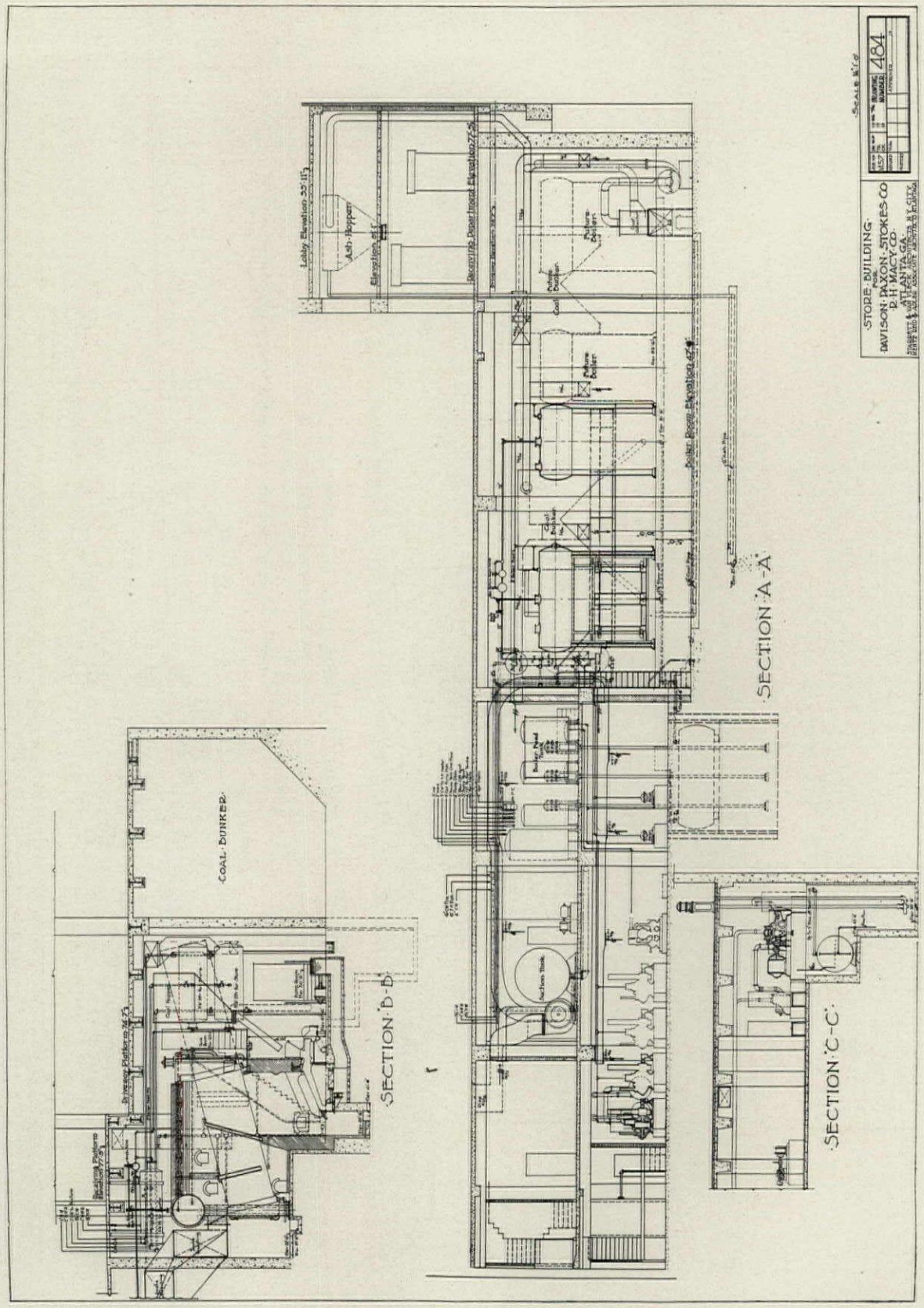
Air Conditioning in Summer. The supply and exhaust systems, as outlined, are primarily for use during the winter months. The same apparatus is used for conditioning the air during the summer. To accomplish this, only slight modifications are made in the systems outlined. To condition the air in the store during the most severe spell of high humidity and temperature, to the point where the temperature maintained in the sales area will be from 10° to 15° below that on the street, with a relative humidity of from 50 per cent to 55 per cent, is the most recent improvement in the ventilation of department stores. To condition the air, as outlined, the water sprayed through the air washer nozzles is cooled to the necessary temperature by means of a refrigerating plant. In the air-conditioning plant approximately 70 per cent of the exhaust air is returned to the supply fan units, there reconditioned and mixed with the makeup air of 30 per cent of the volume, and then returned to the sales area. The use of this large volume of re-circulated air is made necessary to keep the size of the refrigerating plant within practical bounds, and to keep the cost of the operation within the range of economy. In the use of a large volume of re-circulated air, it has been found to be advantageous to introduce ozone into the system at the point of discharge from the supply fans to overcome any possibility of odors being carried through and intensified.

Vestibules. The most vital points in the heating of the street floor area develop in the vestibules and the areas adjoining them in the store. The most practical and satisfactory method of treating these areas is to introduce large volumes of heated air into the vestibules through grilles under the show windows, or in the side walls. Each vestibule presents an individual problem, depending upon its size, arrangement, type of door, exposure, etc. Generally an air supply of from two to three times the volume of the vestibule per minute gives satisfactory results. This air is drawn from either the street floor or basement area, re-heated, and then blown into the vestibules. The temperature control for this air is regulated by thermostats adjacent to the entrance, inside, on the street floor.

Direct Radiation. Generally, throughout the store above the street floor, the building is heated with direct radiation. Each building presents its own problems. Areas devoted to beauty parlors, dining rooms, kitchens and special display rooms all present problems for individual treatment. Beauty parlors and dining rooms are areas that require air-conditioning systems similar to the street floor and basements. Kitchens, soda fountains and cafeterias require strong exhaust systems to avoid all possibility of odors penetrating into adjacent areas. The use of ozone in these areas is highly recommended as an agent for preventing objectionable odors. The air of the toilet rooms throughout the building is generally changed on an average of 20 times per hour. Exhaust ducts are usually run in pipe spaces back of compartments, with an individual exhaust grille at each compartment. All work spaces in the building are provided with exhaust ventilation. In areas such as general offices, where the occupants are likely to be congested, additional ventilation is sometimes required for their comfort.



PLAN OF BOILER AND PUMP ROOMS, DAVISON, PAXON CO. BUILDING, ATLANTA
STARRETT & VAN VLECK, ARCHITECTS; HENTZ, REID & ADLER, ASSOCIATED



SECTIONS THROUGH BOILER AND PUMP ROOMS, DAVISON, PAXON CO. BUILDING, ATLANTA

STARRETT & VAN VLECK, ARCHITECTS; HENTZ, REID & ADLER, ASSOCIATED

PLUMBING, SPRINKLER AND VACUUM CLEANING SYSTEMS

BY
HARRY H. BOND

PLUMBING and its associated equipment in the modern department store have grown, in recent years, to be important features, in a way similar to the advancement that has been made in the plumbing of the modern hospital. The plumbing installation is largely controlled by local plumbing codes, with which the engineer must comply. The plumbing pipes, which are of sufficient size, require special shafts, so that the engineer must also take into account the locations of these pipes in connection with the architectural features of the building. In its humble way, plumbing quietly provides "service" in the department store that is essential to the health and comfort of both the employes and the customers. Every architect realizes that it is necessary to have a sufficient number of toilet rooms scattered throughout the building to adequately serve the employes and customers, and he must consider the desirability of having outside windows in such rooms, the desirability of artificial ventilation, and the absolute necessity of providing mechanical ventilation in toilet rooms without windows. It is not desirable to install fixtures which may never be required, but it is even worse to have an insufficient number of fixtures. The number of occupants per fixture for men in department stores is often planned upon this basis:

Water Closets		Urinals	
Average	Maximum	Average	Maximum
100	200	250	300

Lavatories	
Average	Maximum
100	200

The number of occupants per fixture for women in department stores is:

Water Closets		Lavatories	
Average	Maximum	Average	Maximum
75	125	100	200

In arranging the plumbing fixtures in a toilet room, it has been found good practice to locate the water closets and urinals near the outside of the building, providing swinging doors with a 6-foot marble or metal partition separating the toilet compartments from the wash room which one enters from the store. Consideration should also be given to toilet room locations and their accessibility from all parts of the floor, so that they may be reached without walking a great distance. An economical arrangement would be to place the toilet rooms for each sex adjacent one to the other, so as to allow for the use of the same pipe and vent shafts. Care must be taken, however, to keep the doors as far apart as possible, and preferably out of sight of each other.

Toilet room arrangements are governed so largely by local conditions in the building that to suggest anything in the nature of a standard arrangement is almost impossible. Therefore, it is well to remember to put the fixtures requiring the most ventilation next to the outside windows; to keep the entrances to the toilet compartments protected from the view of passers-by; to keep the entrances for toilets accommodating opposite sexes out of sight of one another; and not to make the travel distances too great. If these suggestions are carried out, the main toilet room planning demands will have been met.

A slop-sink closet with a slop-sink is also an important feature to introduce closely adjacent, if not in the toilet rooms, and with either arrangement, the same plumbing risers may be used for both toilet rooms and slop-sink closets. Floor drains are generally installed in toilet rooms and have hose cocks placed at the end of the lavatory batteries in order to keep the water seals in the traps of the floor drains.

Wall-hung water closets, urinals, slop-sinks, lavatories and drinking fountains are the most desirable types of plumbing fixtures for the department store, since they permit ready access to all parts of the floor space in and around any toilet room. Flush valves are part of standard equipment for all urinals and water closets, with self-closing faucets for the lavatories. Metal faucets, flush valves and escutcheons are much more serviceable than china-handled faucets and china escutcheons. Soap-dispensing systems, fed from tanks with soap valves over each basin, are now an important detail in the modern department store toilet room. Mirrors with shelves beneath are an added convenience much appreciated by both customers and employes.

In many instances the basement and sub-basement floors of these stores have higher than the average building story heights. This, in turn, often leaves the level of the street sewers above the basement and sub-basement floors, and all plumbing fixtures on these floors have to discharge their sewage into ejector pots which, in turn, pump the sewage up to the street sewers. Sump pumps are also installed to take drips from pumps, tanks, boiler blow-offs, floor drains, etc., that are also below the level of the street sewers. This waste water is drained to a concrete sump pit generally located in the pump or machine room with vertical centrifugal pumps that will

start pumping automatically when the water in the pit reaches a certain level, and stop when the pit has been emptied.

With constant use of water in this type of building, and the pressure required for perfect operation of the plumbing fixtures, and instant demand, the use of water directly from the street mains is no longer recommended. Therefore, storage of water in either closed suction tanks or open suction tanks is, together with house tanks in the penthouses, the proper way of serving the plumbing requirements for the store. In case of break downs in the street water mains, tanks designed to hold a water capacity to suffice for several hours will serve the store during such a crisis. In order to transfer the water from the suction tanks to the house tanks, usually a distance of several stories, it is necessary to provide pumps, generally in duplicate and of equal capacity, that will convey a sufficient quantity of water to the house tanks to meet the maximum demand per minute. From the house tanks water is supplied to all plumbing fixtures requiring cold water, to the hot water heaters in the pump or boiler rooms, to the drinking water system, and also to the standpipe system.

Vacuum cleaning systems in department stores afford the owner an arrangement whereby the building may be thoroughly cleaned within a few hours. A stationary vacuum cleaning installation consists of pipe risers with the number of outlets on each floor so arranged that 50-foot lengths of hose attached to the risers will reach any part of the floor, wall, show cases or fixtures. Tools are furnished with an installation of this character, so that the vacuum cleaner can be used for rugs, walls, radiators, etc. The vacuum machine is located in the pump room, and connecting with the machine is the separator into which all dirt, dust, pins, etc., are collected. The separator is easily emptied, and the contents are burned in the incinerator or otherwise disposed of.

The sprinkler system layout for the department store of today is important, particularly because the design must meet with the approval of the local fire prevention bureau, the National Fire Insurance Exchange, the local insurance exchanges, the owner, and last but not least, the approval of the architect. Interference with ventilating ducts, electric conduits, lighting fixtures and steel members must be avoided, and still the system, when installed, must be symmetrical and afford the owners 100 per cent sprinkler protection. Penalties in the form of higher insurance rates will be incurred if the system is not properly designed and installed.

Where the appropriation permits, the neatest ceiling for a department store will be obtained when the entire sprinkler installation with the risers, valves, mains, branches and laterals, is concealed. Such a ceiling will have only the sprinkler heads exposed, evenly spaced with column centers, panels and the lighting fixtures. In some buildings this ceiling scheme is carried throughout, though in others it is applied only in the selling areas, and the sprinkler system is run exposed in the utility spaces. Where the resources of the department store do not warrant installing a concealed sprinkler system, the mains, branches and laterals are all run exposed, and the sprinkler heads are, as usual, evenly spaced with column centers, panels, lighting fixtures, etc. Where the sprinkler system is concealed, a more decorative ceiling can be obtained, and if the sprinkler heads are objectionable, they can often be incorporated in the ceiling design, whether it be elaborate Tudor or simple "modern."

The water supply to the sprinkler system comes from either gravity tanks or pressure tanks, located on the roof or in penthouses. In some instances, a combination of gravity and pressure tanks is used. The gravity system of tanks must have twice as much water as a pressure tank system, as the latter is kept under a pressure of 85 pounds at all times. The amount of water used is based on the total number of sprinkler heads in the average area, times 20 gallons per minute for 20 minutes, times 25 per cent for gravity systems, and times 12½ per cent for the pressure systems. Siamese connections must also be provided on the sprinkler system at each street front.

Where sprinkler heads are so located that they may be subject to corrosion, they must be protected with a coating to make them non-corrosive, and where they are subjected to a higher than average temperature, they must be set to discharge at a higher temperature. Sprinkler heads in show windows must be run from what is known as a "dry" valve on a dry system which contains air under pressure in the lines. When the heads go off in a show window, due to a fire, they release the air in the piping system which, in turn, releases an equalizer in the dry valve, and the water then follows the air to the opened sprinkler heads. The actual time for this operation is in seconds, and it has proved its worth in the few show window fires which have occurred.

A MODERN STORE ALTERATION

BY

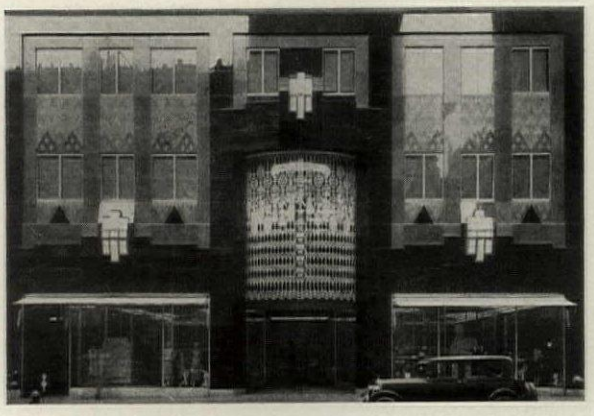
ARTHUR T. NORTH

THE fickle nature of fashion with its constant and rapid changes has caused a great expansion of the allied industries and commerce with attendant transformations in merchandising methods,—all of which is manifested in the evolution of the store and shop. In the days of drab fashions, the store and shop were equally as uninteresting. The housing was in harmony with the merchandise. The universal demand for the beautiful, the causes of which do not concern us at this time, has been expressed in beautiful merchandise of every kind which requires equally attractive surroundings for its display and sale. With suitable facilities for display there must be adequate provision for inspection and purchase, which necessitates ample space for the circulation of purchasers.

The primary requisite for merchandising is external display to the passer-by,—the potential purchaser. This is had through the medium of show windows. After the attention of the passer-by is attracted to the show window, it is essential to provide conditions which will permit that undisturbed and comfortable inspection which is inducive to purchasing. The congestion of sidewalks by hurrying crowds or hot or inclement weather militates against the ideal condition which is prerequisite to purchasing. To overcome this objection to show window inspection of merchandise, a form of display vestibule has been devised. A recent and most effective construction of this kind is found in the store of The Bedell Company, New York, illustrated on this page. Apparently this feature is considered so important that approximately one third of the first floor of the store area is given over to the display vestibule on the 34th Street front. This display vestibule occupies the entire width of the store.

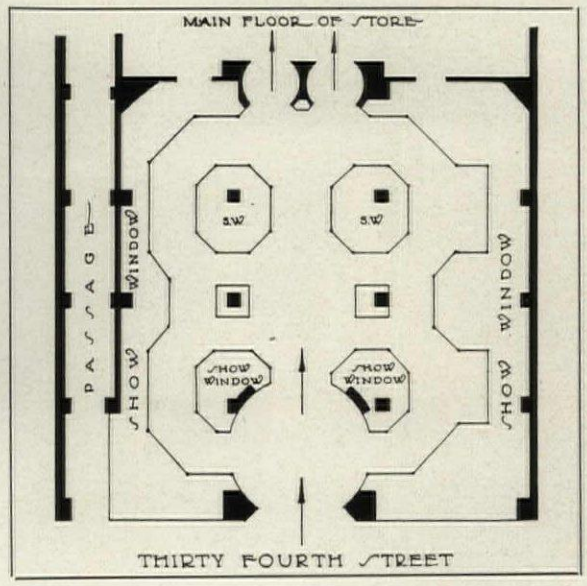
Large and very attractive show windows are placed on each side of a central, two-story entrance. Between this entrance to the display vestibule and the entrance to the store proper there is a large space which is entirely glass-enclosed. The exterior show windows are glass-enclosed on both sides. Show windows are placed along the side walls of the vestibule and along the front of the store proper. These show windows are very deep and permit the display of merchandise without crowding, giving also spaciousness that is befitting the display of beautiful merchandise. The display vestibule is brilliantly illuminated.

The alterations in this store building have corresponded with its improvements in merchandising methods and with the continuous increase in its volume of business. The first alteration of the show windows and store entrance included the removal of two first-story columns and the erection of a heavy plate girder, extending entirely across the front, to support the columns above. The girder loads were transferred to their original foundations through a load-distributing truss erected in the basement (Figs. 1 and 2). The store was widened recently by including the property adjoining on the east, and the principal feature of the recently altered front consists of a two-story entrance built in the center of the widened store and the complete rebuilding of the show windows. Equally as extensive alterations

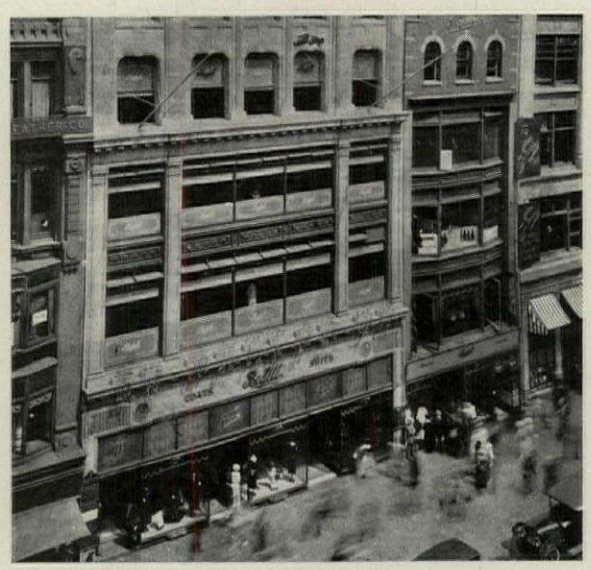


Above. New Front of the Bedell Store, New York

Designed by Joseph Urban, Architect
George A. Schonewald, Architect of the Building Alteration



Right. Plan of the shop front, showing unusual arrangement and extent of show windows. The Bedell Store, New York



Bedell Store, New York, before Latest Alteration. The Building at the Right is Incorporated in the New Store

George A. Schonewald, Architect for the alteration
Joseph Urban, Designer of Shop Front

were made in the structural frame, in the display vestibule, and in the removal of the party walls between the two properties. The successive stages of rebuilding the structural frame of the front are indicated in the diagrams upon this page.

The architectural transformation of this store in its various stages illustrates the ability of the structural engineer to perform the "structural surgery," if one pleases, to make it possible to execute the architectural design regardless of its form and at the same time retain the stability of the structure. George A. Schonewald was the architect for the building alterations; Joseph Urban designed the shop front, and Elwyn E. Seelye was structural engineer for the operation.

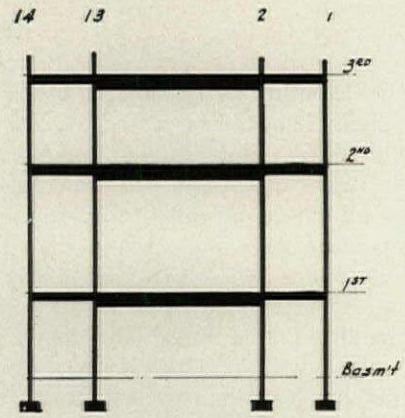


Fig. 1. The original structural steel frame

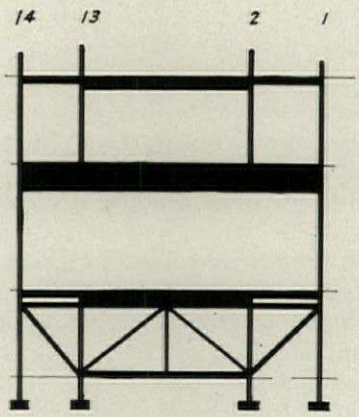


Fig. 2. The large girder and the inverted truss were necessary to accommodate the wide show front shown at the upper left corner of this page

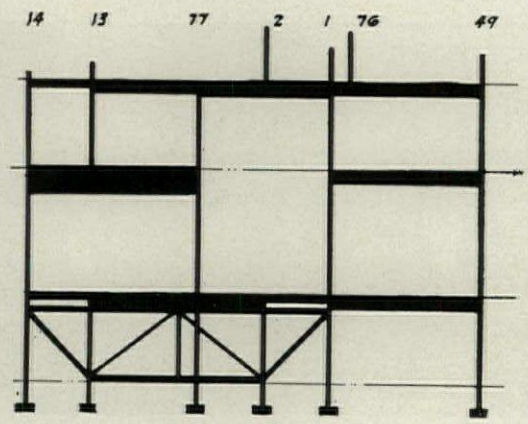


Fig. 3. The alterations in the structural frame shown here were to accommodate the new shop front shown on the preceding page

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

The distinctive Kohler enameled iron Belmore lavatory gracefully complements the Viceroy recess bath

The importance of COLORED FIXTURES *in the bathroom*

COLORED fixtures are daily assuming greater importance in the building scheme. And it is safe to assume that their importance will continue to grow.

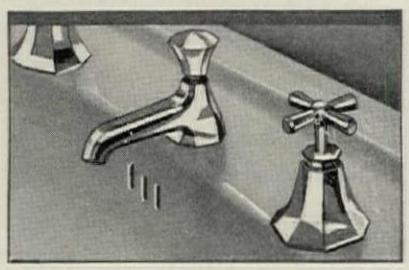
At the present moment it is strikingly apparent that the beautiful Kohler colored fixtures have much more than their beauty to recommend them. They have a newness *which is of great value to the client who is building to sell or rent.*

Instances are multiplying to show how Kohler colored fixtures attract buyers or tenants. Builders of apartments and hotels are gaining marked advantage by installing these fixtures. Architects, accordingly, are examining with increasing interest the possibilities of this ware.

The Kohler colors are delicate, restrained, lending themselves to the creation of tasteful effects of enduring charm. Their variety permits the development of a practically limitless range of attractive color schemes — and affords a most stimulating opportunity to the architect.

We especially invite you to examine Kohler colored fixtures at a Kohler display room. And we shall be glad to send you the new book described in the coupon.

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



The completing touch—Kohler "Octachrome" fittings in chromium plate

KOHLER OF KOHLER
PLUMBING FIXTURES

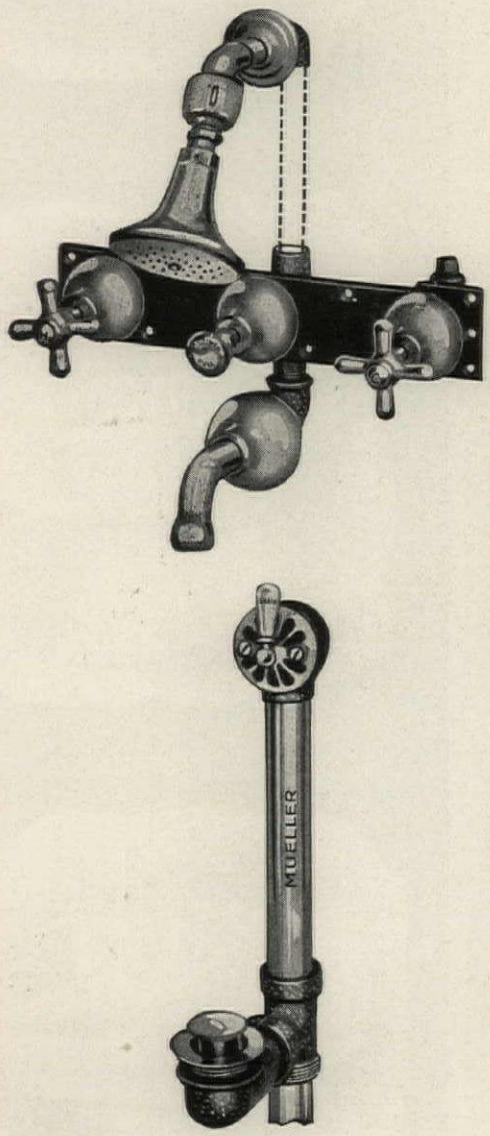
LOOK FOR THE KOHLER TRADE MARK ON EACH FIXTURE

New
72-PAGE BOOK
FREE
Please mail to
Kohler Co., Kohler, Wis., *for*
A helpful book for the architect. Illustrated in color. Shows bathrooms, kitchens, laundries; color schemes; floor plans; prices.

Name.....
Street.....
City.....*State*.....

 AF 6-29

No more surprise showers *with* Mueller Automatic Diverter Valve



A NEW Mueller feature especially desirable for hotel and apartment tub and shower installations.

The MUELLER *Automatic Diverter Valve* eliminates all danger of an unexpected shower for anyone not familiar with the operation of the fitting. It assures of the flow remaining diverted to the tub when the side or control valves have been shut off.

Four styles to choose from—send for complete information on this new improved Mueller quality fitting.

MUELLER CO. (Established 1857) Decatur, Illinois. World's Largest Manufacturers of Plumbing Brass Goods. *Branches:* New York, Dallas, San Francisco, Los Angeles.

Canadian Factory: MUELLER, Limited, Sarnia.

MUELLER

PLUMBING BRASS AND VITREOUS WARE

If I were an Architect

By
Mrs. Marion Holloway

I WOULD review every detail in designing a home, from the standpoint of convenience to women. I would remind myself continually that homes are "lived in" most of all by women; that many appointments of the home continue to ignore the needs of the modern woman.

I would remember that women are shoppers — that one additional household convenience often decides a woman in her choice of an apartment or home. Now there is a modern water closet that is decidedly superior from a woman's point of view.

Countless women have come to know the Improved Madera as the one toilet that really passes a sanitary pad "as easily as a piece of tissue"... that ends forever the fear of embarrassment of stopped-up toilets. Specially built to provide for this sanitary problem, it has an *extra* large trapway, and powerful twin-jet siphon flushing.

I would specify the Improved Madera — if I were an architect — not only because the millions of women who are reading about it in national magazines will instantly recognize this superior appointment, but because it is thoroughly modern and a counterpart of beautiful bathrooms.

It is properly quiet. The beautiful Durock body is easy to keep clean. It is hygienically designed . . . long bowl and long comfortable seat. And it is available in white, solid tints and colors, and Blentone colors, to harmonize with any bathroom interior. Thos. Maddock's Sons Co., Trenton, N. J.

The High School at Oyster Bay, L. I., piped with Youngstown steel pipe in both plumbing and heating systems

Architects—**TOOKER & MARSH** *Plumbing Contractor*—**JOSEPH D. DUFFY**
Heating Contractor—**JOHN E. CURLEY**

Come where Steel is *Lived*

WHEN you are in need of information on any problem relating to the selection of pipe, conduit or sheet steel, let The Youngstown Sheet and Tube Company's staff help you. Each district sales office is manned by experts in steel and familiar with problems similar to yours.

THE YOUNGSTOWN SHEET & TUBE COMPANY

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

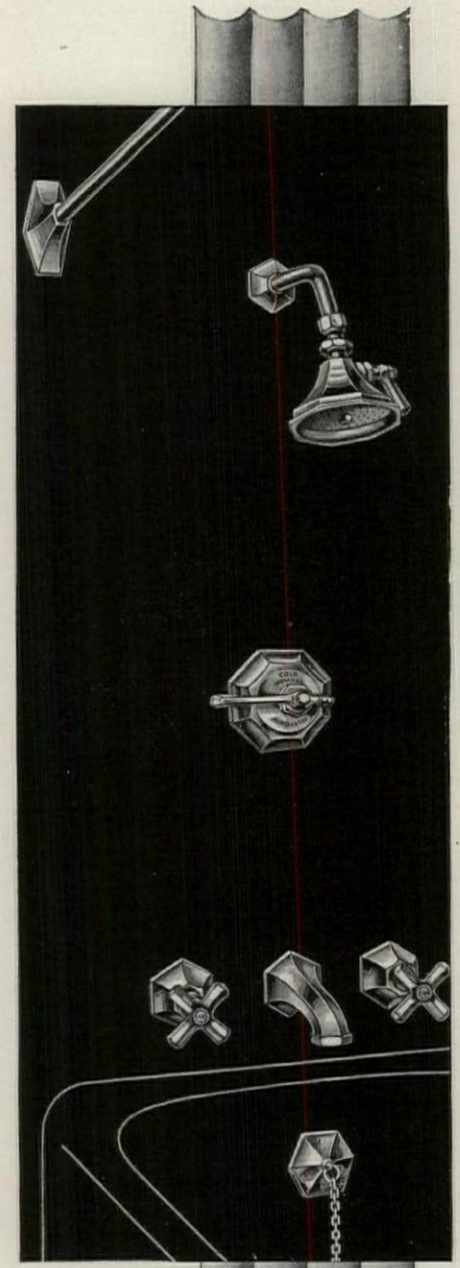
General Offices: YOUNGSTOWN, OHIO

DISTRICT SALES OFFICES:

ATLANTA—Healey Bldg.
BOSTON—80 Federal St.
BUFFALO—Liberty Bank Bldg.
CHICAGO—Conway Bldg.
CINCINNATI—Union Trust Bldg.
CLEVELAND—Union Trust Bldg.
DALLAS—Magnolia Bldg.
DENVER—Continental Oil Bldg.
DETROIT—Fisher Bldg.
KANSAS CITY, MO.—Commerce Bldg.
MINNEAPOLIS—Andrus Bldg.
NEW ORLEANS—Hibernia Bldg.
NEW YORK—30 Church St.
PHILADELPHIA—Franklin Trust Bldg.
PITTSBURGH—Oliver Bldg.
SAVANNAH—M and M T Terminals
SAN FRANCISCO—55 New Montgomery St.
SEATTLE—Central Bldg.
ST. LOUIS—Shell Bldg., 13th and Locust Sts.
YOUNGSTOWN—Stambaugh Bldg.

LONDON REPRESENTATIVE—The Youngstown Steel Products Co., Dashwood House, Old Broad St., London, E. C. England

YOUNGSTOWN



ensemble

. . . new glorification for the American bathroom .

EFFECTIVE ensemble . . . the dominating rule of fashion by which women select their apparel, is the same rule that is guiding their selection of appointments for the home.

Ensemble of color in the bathroom . . . ensemble of bathroom appointments . . . and the final brilliant touch, the perfect ensemble of the silvery metal fixtures.

Speakman's beautiful Artline fixtures in sparkling chromium plate for shower, lavatory and tub (kitchen sinks, also) are not only supreme in their grace and brilliance but *are perfectly and harmoniously matched.* The same distinguished design is carried throughout the group.

For the brilliant ensemble, no more jewel-like, exquisite fixtures than the Speakman Artline can be found today. SPEAKMAN COMPANY, Wilmington, Del.

SPEAKMAN
SHOWERS & FIXTURES

CRODON

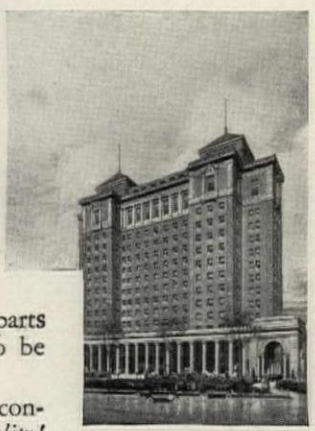
TRADE MARK REG. U. S. PAT. OFF.

THE CHROME PLATE

. . . some evidence of its increasing popularity

Master Builder's Apartment Hotel, New York. Sugarman & Berger, Architects.

Kehya Realty Corp. Building, 100 East 42nd Street, New York



Battle Creek Sanitarium. M. J. Morehouse, Architect, Chicago.

TO specify "All exposed metal parts in Chromium" is getting to be standard practice.

And where Chromium Plating is concerned CRODON stands for *quality!*

In the buildings shown on this page, the permanent brilliance of Crodon Chromium Plate shines from Bath Rooms, Toilet Rooms, and Kitchens.

The fittings in the restaurant in the 100 East 42 Street building are Chromium Plated for wearing quality—and because Chromium plate lends itself to modern decoration!

It will be a pleasure to send you names of manufacturers licensed to use the CRODON process—which means *Chromium plate on which Architects and Builders may depend implicitly!*

262 Park Avenue, New York. Sugarman & Berger, Architects, New York.

Zouri Drawn Metals Company, Chicago, are making a specialty of Store Fronts in Chromium.

CRODON

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

THE CHROME PLATE

Chromium Corporation of America, 120 Broadway, New York, *Licensees of*

UNITED CHROMIUM

INCORPORATED

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

Branch Office and Plants: 4645 W. Chicago Ave., Chicago · 114 Sansome St., San Francisco · 3220 Bellevue Ave., Detroit · 3125 Perkins Ave., Cleveland · Waterbury, Conn.

Paris STYLES

decree this new-type heating system

CLOTHES that women wear today do not afford the warmth that men's attire does. It is natural that the uniformly heated home is no longer satisfactory to an entire family.

Paris styles decree the modern heating system that delivers locally to each room as much or as little heat as is required, with no effect on the temperature of other rooms.

With Hoffman Controlled Heat, a touch of the finger on the lever handle of each room's radiator valve commands the radiator to give off full heat, three-quarters heat, half heat, quarter heat or none at all. This system automatically adjusts itself to the hour-to-hour need for heat. Only as the call for heat increases, does the supply of steam accumulate.

Hoffman Controlled Heat requires only a few ounces of pressure to heat large private homes, one pound to heat large buildings, in zero weather. Close comparative check-ups on fuel costs prove drastic savings.

With any standard boiler and radiators, whether fired by coal, oil or gas, it is easy to add the equipment that makes it a Hoffman Controlled Heat system. This equipment places precise controls over boiler and radiators at every point necessary to assure automatic and amazingly safe and flexible operation.

With every Hoffman Controlled Heat installation goes the written guarantee of a long-established, conscientious maker, of perfect operation for years. The Hoffman Specialty Company also offers expert engineering counsel.

Many architects have expressed keen interest in the Hoffman booklet describing in detail the operation of Hoffman Controlled Heat. You are cordially invited to write for a copy. Address Hoffman Specialty Company, Inc., Dept., EF-6, Waterbury, Connecticut. No obligation.

HOFFMAN CONTROLLED HEAT

Design by James B. Clow & Sons, patents pending

The New Clow HOSPAN Closet

In hospitals equipped with Clow Hospan closets, a very unpleasant duty of the nurses is made easier. With Hospan closets installed in every patient's room or ward bathroom, carrying bed pans through halls to distant cleansing rooms is avoided.

Besides, the Hospan serves all the usual purposes of a closet, with all the usual dependability that makes Clow closets so suited for rigorous hospital work.

Showing ledges for resting bed pan —and outlet for cleansing jet

Furthermore, the Clow Hospan closet is designed so that splashing on floors and attendant's clothing is absolutely avoided.

This practical fixture is just one of a long line of Clow special hospital equipment.

JAMES B. CLOW & SONS
201-299 N. Talman Ave., Chicago
Sales Offices in principal cities

CLOW

PREFERRED FOR EXACTING PLUMBING SINCE 1878

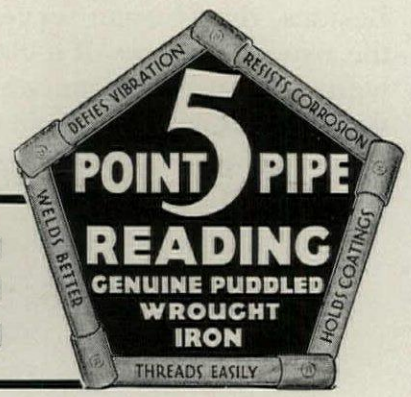
SAY good-bye to Reading 5-Point Pipe when it is installed—you'll probably never see it again during your life or the life of the building!

Once in, Reading 5-Point Pipe is in to stay. This pipe is made of Genuine Puddled Wrought Iron, and Genuine Puddled Wrought Iron has proved, time after time, that it will last for generations! Filaments of rust-defying silicious slag are distributed uniformly throughout the structure of the metal by the puddling process. And Reading 5-Point Pipe makes leak-proof joints because it threads so sharply and easily.

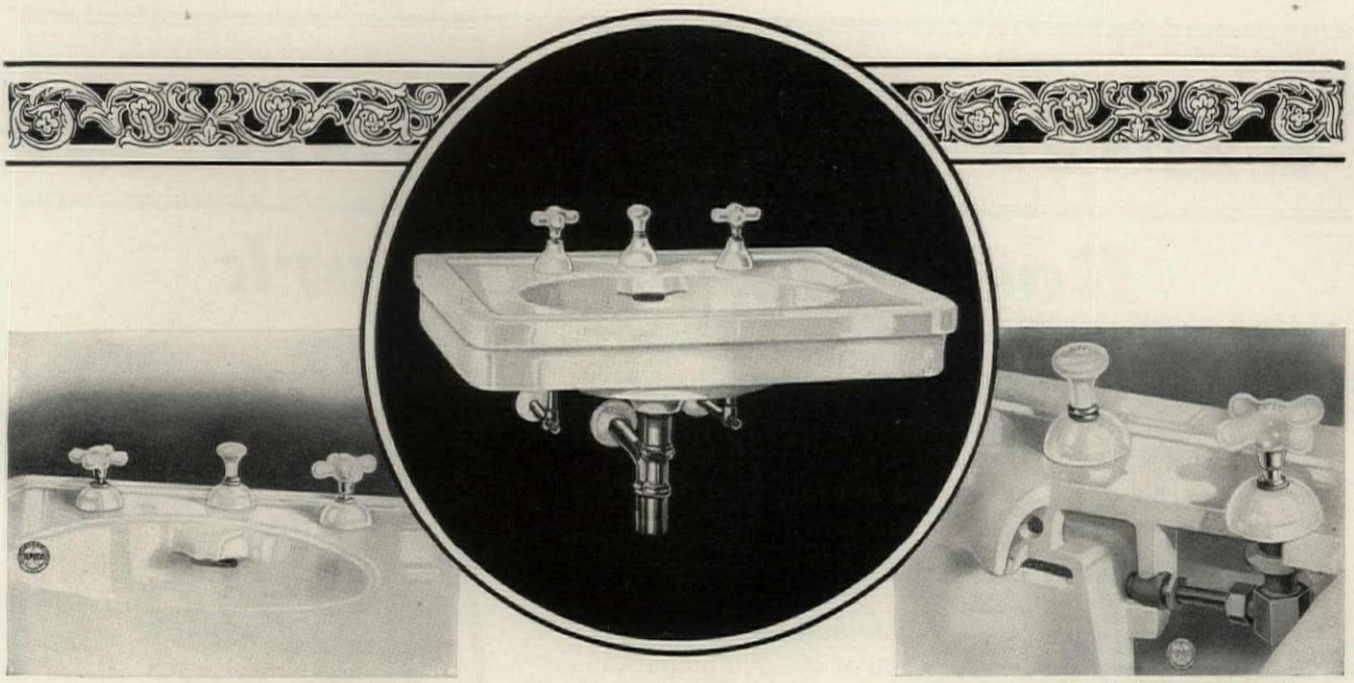
At a moderate price, Reading 5-Point Pipe gives proved protection. The name "Reading" is your guarantee.

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



The "Te-pe-co" Integral China Mixing Chamber with the Single-stream Integral Nozzle eliminates exposed metal above the slab.

The water enters from both sides of the overflow into the Te-pe-co Integral China Mixing Chamber before discharging through the Integral Nozzle.

TE-PE-CO

Integral Supply Lavatory

THE Te-pe-co Integral China Mixing Chamber with Single-stream Integral Nozzle is the most sanitary supply fixture that can be furnished. It makes it possible to wash in running water thoroughly tempered in the mixing. This Integral China Mixing Chamber is exclusively Te-pe-co. It is what makes our integral nozzle lavatory superior to others, since its construction checks the flow of water and thoroughly mixes hot and cold. The result is a splashless stream of water of ample volume and properly tempered.

Many of our country's finest hotels and other buildings have installed this type of Te-pe-co Lavatory along with our other All-Clay Plumbing Fixtures. Every natural, mechanical, chemical and financial resource available is utilized to build one unvarying quality—the best—into this Te-pe-co Ware.

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.

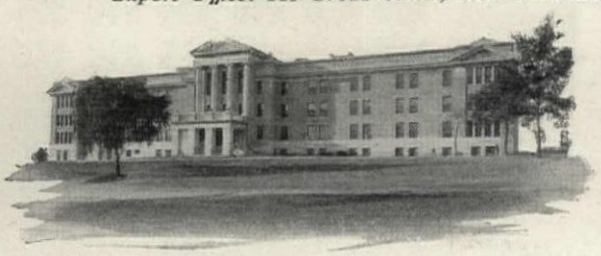
THE TRENTON POTTERIES COMPANY
Trenton, New Jersey, U.S.A.

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

Branch Offices
Boston, Philadelphia, Chicago

Export Office: 115 Broad Street, New York City

Warwick Apt. Hotel
Philadelphia
Frank E. Hahn, Archt.



Rickley Memorial Hospital
Springfield, Ohio
Langdon-Hohly & Cram. Archts.

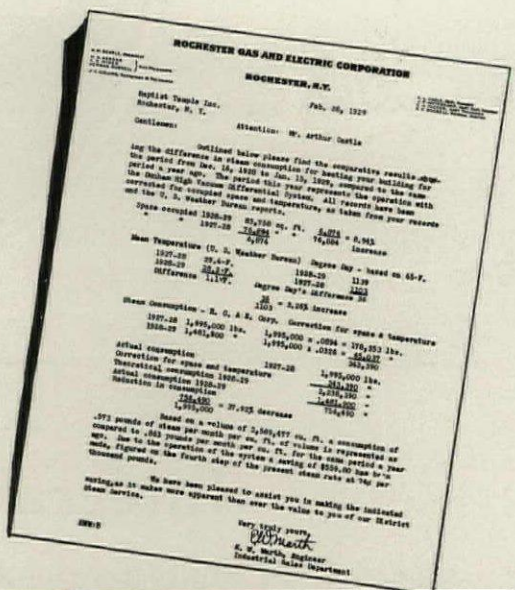
Drake Hotel
Chicago. Ill.
Marshall & Fox, Archts.

TEMPLE BUILDING

Rochester, New York

Did it pay the Baptist Temple, Inc., to change over the heating system in the Temple Building, Rochester, N. Y., from a vacuum return line system to a Dunham Differential Vacuum Heating System? The affirmative answer to this question is found in the record of the system's operation for the period from December 16, 1928, to January 15, 1929, as compared with the same period of the preceding year.

This record, reproduced in facsimile, shows a reduction in the steam consumption of 756,490 pounds, a saving for the period of $559.80, or 37.92% decrease. The report regarding this reduced steam consumption is made by the Rochester Gas and Electric Corporation, from whom the steam was bought, and is therefore of special interest.



ROCHESTER GAS AND ELECTRIC CORPORATION

ROCHESTER, N.Y.

Baptist Temple Inc.
Rochester, N. Y.

Feb. 26, 1929

Gentlemen:

Attention: Mr. Arthur Castle

Outlined below please find the comparative results showing the difference in steam consumption for heating your building for the period from Dec. 16, 1928 to Jan. 15, 1929, compared to the same period a year ago. The period this year represents to the same the Dunham High Vacuum Differential System. All records have been corrected for occupied space and temperature, as taken from your records and the U. S. Weather Bureau reports.

Space occupied 1928-29 85,730 cu. ft. 5,974 = 8.943 increase
" 1927-28 79,756 " " 70,084 "
5,974

Mean Temperature (U. S. Weather Bureau) Degree Day - based on 65-F.
1927-28 29.4-F. 1928-29 1139
1928-29 32.1-F. 1927-28 1243
Difference 1.1-F. Degree Day's difference 38
38
1243 = 3.06% increase

Steam Consumption - R. G. & E. Corp. Correction for space & temperature
1927-28 1,995,000 lbs. 1,995,000 x .0894 = 178,353 lbs.
1928-29 1,481,800 " 1,995,000 x .0335 = 66,832 "
245,185

Actual consumption 1927-28 1,995,000 lbs.
Correction for space and temperature 245,185 "
Theoretical consumption 1928-29 1,749,815 "
Actual consumption 1928-29 1,481,800 "
Reduction in Consumption 268,015 "
245,185
1,995,000 = 37.92% decrease

Based on a volume of 2,589,477 cu. ft., a consumption of .573 pounds of steam per month per cu. ft. of volume is represented as compared to .853 pounds per month per cu. ft. of volume in corresponding months. Due to the operation of the system a saving of $559.80 has been made. Figured on the fourth step of the present steam rate at 74¢ per thousand pounds.

We have been pleased to assist you in making the indicated saving, as it makes more apparent than ever the value to you of our District Steam Service.

Very truly yours,
W. W. Smith
E. W. Smith, Engineer
Industrial Sales Department

EWS:S

The Dunham Differential Vacuum Heating System

Gordon & Kaelber and Carl R. Traver, *Associated Architects*

Bareham & McFarland *Heating Contractors*

C. A. DUNHAM CO.

DUNHAM BUILDING

450 East Ohio Street, Chicago

Look for the name DUNHAM

This nameplate identifies a genuine DUNHAM Thermostatic Radiator Trap

U. S. Patent No. 1644114. Additional patents in the United States, Canada and Foreign Countries now pending.

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 Beauty of the new Reynolds Building is more than stone deep

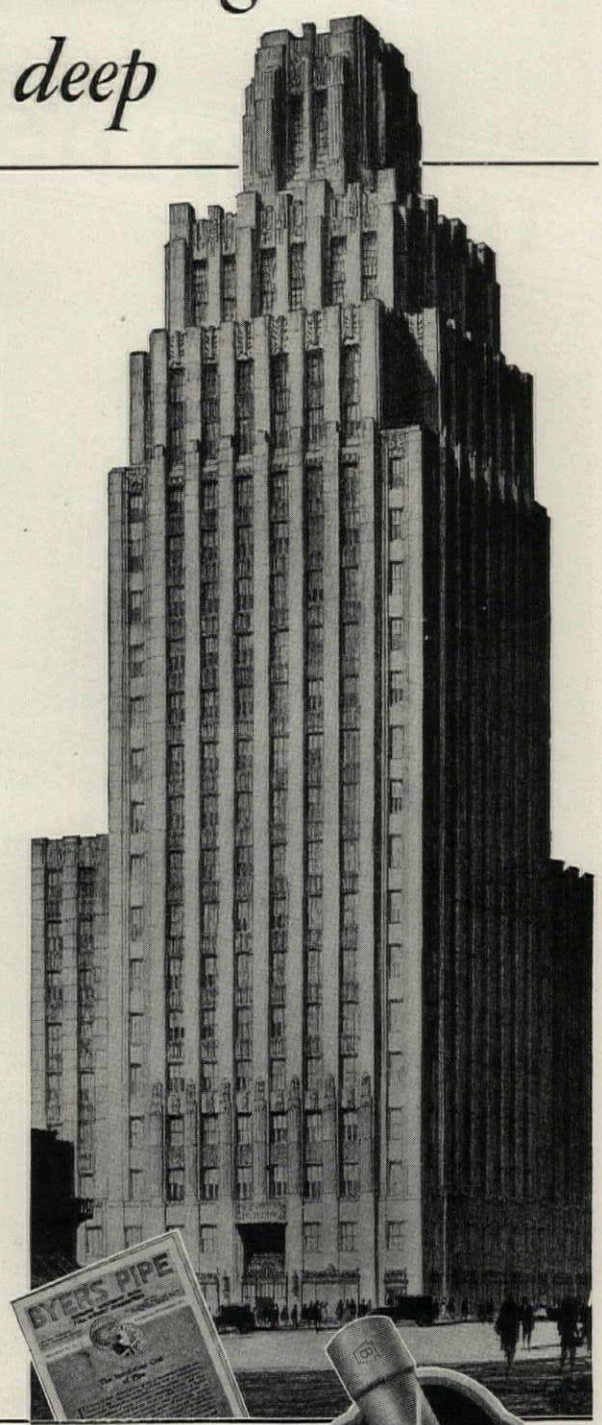
GOOD proportions, a surface of excellent limestone, a rich and handsome bronze doorway, lobbies and corridors of marble, and whatever else helps to give the Reynolds Building a look of character, would not make it in fact a good building. All these might be as fine as they are and yet the frame and substance of a really good building might be absent. What makes it likely that the Reynolds Building will be an ornament to Winston-Salem for many a year to come, is that it is well constructed of good materials.

Byers Pipe was on the specification list of the Reynolds Building, just completed at a cost of two million dollars. Byers was used for all cold water supply lines, fire lines, vent lines, and down spouting, and for other incidental purposes.

Extraordinary resistance to corrosion at reasonable cost is commending Byers Pipe to architects and engineers more and more. It is necessarily sold at a higher price than steel; but the difference is trifling when applied to the whole cost of a pipe installation. In the average case, wrought iron piping costs about 5% more.

The Reynolds Building was designed by Shreve and Lamb of New York, architects, the consulting engineers being Thomas J. Ashe and Warren W. Chapin, both of New York. The plumbing contractors were Riggs, Distler & Co. of Baltimore, and the plumbing supply house the Atlas Supply Company of Winston-Salem.

A. M. BYERS COMPANY
Established 1864 Pittsburgh, Pa.



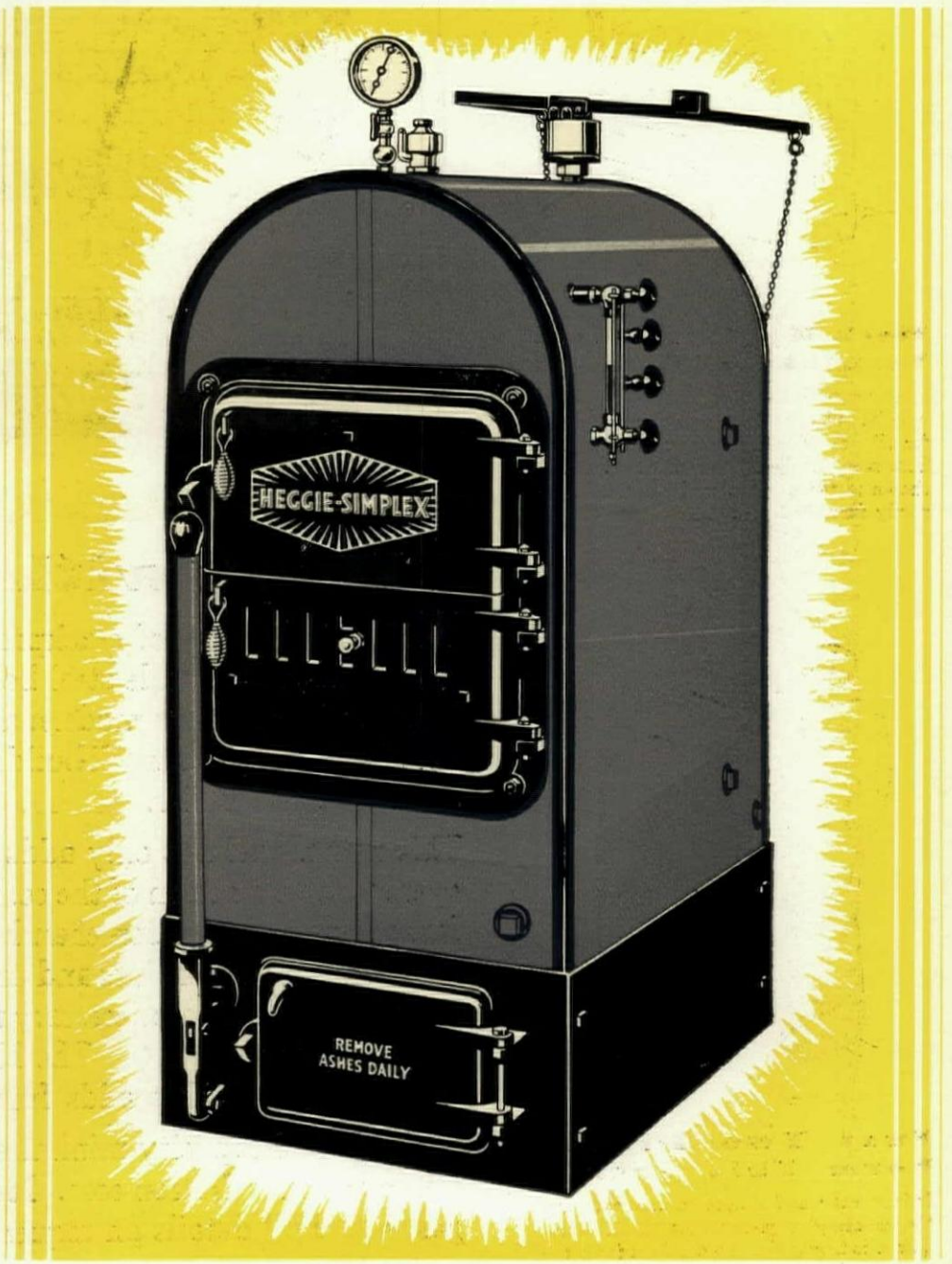
BYERS PIPE
GENUINE WROUGHT IRON

Write for Bulletin No. 38
It is a complete cost analysis of a large variety of pipe systems and dispels the fallacy that genuine wrought iron pipe is too costly to use. A copy will be mailed gladly on request.

HEGGIE-SIMPLEX PRESENTS the FIRST *JACKETED* STEEL BOILER

NOT just another jacketed boiler! This new Heggie-Simplex unit is, first of all, of crackproof *steel* construction; designed to produce heat at an unprecedented low cost.

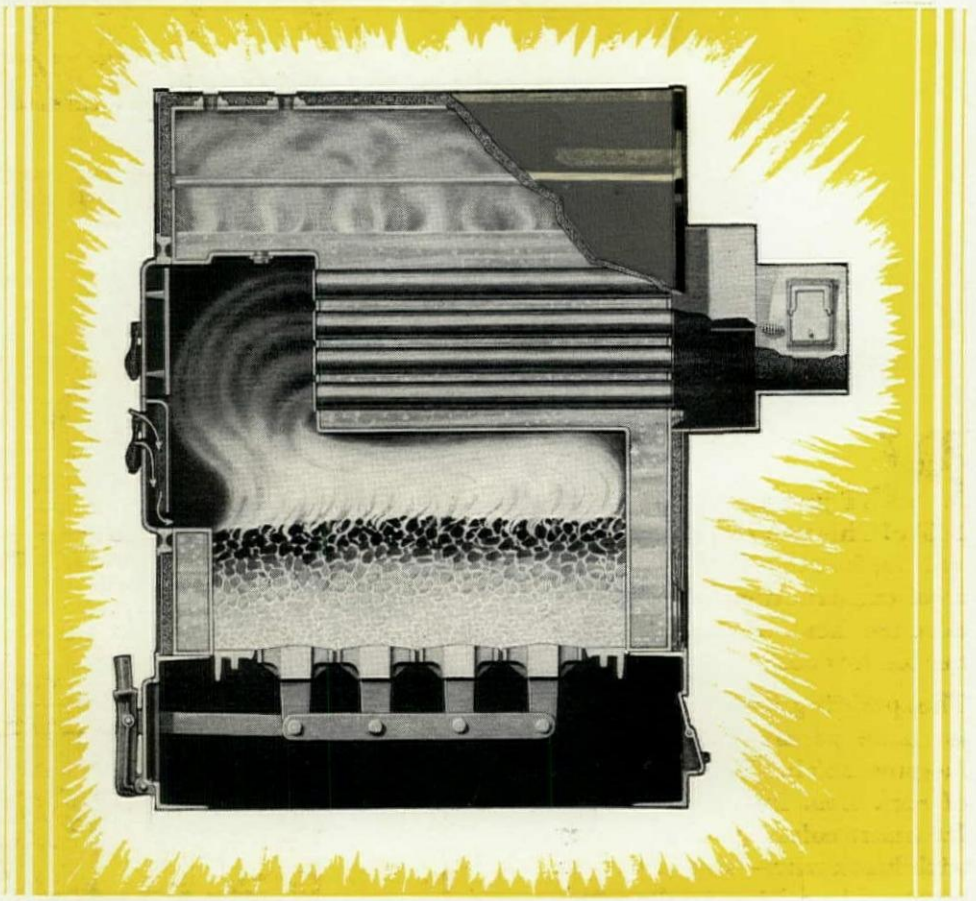
The sparkling beauty of its jacket is made permanent by tough lacquer finish. Thick blankets of *rock wool* insulate all sides. Its smart coloring—French grey with black trim—is what women want. They like its dignified, unobtrusive beauty, and practical value in not showing dust. At a recent exhibit, attended by thousands, this boiler was displayed in a variety of colors, including those usually used on jacketed boilers. When asked their preference, 92% chose this French grey and black.



92% Chose this Grey

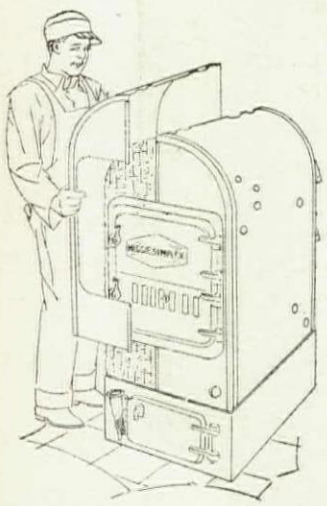
Adding the Beauty of Modern Coloring to the Permanence of Steel

A New Standard in Residence Boilers



Rock Wool Blankets Insulate ALL Sides

Ready-cut blankets of Rock Wool that only have to be laid in place, are supplied for *all* sides of this Heggie-Simplex Boiler. This material the Bureau of Standards has shown is twice as valuable as that ordinarily furnished with jackets.



Just Two Pieces Form This Jacket

It is so easy and simple to assemble this Heggie-Simplex jacket that the time required is negligible. Two halves form the entire jacket, clamping together without screws or bolts.

Heat without waste

THE permanence of crackproof construction and high efficiency that have made steel boilers the accepted standard in large buildings, plus modern artistic beauty, now are available for houses and small buildings in the new Heggie-Simplex *Jacketed* Steel Boiler.

This new model not only adds color to the basement, but it operates at a fraction of the cost of ordinary residence boilers. Its spacious combustion chamber, large amount of direct heating surface, tubular flues and unrestricted circulation of water provide the essentials necessary to burn *all* of the fuel and utilize its heat without waste. The blanket of *rock wool* insulation that lines the jacket adds further to the boiler's economy.

Its large fuel capacity minimizes care. Its unit construction minimizes installation cost. It is adaptable to any fuel—coal, gas, oil. Full details on request.

Heggie-Simplex Boiler Company, Joliet, Illinois. Representatives in principal cities—telephone and address listed under "Heggie-Simplex Boilers."

HEGGIE-SIMPLEX

STEEL HEATING BOILERS

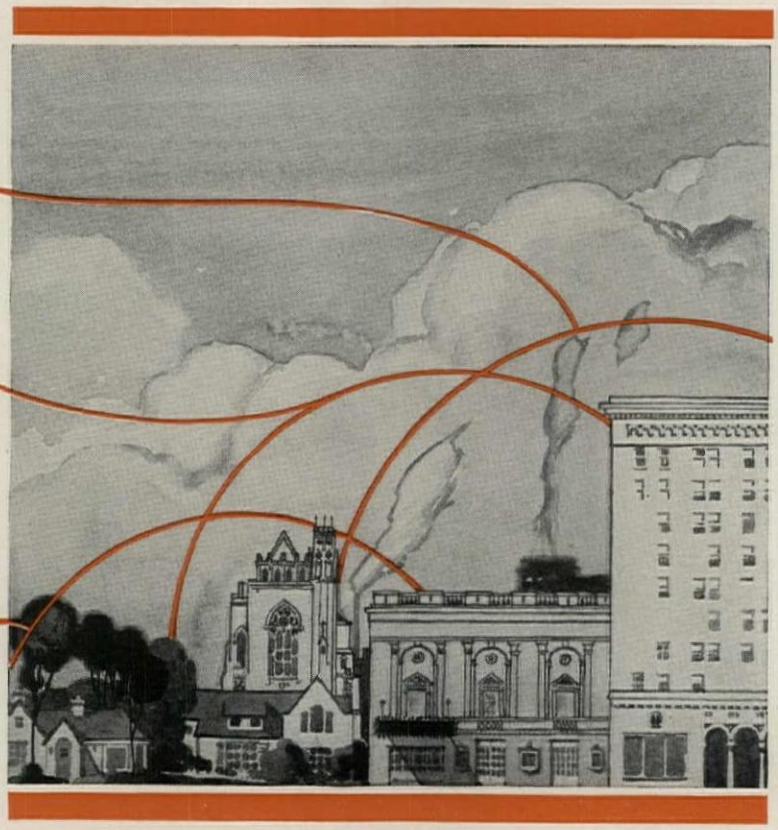
THERE'S A NATIONAL FOR EVERY

National Jacketed Boiler No. 4 Series
Brings a new conception of what a boiler can offer in outstanding attractiveness, full-saving efficiency, and upstanding service; a striking and colorful jacket, and contrasting trim.

National Low Water Line Boiler
Where lack of head room is the problem, this boiler is always the best, often the only, solution; highly efficient.

National Round Boiler
In residential and small building heating, its staggered fire travel leads straight to efficiency, economy, and complete and permanent user satisfaction.

Aero Radiation
Aero Radiators pioneered the way to new heating efficiency, were the first to supply beauty for every setting and utility for every heating purpose.



For all Structures

For large homes or small ones, for theatres, churches, or schools, for apartments or office buildings—for every structure, everywhere, there's a National *Made-to-Measure* Heating System that can be expertly installed, efficiently and economically operated.

The systems embody outstanding equipment which enjoys unusual prestige won in years of demonstrated dependability. Aero Radiators, that pioneered the way to new heating efficiency and beauty, and National Bonded Boilers, renowned for honest ratings and dependable performance, have long been synonymous with complete heating satisfaction.

For all Conditions

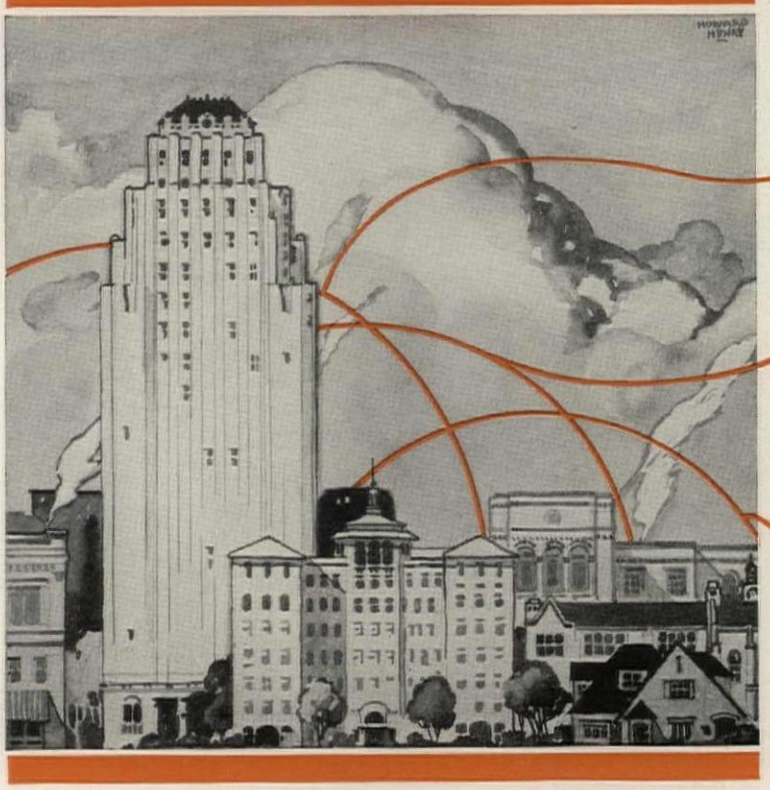
Perhaps the problem is the lack of boiler head room so frequently encountered in theatre buildings, and in structures in tide-water country; or perhaps it is a combustion problem in some locality with a rigid smoke-ordinance.

In either case, there's a National Bonded Boiler to solve it efficiently and completely. Perhaps the problem is the selection of radiation to harmonize with certain finishes or furnishings. There's an Aero Radiator that will fit in perfectly. Whatever the requirements, National *Made-to-Measure* Heating Systems will meet them completely, efficiently, and with permanent dependability.

NATIONAL *Made-to-Measure* HEATING SYSTEMS

HEATING SYSTEM

Building Need



National Jacketed Gas Boiler No. 1

Cleanliness, convenience, accurate maintenance of any desired degree of warmth—are the contributions of this strikingly attractive, highly efficient boiler.

National Super-Smokeless Boiler

Specifically designed for the efficient and smokeless combustion of all grades of fuel. Distinguished for its swirling scarlet flame, and balanced secondary air supply.

National Novus Boilers

These businesslike, dependable, effective boilers have for 18 years been demonstrating their worth in all types of applications, all over the country.

For all Types of Fuel

National Boilers are Bonded to deliver their published ratings, and are designed to perform efficiently with leading types of fuels, such as all domestic sizes of anthracite, bituminous coal, oil, gas and coke. They can be converted on the ground to meet the individual characteristics of the fuel selected. The engineering design of the grate surfaces, air spaces, sizes and shapes of combustion chambers, design of fire travels, waterways, and the systems of air intake and damper control combine to set up a balanced condition resulting in economical combustion and satisfactory heating performance.

For all Purses

The National Protective Payment Plan permits the installation of a National *Made-to-Measure* Heating System on a low down payment, the balance being retired in easy monthly installments. A fire, disability, and death insurance clause protects the purchaser during the period of payment.

One Source of Supply —One Responsibility

All heating needs can now be filled from a single source of supply, backed by a responsibility that does not quibble or compromise, that positively assures satisfaction to the user. Fill out the coupon, and receive full information.

National Boilers are backed by a bond, issued by a great surety company, which guarantees performance, assures satisfaction.

NATIONAL RADIATOR CORPORATION

***Executive Offices* : 55 West 42nd Street, NEW YORK**

National Radiator Corporation,
55 West 42d Street, New York, N. Y.

Please send me full information concerning National *Made-to-Measure* Heating Systems, and the services behind them.

Name.....

Street.....

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

180 *Madison Ave., New York*
Helmle & Corbett, and Henry I. Oser, Architects.
Raisler Heating Co., Heating Contractors.

Textile Trade Uses

SARCO

RADIATOR TRAPS

This 23-story building, designed especially to meet the peculiarly exacting requirements of the textile industry, is equipped throughout with Sarco Radiator Traps.

In selecting Traps for your next building, why not consider these important advantages of the Sarco:

They are unusually long lived because the metal in the expansion element is stressed less than in ordinary constructions.

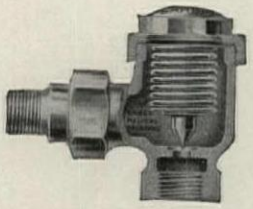
The wide open movement of the valve provides free discharge at all times. No steam or vapor can enter the return. Maximum closing pressure and perfect setting insure a positively tight valve. Sarco Traps will not bind, water hammer or freeze.

Other advantages are explained in Booklet AK-110. Send for a copy.

SARCO CO., Inc.
183 Madison Avenue
New York, N. Y.

Boston Chicago Detroit
Buffalo Cleveland Philadelphia
Pittsburgh St. Louis

Peacock Bros., Ltd., Montreal



FAMOUS USERS OF KEWANEE HIGH PRESSURE WATER SYSTEMS

Mr. De Forest Hulburd

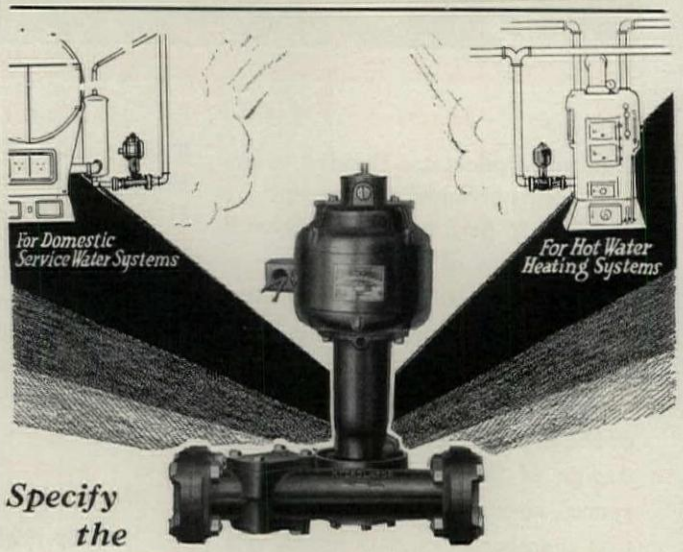
AT Lake Forest, Illinois, on the estate of Mr. De Forest Hulburd, President of the Elgin National Watch Company, a Kewanee System furnishes an unfailing supply of water under strong pressure at all times.

There is a Kewanee *High Pressure* System for water supply, electric light and sewage disposal for every need. There are over *200 models* suitable for every installation from the most modest bungalow to the largest estate. Also a full line of Centrifugal Pumps and Deep Well Turbines from the small $69.50 outfit to those which fit wells from 12″ to 36″ in diameter.

Kewanee will show you how to save dollars and troubles. Write for data.

KEWANEE PRIVATE UTILITIES COMPANY
442 S. Franklin Street Kewanee, Illinois

Dealer Correspondence Invited



Specify the

HYDROLATOR

FOR BETTER HOT WATER CIRCULATION

On hundreds of successful installations the HYDROLATOR has definitely proven its ability to circulate hot water at greatly increased speed. Overcomes practically all forms of sluggish circulation. Write for Bulletin 828-H showing the various uses to which architects and engineers may put this device.

JANETTE MANUFACTURING COMPANY, Dept. A6

Singer Bldg. 149 Broadway NEW YORK
556-58 West Monroe Street Chicago, Illinois.
Representatives in Leading Cities
Real Estate Trust Bldg. PHILADELPHIA

There Is Only One HYDROLATOR
REG. U.S. PAT. OFF.

Occupants of the National Reserve Life Insurance Company, Topeka, Kansas, will never be aware of defects in their splendid heating and ventilating system, so smoothly and efficiently does it function. All sheet metal parts are of durable ARMCO Ingot Iron—specified by Architect Ralph E. Scamell.

ARMCO

INGOT IRON

Years of *dependable performance* for your heating and ventilating systems

Part of a vast system of ARMCO Ingot Iron ventilating ducts, installed at the Muth Division of the National Biscuit Co., Cincinnati, Ohio. The conditions are abnormal here; steam, heat, and moisture combining to attack the metal.

PAINSTAKINGLY, you plan an efficient heating and ventilating system. You protect the duct parts with long-lasting ARMCO Ingot Iron.

Bank on it . . . there are many years of dependable performance ahead for that installation.

Your client receives a substantial service return on his investment. And he has the assurance that those hidden parts so seldom inspected, and so costly to replace, are well protected.

ARMCO Development Engineers will gladly assist you in estimating your sheet metal requirements for heating and ventilating, or any other needs you may have. Just write the office nearest you.

[For additional data on ARMCO Ingot Iron see page 510, Section A of Sweet's Architectural Catalog]

THE AMERICAN ROLLING MILL COMPANY

Executive Offices, **Middletown, Ohio**

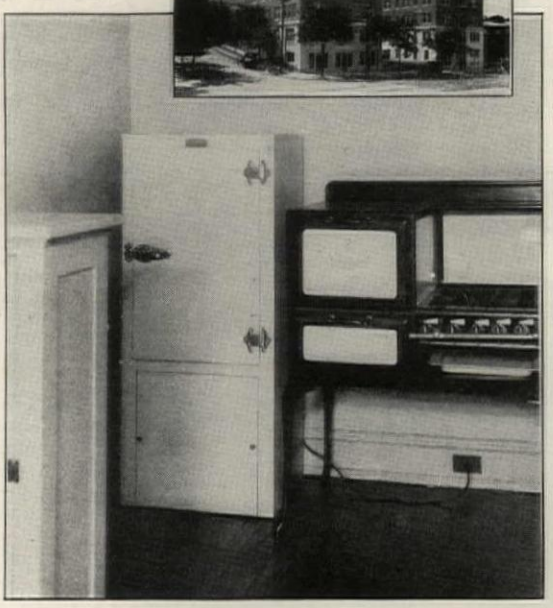
Export: The ARMCO International Corp. *Cable Address*—ARMCO, Middletown (O)

DISTRICT OFFICES

Chicago	Detroit	Pittsburgh
Cincinnati	New York	St. Louis
Cleveland	Philadelphia	San Francisco

ARMCO INGOT IRON RESISTS RUST

Frigidaire gives perfect refrigeration even though placed beside the range in the Altamont Apartments.



Frigidaire adds to the convenience of Claridge Manor kitchens.

"Frigidaire was placed in these apartments *to meet public demand*"

writes James H. Turner, Resident Manager, Altamont and Claridge Manor Apartments in Birmingham

• • •

IN Birmingham as in other cities throughout the country apartment residents prefer Frigidaire. Let's hear about it direct from James H. Turner, Resident Manager of two of the city's largest apartment buildings . . . the Altamont and the Claridge Manor.

"Frigidaire was placed in these two apartments to meet public demand. We found that our guests were not satisfied with ice . . . that we could more easily rent apartments if equipped with automatic refrigerators. We considered all electrical refrigerators before selecting Frigidaire. We believe it is the best refrigeration for apartment houses."

And thousands of other apartment managers and owners believe it. They agree with Mr. Turner that public demand, easier rentals, quiet operation, quick freezing, efficient and dependable service are the best reasons in the world for selecting Frigidaire.

Dependable refrigeration means additional profit from your apartments or public buildings . . . so investigate the features which have placed more Frigidaires in use than all other electric refrigerators combined . . . take a moment now and drop us a line requesting complete information about Frigidaire equipment.

FRIGIDAIRE CORPORATION, *Subsidiary of General Motors Corporation,* Dayton, Ohio

THE JOHNS-MANVILLE CORPORATION ANNOUNCES *the acquisition of*

SANACOUSTIC TILE

(A Development of C. F. Burgess Laboratories, Inc.)

This interesting sound-absorbing interior finish becomes an important part of the line of the pioneer of Architectural Acoustics

THE merits of Sanacoustic Tile are already known to the Architectural profession.

By adding this splendid acoustical material to its line, Johns-Manville follows its fixed policy of leadership in the field of Architectural Acoustics.

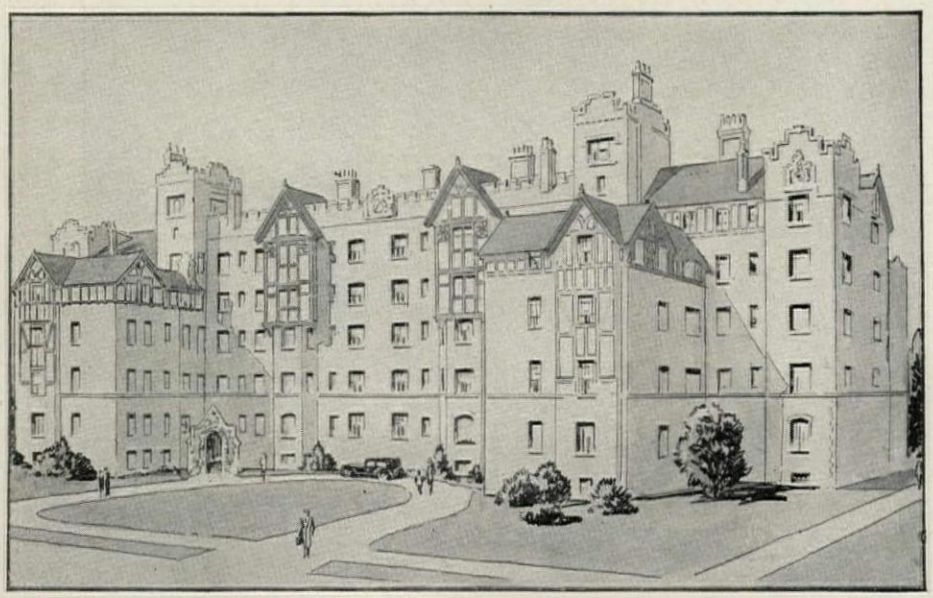
Boy's natatorium, Oak Park High School, Oak Park, Ill.
Childs & Smith, Architects, Chicago, Ill.
Aluminum Sanacoustic Tile upon all ceiling panels.

Johns-Manville Sanacoustic Tile has a high co-efficient of sound-absorption at a low cost per unit of absorption. With Johns-Manville Banroc Wool, a fibrous mineral, as the sound absorbing element, it is permanent; its sound-absorbing qualities *remain* permanent; it is an excellent light reflector, it has an easily cleaned, sanitary surface, and it may be installed in old or new buildings in an economical manner. In new work it provides a complete substitute for metal lath and plaster on furred ceilings.

Johns-Manville Acoustical Engineers are always at the service of architects without obligation. These men welcome opportunities to discuss any problem involving the acoustics of room interiors.

Johns-Manville

SOUND CONTROL AND
ACOUSTICAL TREATMENT



BEAUTIFUL MODERN SCARSWOLD APARTMENTS, *Scarsdale, New York, Electrolux-equipped. Townsend, Steinle and Haskel, architects.*

GAS REFRIGERATION

specified for beautiful Scarswold Apartments

Architect chooses Electrolux because of noiseless, economical operation

ABSOLUTE NOISELESSNESS . . . plenty of large ice cubes . . . perfect refrigeration at all times . . . no servicing or repair troubles. These are a few of the advantages Electrolux brings to the beautiful Scarswold Apartments, Scarsdale, New York.

And the Scarswold is but one of many fine new buildings that are installing the Gas Refrigerator. Increasing numbers of architects are specifying Electrolux for apartments. It's hardly surprising, Electrolux has so many unique features.

No Machinery . . . No Noise

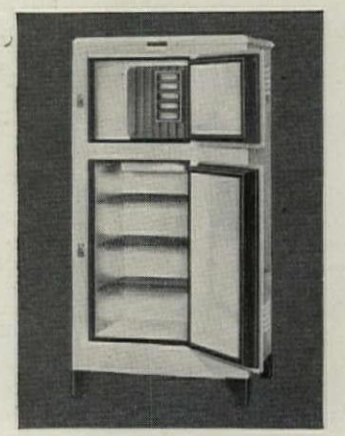
The Gas Refrigerator has no machinery. There are no moving parts to wear, need attention, or make the slightest sound. A tiny gas flame and a trickle of water do all the work of making cold. And no moving parts means no *whirr* or hum. The Electrolux is absolutely noiseless.

And, an important item, the Gas Refrigerator costs a great deal less to operate than any other refrigerating system.

A letter will bring you full information on Electrolux. No obligation. Just address your request to: Servel Sales, Inc., Evansville, Indiana.

(*Left*) KITCHENETTE MODEL *Electrolux is ideal for the small family. Food capacity—4 cubic feet, 36 large ice cubes between meals.*

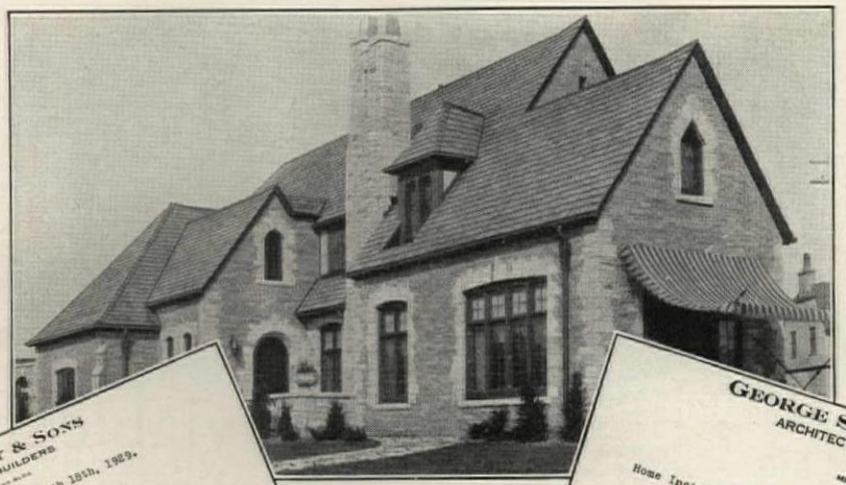
(*Right*) CHEF MODEL, *specially designed for medium sized family. 7 cubic feet food capacity, 50 large ice cubes.*



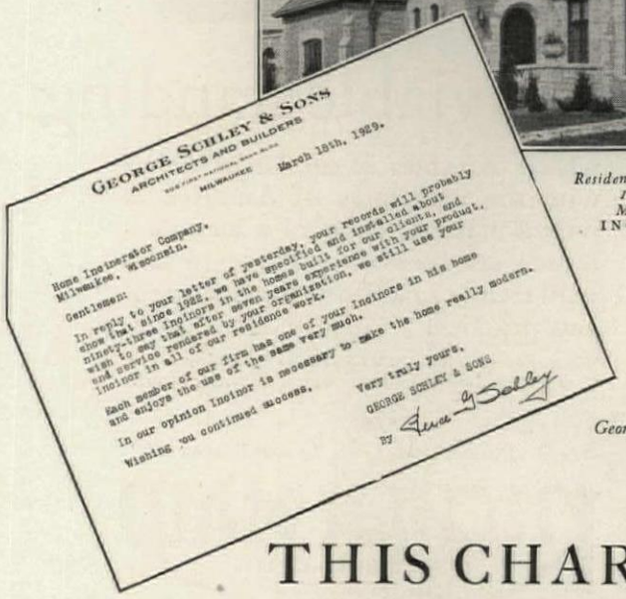
ELECTROLUX

THE GAS REFRIGERATOR

MADE BY SERVEL



Residence of M. D. Waldheim
1027 Lake Drive
Milwaukee, Wis.
INCINOR *equipped*



GEORGE SCHLEY & SONS
ARCHITECTS AND BUILDERS
MILWAUKEE

March 18th, 1929.

Home Incinerator Company,
Milwaukee, Wisconsin.

Gentlemen:

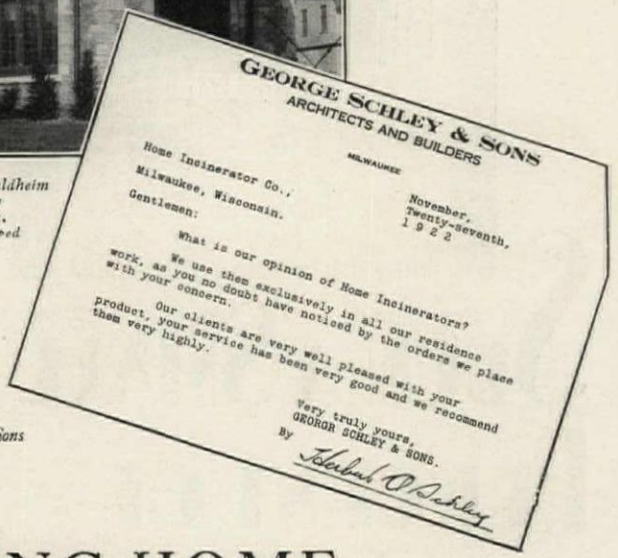
In reply to your letter of yesterday, your records will probably show that since 1922, we have specified and installed about ninety-three Incinors in the homes built for our clients, and wish to say that after seven years experience with your product, and service rendered by your organization, we still use your Incinor in all of our residence work.

Each member of our firm has one of your Incinors in his home and enjoys the use of the same very much.

In our opinion Incinor is necessary to make the home really modern.

Wishing you continued success,

Very truly yours,
GEORGE SCHLEY & SONS
By



GEORGE SCHLEY & SONS
ARCHITECTS AND BUILDERS
MILWAUKEE

November, Twenty-seventh, 1922

Home Incinerator Co.,
Milwaukee, Wisconsin.

Gentlemen:

What is our opinion of Home Incinerators?

We use them exclusively in all our residence work, as you no doubt have noticed by the orders we place with your concern.

Our clients are very well pleased with your product, your service has been very good and we recommend them very highly.

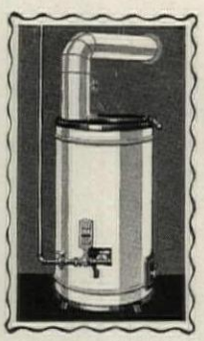
Very truly yours,
GEORGE SCHLEY & SONS.
By

George Schley & Sons
Architects

THIS CHARMING HOME IS INCINOR-EQUIPPED

For Incineration, architects are specifying "INCINOR"

For seven years Mr. Perce G. Schley, A. I. A., designer for the Milwaukee architects, Geo. Schley & Sons, has specified INCINOR for his charming residences. Notice the letter dates—seven years' unqualified endorsement! Like many another architect alert to contemporary trend, Mr. Schley bases his sound, domestic design on owner pleasure and comfort. INCINOR, as an important element of comfort, is specified everywhere by modern architecture.



For incineration, advise INCINOR, the portable, gas-fired Home Incinerator, which destroys all garbage, trash and rubbish as fast as it accumulates, burning it with gas, "the decent way." INCINOR reduces several bushels of refuse to a handful of clean, sterile ash—safely, quickly, completely, inexpensively.

Investigate "INCINOR"—*send the coupon today* for complete Architectural File Data.

Sweet's Catalog C-4089

HOME INCINERATOR CO., MILWAUKEE, WISCONSIN
SECURITY BUILDING

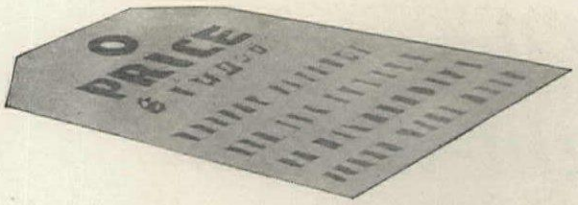
·INCINOR·
THE HOME INCINERATOR
Good Riddance
GARBAGE .. RUBBISH .. TRASH

HOME INCINERATOR COMPANY
Dept. 1-6 Security Building, Milwaukee, Wis.
Please send me free Architectural File data on home incineration.

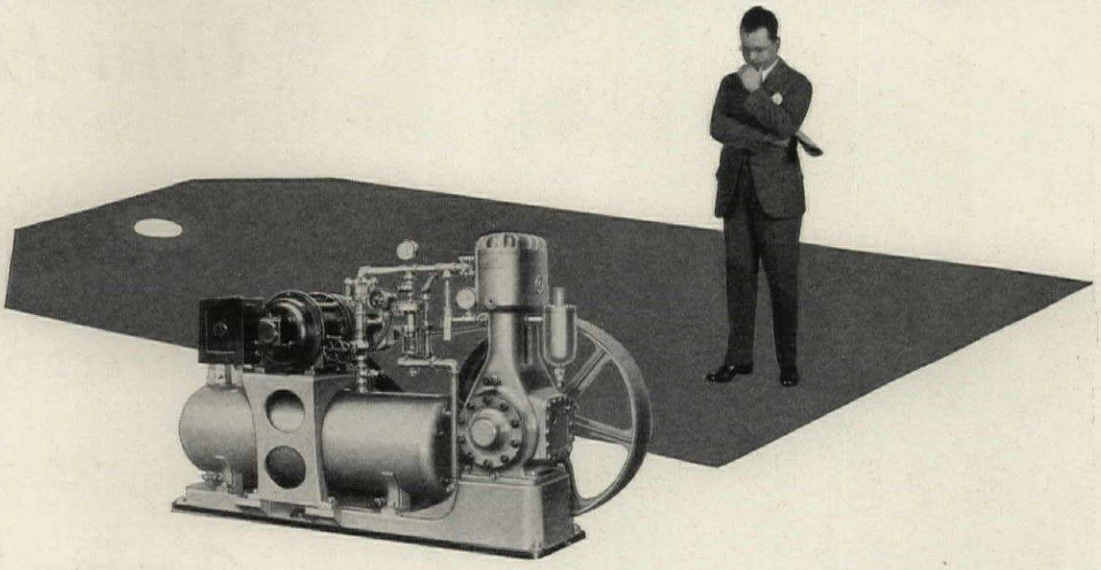
BURN IT WITH GAS — THE DECENT WAY

Name.....

Address.....



Does the Shadow of a Price Tag—



Confuse Your Judgment of Value?

Sometimes price tags are confusing to the buyer of refrigeration because they tend to distort and mislead one's judgment of value.

But the measurement of true value is simple when you forget the price tag figures and look at the accurate yardstick of *real worth*—"cost of ownership."

Cost of ownership immediately fixes value without guesswork. It includes depreciation, *plus* cost of service, *plus* operating expense. It quickly determines the actual value of the equipment.

Judge Lipman Electric Refrigeration on this value-revealing basis. Its price is fair. Its depreciation is small. Its cost of service is negligible. Its operating cost is surprisingly low. In short, it has the *lowest cost of ownership*.

Lipman maintains a free consulting service for architects. For the address of the office nearest you, consult Sweet's Catalog, pages C-3576 and C-3577, or write direct to us. The fullest cooperation will be extended to you without cost or obligation.

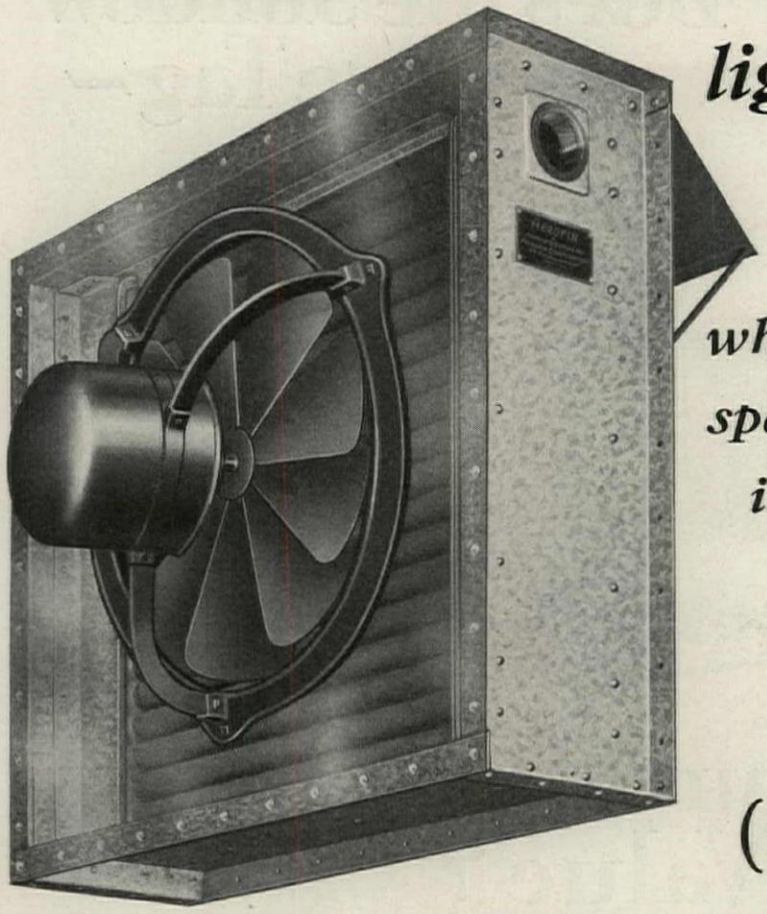
Lipman
ELECTRIC REFRIGERATION

GENERAL REFRIGERATION CO., Beloit, Wis. ☐ Send Booklet "F-27." ☐ Send Engineer's Name

Name..... Firm Name.....

Address.....City and State.....

—and the modern light-weight Unit Heater,



which has revolutionized space heating practice, is the direct offspring of

AEROFIN

(*The Standardized Light-Weight Fan System Heat-Surface*)

To make sure that you select the right Unit Heater all you need do is make sure that the Heat-Surface is AEROFIN*

In Unit Heaters offered by these leading Manufacturers the Heat-Surface is AEROFIN

B. F. Sturtevant Company
Boston, Mass.

Buffalo Forge Company
Buffalo, N. Y.

Clarage Fan Company
Kalamazoo, Mich.

American Blower Corporation
Detroit, Mich.

Ilg Electric Ventilating Company
Chicago, Ill.

Garden City Fan Company
Chicago, Ill.

Canadian Blower & Forge Co.
Kitchener, Ont.

Sheldon's, Limited
Galt, Ont.

Canadian Sirocco Co.
Windsor, Ont.

B. F. Sturtevant Co. of Canada, Ltd.
Galt, Ont.

**Made in 3 Types and more than 60 Standard Encased Unit Sizes, for pressures up to 350 lbs. gauge*

Write to any of above for Unit Heater Data or to us for Aerofin information. Ask for Bulletin F-69

AEROFIN CORPORATION

Burnham Building
CHICAGO

850 Frelinghuysen Avenue, NEWARK, N. J.
11 West 42nd Street, NEW YORK

Oliver Building
PITTSBURGH

Land Title Building
PHILADELPHIA

United Artists Building
DETROIT

Paul Brown Building
ST. LOUIS

AEROFIN is sold only by Manufacturers of nationally advertised Fan Heating Apparatus

THE MODINE CABINET HEATER

Replaces Ordinary Radiators and Enclosures

THOSE devoted to the designing of beautiful homes cannot help but have a deep professional interest in Modine Cabinet Heaters . . . . Obviously, they enhance room beauty by blending unobtrusively into any scheme of room decoration . . . . Better heating . . . more healthful, more easily controlled . . . is a proven engineering fact that has been demonstrated by six years of field and laboratory service . . . . The floor type is illustrated above. The Wall Type Cabinet Heater is also available and is recommended where space saving is a factor.

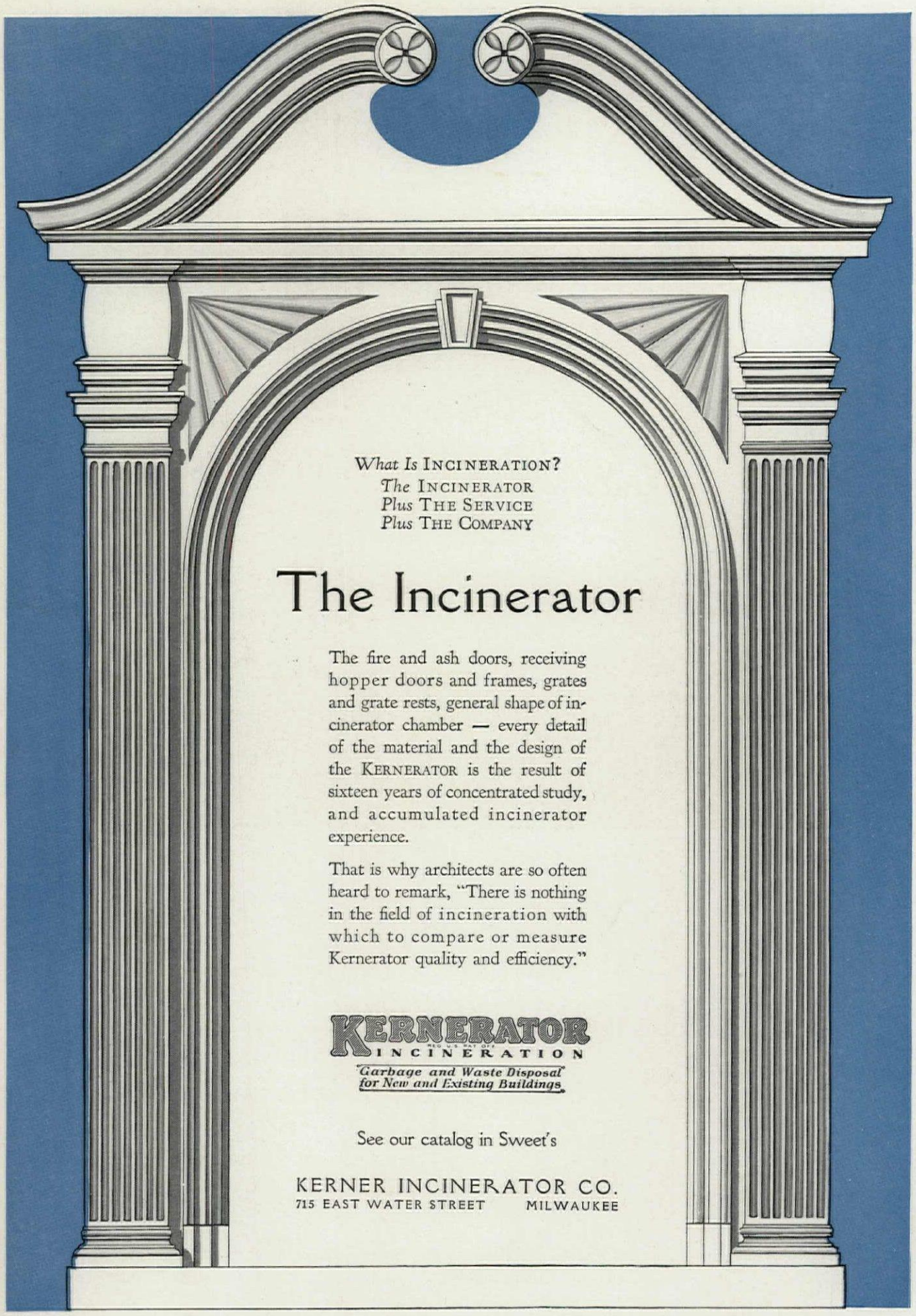
Our Newest Catalog, in full color, will give you complete facts . . . Your copy is awaiting your request.

Originators of
COPPER RADIATION

USED IN PLACE OF CAST IRON RADIATION SINCE 1922

Manufacturers of
MODINE UNIT HEATERS

MODINE MANUFACTURING CO., (Heating Division) 1718 Racine St., RACINE, WIS.
Branch Offices in all Large Cities . . . . . London Office: S. G. LEACH & CO. Ltd., 26-30 Artillery Lane.



What Is INCINERATION?
The INCINERATOR
Plus THE SERVICE
Plus THE COMPANY

The Incinerator

The fire and ash doors, receiving hopper doors and frames, grates and grate rests, general shape of incinerator chamber — every detail of the material and the design of the KERNERATOR is the result of sixteen years of concentrated study, and accumulated incinerator experience.

That is why architects are so often heard to remark, "There is nothing in the field of incineration with which to compare or measure Kernerator quality and efficiency."

KERNERATOR
REG. U.S. PAT. OFF.
INCINERATION

"Garbage and Waste Disposal" for New and Existing Buildings

See our catalog in Sweet's

KERNER INCINERATOR CO.
715 EAST WATER STREET MILWAUKEE

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.

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.

AIR FILTERS

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.
Making the Most of Your Protectomotor. Folder, 6 pp., 3½ x 6½ ins. Illustrated.
The Protectomotor Industrial Air Filter. Folder, 6 pp., 4 x 9 ins. Illustrated.
Introducing the Model C. P. Pipe Line Filter. Folder, 8 pp., 4 x 9 ins. Illustrated.

ASPHALT

Barber Asphalt Company, New York, Philadelphia, Chicago, Pittsburgh, Kansas City, St. Louis, San Francisco.
Specifications for Applying Genasco Asphalt Mastic. Booklet, 16 pp., 8 x 9 ins.
Genasco Trinidad Lake Asphalt Mastic. Brochure, 32 pp., 6 x 9 ins.
Specifications for Applying Genasco. Booklet, 16 pp., 8 x 10½ ins.

BATHROOM FITTINGS

A. P. W. Paper Co., Albany, N. Y.
Onliwon for Fine Buildings. Folder, 8 pp., 3¼ x 6 ins. Illustrated. Deals with toilet paper fittings of metal and porcelain.
Architects' File Card. 8½ x 11 ins. Illustrated. Filing card on toilet paper and paper towel cabinets.
A Towel Built for Its Job. Booklet, 8 pp., 4¼ x 9⅝ ins. Illustrated. Paper Towel System and Cabinets.
Cabinets and Fixtures. Booklet, 32 pp., 5¾ x 4¾ ins. Illustrated. Catalog and price list of fixtures and cabinets.

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).

Common Brick Mfrs. Assn. of America, 2134 Guarantee Title Bldg., Cleveland.
Brick; How to Build and Estimate. Brochure, 96 pp., 8½ x 11 ins. Illustrated. Complete data on use of brick.
The Heart of the Home. Booklet, 24 pp., 8½ x 11 ins. Illustrated. Price 25 cents. Deals with construction of fireplaces and chimneys.
Skintled Brickwork. Brochure, 16 pp., 8½ x 11 ins. Illustrated. Tells how to secure interesting effects with common brick.
Building Economy. Monthly magazine, 22 pp., 8½ x 11 ins. Illustrated. $1 per year, 10 cents a copy. For architects, builders and contractors.

Hanley Company, Bradford, Pa.
General Catalog. 16 pp. 8½ x 11 ins. Illustrated.
Bradford Reds. Folder. 8 pp., 3 x 8 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., 3⅜ x 6½ 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, 8½ 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.

CEMENT—Continued

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

CONCRETE BUILDING MATERIALS

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.

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.

The Vortex Mfg. Co., Cleveland, Ohio.
Par-Lock Specifications "Forms A and B" for dampproofing and plaster key over concrete and masonry surfaces.
Par-Lock Specification "Form J" for dampproofing the tile wall surfaces that are to be plastered.
Par-Lock Dampproofing. Specification Forms C, F, I, and J. Sheets 8½ x 11 ins. Data on gun-applied asphalt dampproofing for floors and walls.

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.

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.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 189*

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

Baldor Electric Co., 4358 Duncan Avenue, St. Louis, Mo.
Baldor Electric Motors. Booklet, 14 pp., 8 x 10½ ins. Illustrated. Data regarding motors.

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.

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 and Cabinets (Catalog 42-A). Booklet, 32 pp., 8½ x 11 ins. Illustrated. Important data on these details of equipment.
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.

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.

FLOOR HARDENERS (CHEMICAL)—Continued

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

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

American Blue Stone Co., 101 Park Avenue, New York, N. Y.
Non-Slip Floors. Brochure, 12 pp., 8½ x 11 ins. Illustrated.

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.

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.

Bonded Floors Company, Inc., 1421 Chestnut St., Philadelphia, Pa.
A series of booklets, with full color inserts showing standard colors and designs. Each booklet describes a resilient floor material as follows:
Battleship Linoleum. Explains the advantages and uses of this durable, economical material.
Marble-ized (Cork Composition) Tile. Complete information on cork composition marble-ized tile and many artistic effects obtainable with it.
Treadlite (Cork Composition) Tile. Shows a variety of colors and patterns of this adaptable cork composition flooring.
Natural Cork Tile. Description and color plates of this superquiet, resilient floor.
Resilient Floors in Schools. Resilient Floors in Stores. Resilient Floors in Hospitals. Resilient Floors in Offices. Resilient Floors in Apartments and Hotels. Booklets, 8 pp., 8½ x 11 ins. Illustrated.
Specifications for Resilient Floors. Leather bound booklet, 48 pp., 8½ x 11 ins. Illustrated. Practical working specifications for installing battleship linoleum, cork composition tile and cork tile.

Carter Bloxonend Flooring Co., Keith & Perry Bldg., Kansas City, Missouri.
Bloxonend Flooring. Booklet, 3¼ x 6¼. ins., 20 pp. Illustrated. Describes uses and adaptability of Bloxonend Flooring to concrete, wood or steel construction, and advantages over loose wood blocks.
File Folder. 9⅜ x 11¾ ins. For use in connection with A. I. A. system of filing. Contains detailed information on Bloxonend Flooring in condensed loose-leaf form for specification writer and drafting room. Literature embodied in folder includes standard Specification Sheet covering the use of Bloxonend in general industrial service and Supplementary Specification Sheet No. 1, which gives detailed description and explanation of an approved method for installing Bloxonend in gymnasiums, armories, drill rooms and similar locations where maximum resiliency is required.

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

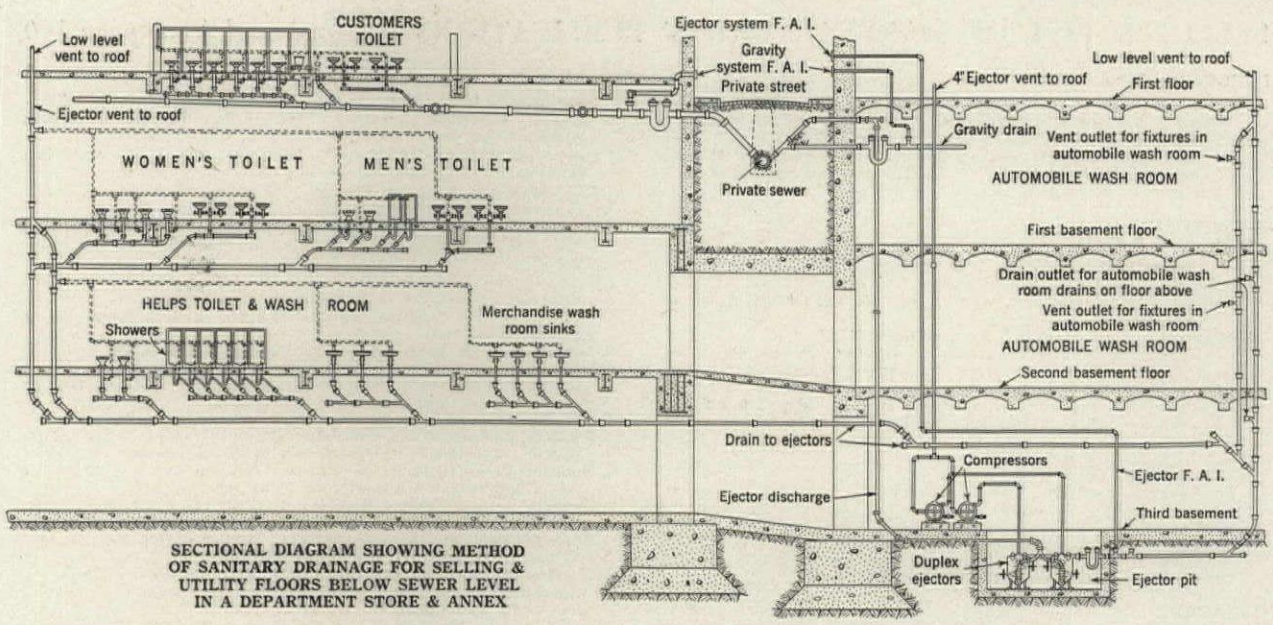
Thomas Moulding Floor Co., 165 W. Wacker Drive, Chicago, Ill.
Better Floors. Folder, 4 pp., 11¼ x 13¾ ins. Illustrated. Floors for office, administration and municipal buildings.
Better School Floors. Folder, 4 pp., 11¼ x 13¾ ins. Illustrated.
Characteristics, Specifications and Uses. Brochure, 16 pp., 11¼ x 13¾ ins. Illustrated. Data on floors.

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.

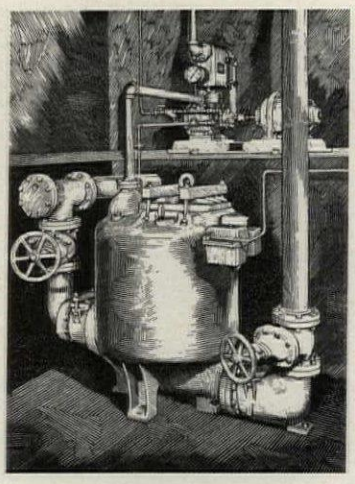
U. S. Gypsum Co., Chicago.
Pyrobar Floor Tile. Folder, 8½ x 11 ins. Illustrated. Data on building floors of hollow tile and tables on floor loading.

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.



SECTIONAL DIAGRAM SHOWING METHOD OF SANITARY DRAINAGE FOR SELLING & UTILITY FLOORS BELOW SEWER LEVEL IN A DEPARTMENT STORE & ANNEX

When basements are below sewer level



Jennings Sewage Ejectors are furnished in standard sizes with capacities ranging from 30 to 1,500 g.p.m. Heads up to 50ft. Write for Bulletin 67.

GRAVITY flow from fixtures to sewer is unnecessary if the installation of a Jennings Sewage Ejector is planned. Lavatories, automobile wash rooms and other facilities can be placed in department store basements below street sewer grade. Automatically controlled, working by low pressure air furnished by a Nash Hytor Compressor, the Jennings Ejector will handle unscreened sewage and drainage continually at low operating cost and with a minimum of attention. Simplified in design, it employs no troublesome air valves or air storage tanks. All moving parts operate out of contact with the sewage. Capacity cannot be lowered . . . as so often happens in other type ejectors when impellers and other parts become clogged or caked with solid matter. The Jennings retains its original efficiency throughout its entire life.

RETURN LINE AND AIR LINE VACUUM HEATING PUMPS ~ CONDENSATION PUMPS ~ COMPRESSORS AND VACUUM PUMPS FOR AIR AND GASES ~ STANDARD AND SUCTION CENTRIFUGAL PUMPS ~ HOUSE SERVICE PUMPS ~ SEWAGE EJECTORS ~ SUMP PUMPS ~ FLAT BOX PUMPS ~ MARINE PUMPS

Jennings Pumps

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

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 190*

FLOORING—Continued

Art Portfolio of Floor Designs. 9¼ x 12¼ ins. Illustrated in colors. Patterns of quarry tiles for floors.

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.

New York Galleries, Madison Avenue and 48th Street, New York.
A Group of Distinguished Interiors. Brochure, 4 pp., 8¾ x 11¾ ins. Filled with valuable illustrations.

GARAGES

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.

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., 5⅝ 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.

McKinney Mfg. Co., Pittsburgh, Pa.
Forged Iron by McKinney. Booklet, 6 x 9 ins. Illustrated. Deals with an excellent line of builders' hardware.
Forged Lanterns by McKinney. Brochure, 6 x 9 ins. Illustrated. Describes a fine assortment of lanterns for various uses.

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.

HEATING EQUIPMENT—Continued

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.
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.

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.

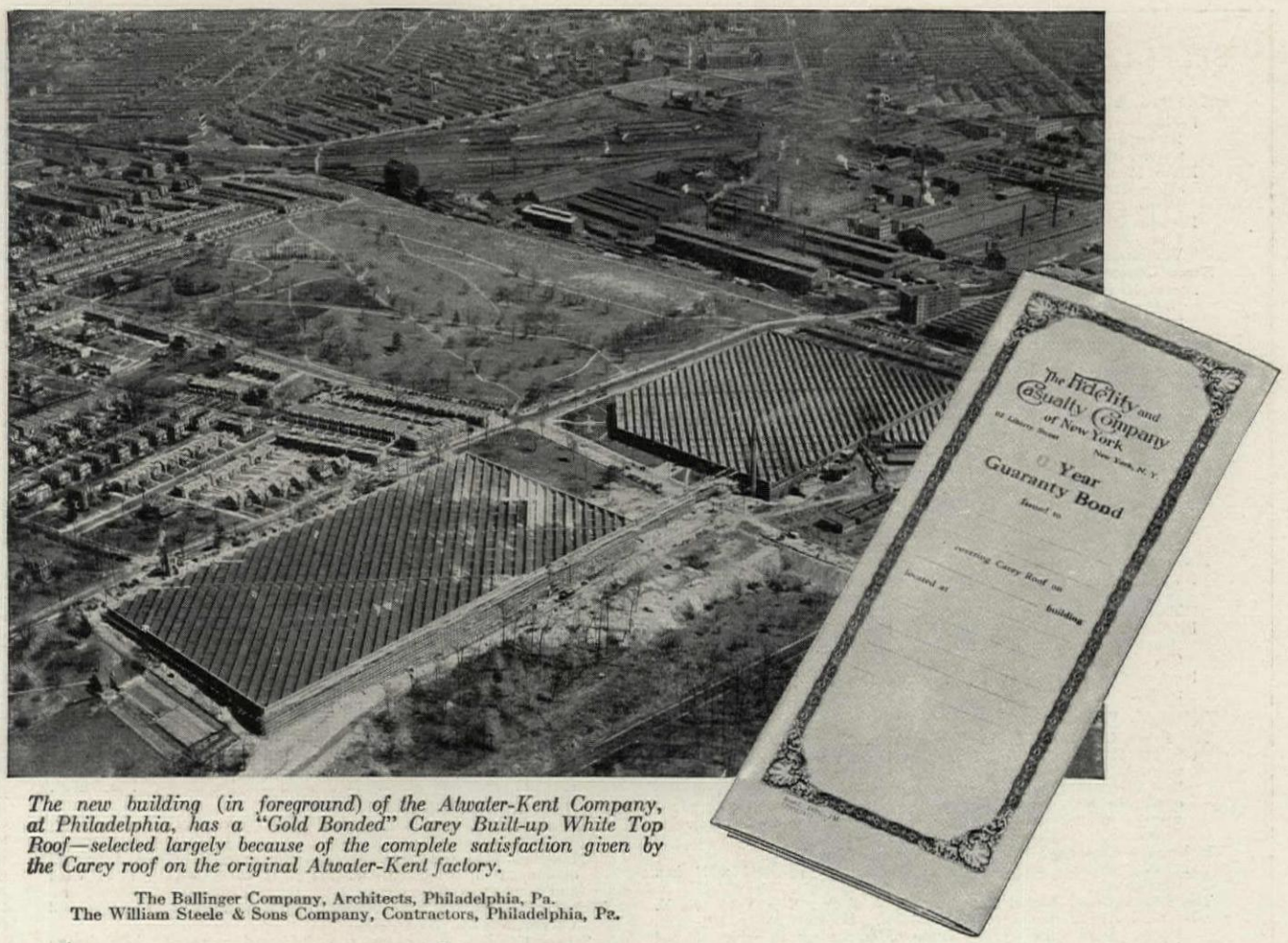
Modine Mfg. Co., Racine, Wisc.
Modine Copper Radiation. Booklet, 28 pp. 8½ x 11 ins. Illustrated. Deals with industrial, commercial and domestic heating.
A Few Short Years. Folder. 4 pp. 8½ x 11 ins. Illustrated. Heating for garages.
Dairy Plant Heating. Folder. 4 pp., 8½ x 11 ins. Illustrated.

Nash Engineering Company, South Norwalk, Conn.
No. 37. Devoted to Jennings Hytor Return Line Vacuum Heating Pumps, electrically driven, and supplied in standard sizes up to 300,000 square feet equivalent direct radiation.
No. 16. Dealing with Jennings Hytor Air Line Heating Pumps.
No. 17. Describing Jennings Hytor Condensation Pumps, sizes up to 70,000 square feet equivalent direct radiation.
No. 25. Illustrating Jennings Return Line Vacuum Heating Pumps. Size M, for equivalent direct radiation up to 5,000 square feet.

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.

Oil Heating Institute, 420 Madison Ave., New York, N. Y.
What About the Supply of Oil Fuel? Booklet, 16 pp., 5½ x 8 ins. Illustrated.

Petroleum Heat & Power Co., 511 Fifth Avenue, New York, N. Y.
Heating Homes the Modern Way. Booklet, 8½ x 11¾ ins. Illustrated. Data on the Petro Burner.



The new building (in foreground) of the Atwater-Kent Company, at Philadelphia, has a "Gold Bonded" Carey Built-up White Top Roof—selected largely because of the complete satisfaction given by the Carey roof on the original Atwater-Kent factory.

The Ballinger Company, Architects, Philadelphia, Pa.
The William Steele & Sons Company, Contractors, Philadelphia, Pa.

Announcing
Carey GOLD BONDED *Roofs*

ARCHITECTS know that every Carey Built-up Roof has in it those plus qualities of good workmanship and good materials that bring many extra years of repair-free protection.

And now, another outstanding advantage has been added to every Carey Built-up Roof. Each is GOLD BONDED. Five to twenty year guaranties on Carey Built-up Roofs, applied as Carey specifies. Specification roof bonds issued by the Fidelity & Casualty Company of New York . . . forty-million-dollar surety!

The good name Carey has now even greater significance.

THE PHILIP CAREY COMPANY - *Lockland* - CINCINNATI, OHIO

Carey
BUILT UP ROOFS
"A roof for every building"

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 192*

HEATING EQUIPMENT—Continued

Residence Oil Burning Equipment. Brochure, 6 pp., 8½ x 11 ins. Illustrated. Data regarding Petro Burner in a bulletin approved by Investigating Committee of Architects and Engineers.

Petro Mechanical Oil Burner & Air Register. Booklet, 24 pp., 8½ x 11 ins. Illustrated. Data on industrial installations of Petro Burners.

Present Accepted Practice in Domestic Oil Burners. Folder, 4 pp., 8½ x 11 ins. Illustrated. A reprint from Heating and Ventilating Magazine.

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., 6⅞ x 9 ins. Illustrated. Complete line of magazine feed cast iron sectional and steel tubular heaters.

The Fire that Burns Uphill. Brochure, 24 pp., 6⅞ 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.

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.

Wilmot Castle Company, Rochester, N. Y.

Sterilizer Equipment for Hospitals. Booklet, 76 pp., 8½ x 11 ins. Illustrated. Gives important and complete data on sterilization of utensils and water, information on dressings, etc.

Sterilizer Specifications. Brochure, 12 pp., 8½ x 11 ins. Practical specifications for use of architects and contractors.

Architects' Data Sheets. Booklet, 16 pp., 8½ x 11 ins. Illustrated. Information on piping, venting, valving and wiring for hospital sterilizer installations.

Hospital Sterilizing Technique. Five booklets, 8 to 16 pp., 6 x 9 ins. Illustrated. Deals specifically with sterilizing instruments, dressings, utensils, water, and rubber gloves.

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.

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.

Cabot, Inc., Samuel, Boston, Mass.

Cabot's Insulating Quilt. Booklet, 7½ x 10½ ins., 24 pp. Illustrated. Deals with a valuable type of 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.

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.

Pick-Barth Company, Inc., Albert, 1200 West 35th St., Chicago, and Cooper Square, New York.

School Cafeteria. Booklet, 6 x 9 ins. Illustrated. The design and equipment of school cafeterias with photographs of installation and plans for standardized outfits.

LABORATORY EQUIPMENT

Alberene Stone Co., 153 West 23rd Street, New York City.

Booklet, 8¾ 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.

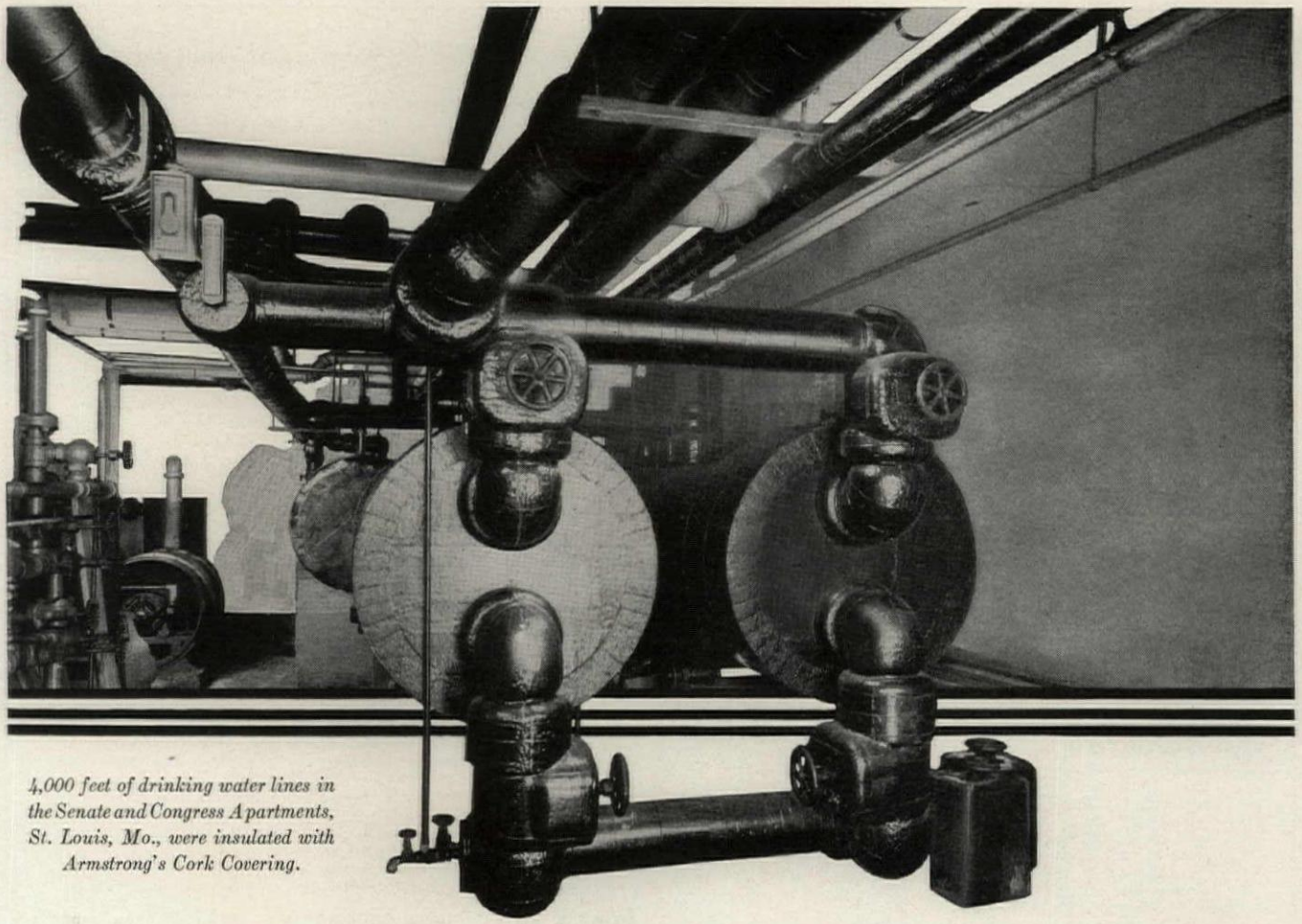
Longspan ¾-inch Rib Lath. Folder, 4 pp., 8½ x 11 ins. Illustrated. Deals with a new type of V-Rib expanded metal.

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.



4,000 feet of drinking water lines in the Senate and Congress Apartments, St. Louis, Mo., were insulated with Armstrong's Cork Covering.

Perfect Fitting...Moisture Proof TROUBLE FREE

ARMSTRONG'S Cork Covering meets all the requirements of an ideal insulation for refrigerated drinking water systems.

First, it is perfect fitting—molded in sections to the exact measurements of standard pipe sizes and fittings. Carefully applied according to instructions, there are no air pockets where moisture may condense.

Second, it is moisture-proof. The cork granules of which it is made are naturally resistant to moisture. In addition, Armstrong's Cork Covering is protected by a heavy coating of air and moisture-proof asphalt mastic, ironed on at the factory.

Third, it is trouble free. Lines properly insulated with Armstrong's Cork Covering can safely be enclosed in walls and pipe chases with the assurance that the insulation will last and continue to function effectively for the life of the building.

The Armstrong engineering service offers to architects and engineers, free of cost, the benefit of years of experience in designing drinking water systems. Write for the book, "Refrigerated Drinking Water." Armstrong Cork & Insulation Company, 900 Concord Street, Lancaster, Pa.; McGill Building, Montreal; 11 Brant Street, Toronto.

Armstrong's Cork Covering

for Cold Lines, Coolers and Tanks

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 194*

LAUNDRY CHUTES

The Pfaudler Company, 217 Cutler Building, Rochester, N. Y.
Pfaulder Glass-Lined Steel Laundry Chutes. Booklet, 5⅛ x 7⅜ ins., 16 pp. Illustrated. A beautifully printed brochure describing in detail with architects' specifications THE PFAUDLER GLASS-LINED STEEL LAUNDRY CHUTES. Contains views of installations and list of representative examples.

LAUNDRY MACHINERY

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

Troy Laundry Machinery Co., Inc., 9 Park Place, New York City.
Laundry Machinery for Large Institutions. Loose-Leaf booklet, 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.

LIBRARY EQUIPMENT

Art Metal Construction Co., Jamestown, N. Y.
Planning the Library for Protection and Service. Brochure, 52 pp., 8½ x 11 ins. Illustrated. Deals with library fittings of different kinds.

Library Bureau Division. Remington Rand, N. Tonawanda, N. Y.
Like Stepping into a Story Book. Booklet, 24 pp., 9 x 12 ins. Deals with equipment of Los Angeles Public Library.

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.

Pass & Seymour, Inc., Syracuse, N. Y.
Lighting Your Home with Alabox. Folder, 6 pp., 3 x 6 ins.

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

Arthur Todhunter, 119 E. 57th St., New York, N. Y.
Georgian Mantels. New booklet, 24 pp., 5¾ x 6¼ 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.

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. 3¾ 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

Cabot, Inc., Samuel, Boston, Mass.
Cabot's Creosote Stains. Booklet, 4 x 8½ ins., 16 pp. Illustrated.

Minwax Company, 11 West 42nd Street, New York, N. Y.
Color Card,—Brick and Cement Coating. Folder, 4 pp., 8½ x 11 ins. Illustrated. It describes a waterproof paint for stucco, brick, and concrete.

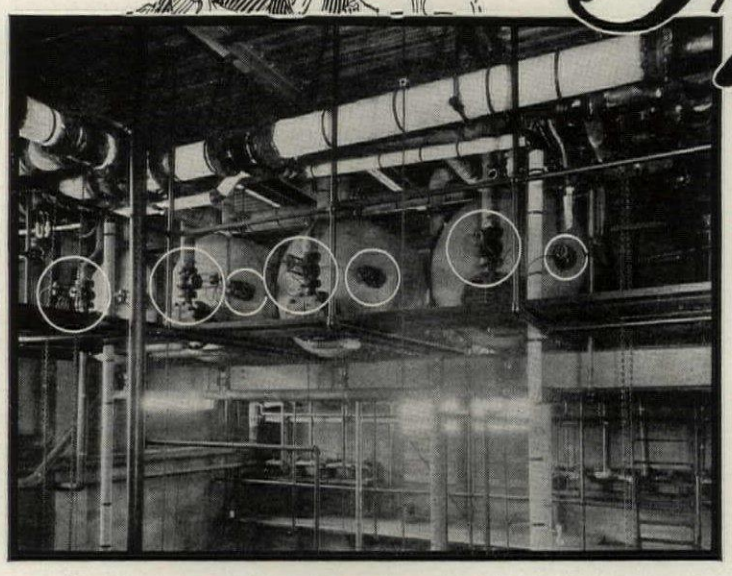
National Lead Company, 111 Broadway, New York, N. Y.
Handy Book on Painting. Book, 5½ x 3¾ ins., 100 pp. Gives directions and formulæ for painting various surfaces of wood, plaster, metals, etc., both interior and exterior.
Red Lead in Paste Form. Booklet. 6¼ x 3½ ins., 16 pp. Illustrated. Directions 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.
Painting Concrete and Stucco Surfaces. Bulletin No. 1. 8½ x 11 ins., 8 pp. Illustrated. A complete treatise with complete specifications on the subject of Painting of Concrete and Stucco Surfaces. Color chips of paint shown in bulletin.
Enamel Finish for Interior and Exterior Surfaces. Bulletin No. 2, 8½ x 11 ins., 12 pp. Illustrated. Thorough discussion, including complete specifications for securing the most satisfactory enamel finish on interior and exterior walls and trim.
Painting and Decorating of Interior Walls. Bulletin No. 3, 8½ x 11 ins., 20 pp. Illustrated. An excellent reference book on Flat Wall Finish, including texture effects, which are taking the country by storm. Every architect should have one on file.

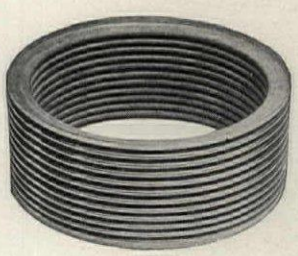
Engineering Achievements and the Perfect School House

Sylphon TRADE MARK Temperature CONTROL



Shown above are four Sylphon Regulators installed on storage tanks in the new Roosevelt School at Des Moines, Iowa. Sylphon Temperature Regulation is an important factor in maintaining an even school-room temperature, and in regulating the brine cooled drinking water system.

The Sylphon Bellows



All Sylphon Instruments, whether designed for the control of temperatures or pressures of air, liquids or gases, for the control of brine cooled refrigerating systems, or the maintenance of predetermined room temperatures, have as their motor element, *the original* and only genuine Sylphon Bellows. This, the most sensitive, flexible and durable expansion element known to science, was originated and patented by The Fulton Sylphon Company.

Specified for Many of the Nation's Finest School Buildings

MODERN engineering skill has given to America adequate heating plants, efficient ventilation, and brine cooled drinking water systems to keep pace with its thousands of splendid examples of school architecture.

Sylphon Temperature Control has contributed largely to these heating and refrigerating triumphs. In the Nation's *great hotels, industrial plants,—office buildings and hospitals too, Sylphon Temperature Regulators are performing, without supervision or repair, a service of highest dependability.*

Whether the job be large or small it will pay you to install Sylphon Instruments. You are invited to submit to our engineers (without obligation) problems involving the use of Slyphon Specialties.

Write for Bulletin AT-110 and AT-106

THE FULTON SYLPHON COMPANY
KNOXVILLE, TENNESSEE

Representatives in all Principal Cities in U. S. A.—European Representatives. Crosby Valve and Engineering Company, Ltd., 41-2 Foley St., London, W. 1. England—Canadian Representatives, Darling Bros., Ltd., 140 Prince St., Montreal, Que., Canada

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 196*

PAINTS, STAINS, VARNISHES and WOOD FINISHES—Continued

Protective Paints for Metal Surfaces. Bulletin No. 4, 8½ x 11 ins., 12 pp. Illustrated. A highly technical subject treated in a simple, understandable manner.

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.

Valentine & Co., 456 Fourth Ave., New York, N. Y.
How to Use Valspar. Illustrated booklet, 32 pp., 3¾ x 8 ins. Deals with domestic uses for Valspar.

How, to Keep Your House Young. Illustrated brochure, 24 pp., 7 x 8½ ins. A useful work on the upkeep of residences.

Architectural Four-Hour Varnishes and Enamels. Booklet, 8 pp., 4½ x 6 ins. Data on a useful line of materials.

PAPER

A. P. W. Paper Co., Albany, N. Y.
Here's a Towel Built for Its Job. Folder, 8 pp., 4 x 9 ins. Deals with "Onliwon" paper towels.

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 11¾ 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.

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.

Improved Office Partition Company, 25 Grand St., Elmhurst, L. I.
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.

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.

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.

PLASTER—Continued

Plasterers' Handbook. Booklet, 16 pp., 3½ x 5½ ins. A small manual for use of plasterers.

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.

Wolff Co., 2057 W. Fulton St., Chicago, Ill.
General Catalog. Bound volume. 8½ x 10½. Illustrated. A fine publication dealing with an excellent line of fixtures.
Modern and Ancient Luxury. Brochure. 24 pp. 5 x 7¾ ins. Illustrated. Fixtures for domestic use.

PUMPS

Kewanee Private Utilities Co., 442 Franklin St., Kewanee, Ill.
Bulletin E. 7¾ x 10¼ 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.

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.

Weil Pump Co., 215 W. Superior St., Chicago, Ill.
Pumps. Booklet, 8½ x 11 ins. Illustrated. Individual bulletins with specifications on sewage ejectors, and bilge, house, condensation, booster and boiler feed pumps.

RADIO EQUIPMENT

Radio Corporation of America, Woolworth Building, New York City, N. Y.
R. C. A. Antenna Distribution System for Multiple Receivers. Booklet, 16 pp., 8½ x 11 ins. Illustrated. Apparatus for apartment houses and similar large buildings.

R. C. A. Centralized Radio Receiving Equipment. Brochure, 8 pp., 9 x 11 ins. Illustrated. Radio equipment for hotels, hospitals, etc.

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.

REINFORCED CONCRETE—See also Construction, Concrete

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.

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.

Slammed up!—slammed down! stood on! Kicked!

Constant abuse is the lot of the public toilet seat. Constant expense for replacements is the result—*unless* you install seats so strong that they simply cannot be smashed.

Whale-bone-ite is such a seat. Though it costs no more than the cheapest composition closet seat made, its unbreakable construction—guaranteed for the life of the building—immediately ends all replacement expense.

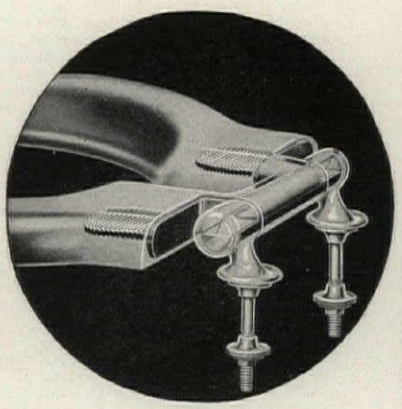
Its handsome polished Whale-bone-ite surface will last a lifetime. It is easy to clean and non-inflammable. Its hinge also is covered with Whale-bone-ite, giving it the same strong polished surface as the seat, and making it non-corrosive.

Its use is spreading to the guest bathrooms of fine hotels. Many new apartment houses are equipping all toilets with it.

Send for free cross-section —see its strength yourself

Figures show that on the average ordinary seats have to be replaced about every three years. If you want to end this needless expense, just as it already has been ended in more than a million public toilets in modern and remodelled buildings, simply install Whale-bone-ite Seats as fast as other seats wear out. Not only will the replacement expense end, but the toilets will be cleaner as Whale-bone-ite is easier to keep clean. Without obligation send for a free Whale-bone-ite cross-section. Simply address Dept. A-4, Seat Division, The Brunswick-Balke-Collender Co., 623 South Wabash Avenue, Chicago.

THE WHALE-BONE-ITE Seat and Hinge form an unbreakable unit. The seat is molded around a laminated core of alternating-grain layers of hardwood, making it proof against warping, cracking and splitting. The die-cast hinge is molded integral with the seat.



THE BRUNSWICK-BALKE-COLLENDER CO. · Chicago

Atlanta	Chicago	Detroit	Memphis	New York	Seattle
Birmingham	Cincinnati	El Paso	Minneapolis	Philadelphia	St. Louis
Boston	Cleveland	Harrisburg	Nashville	Pittsburgh	Tampa
Buffalo	Dallas	Houston	Newark	Richmond	Washington
Charlotte	Denver	Kansas City	New Haven	San Antonio	Montreal
Chattanooga	Des Moines	Los Angeles	New Orleans	San Francisco	Ottawa

Toronto Havana

BRUNSWICK WHALE-BONE-ITE TOILET SEATS

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 198*

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.
Federal Nailing Concrete Roof Slabs. Folder. 4 pp., 8½ x 11 ins. Illustrated.
Roof Standards. Booklet. 30 pp., 8½ x 11 ins. Illustrated.
Federal Interlocking Tile and Glass Tile. Folder. 4 pp., 8½ x 11 ins. Illustrated.
Federal Long-Spare Roof Slab. Folder. 4 pp., 8½ x 11 ins. Illustrated.
New Federal Light Six Roof Slab. Folder. 4 pp., 8½ x 11 ins. Illustrated.

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.

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.

SEWAGE DISPOSAL

Kewanee Private Utilities, 442 Franklin St., Kewanee, Ill.
Specification Sheets. 7¾ x 10¼ ins., 40 pp. Illustrated. Detailed drawings and specifications covering water supply and sewage disposal systems.

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.

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.

SOUND DEADENER

Cabot, Inc., Samuel, Boston, Mass.
Cabot's Deadening Quilt. Brochure, 7½ x 10½ ins., 28 pp. Illustrated. Gives complete data regarding a well-known protection against sound.

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.
Store Front Suggestions. Booklet, 96 pp., 6 x 8½ ins. Illustrated. Shows different types of Kawneer Solid Copper Store Fronts.
Catalog K. 1927 Edition. Booklet, 32 pp., 8½ x 11 ins. Illustrated. Details of Kawneer Copper Store Fronts.
Detail Sheets for Use in Tracing. Full-sized details on sheets 17 x 22 ins.
Kawneer Construction in Solid Bronze or Copper. Booklet, 64 pp., 8½ x 11 ins. Illustrated. Complete data on the subject.

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

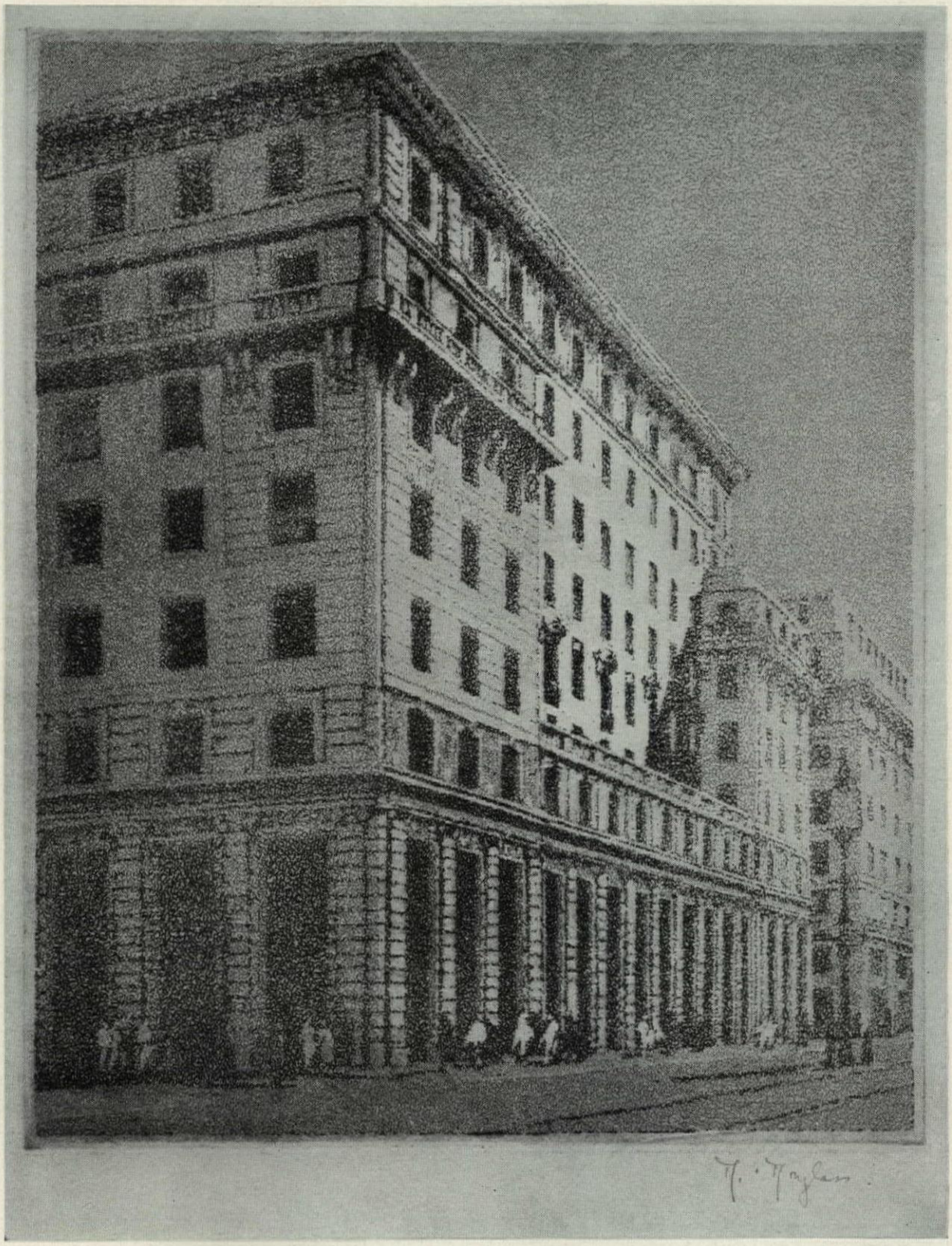
All Bell Telephone Companies. Apply nearest Business Office, or American Telephone and Telegraph Company, 195 Broadway, New York.
Planning for Home Telephone Conveniences. Booklet, 52 pp., 8½ x 11 inches. Illustrated.
Planning for Telephones in Buildings. Brochure, 74 pp., 8½ x 11 inches. Illustrated.

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 St., Pittsburgh, Pa.
Standard Wall Construction Bulletin 174. 8½ x 11 ins., 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.
Standard Fireproofing Bulletin 171. 8½ x 11 ins., 32 pp. Illustrated. A treatise on the subject of hollow tile as used for floors, girder, column and beam covering and similar construction.
Natco Double Shell Load Bearing Tile Bulletin. 8½ x 11 ins., 6 pp. Illustrated.
Natco Face Tile for the Up-to-Date. Farm Bulletin. 8½ x 11 ins.
Natcoflor Bulletin. 8½ x 11 ins., 6 pp. Illustrated.
Natco Header Backer Tile Bulletin. 8½ x 11 ins., 4 pp. Illustrated.
Natco Unibacker Tile Bulletin. 8½ x 11 ins., 4 pp. Illustrated.



SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 200*

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 12¾ 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 Bros., 80 White St., New York, N. Y.

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.

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.

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, 11 West 42nd Street, New York, N. Y.

Minwax Products. Booklet, 6 pp., 8½ x 11 ins. Illustrated.

Color Card—Flat Finish. Folder, 4 pp., 8½ x 11 ins. Illustrated. Deals with a penetrative, preservative stain finish, giving stain and a soft, wax effect.

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.

The Vortex Mfg. Co., 1978 West 77th St., Cleveland, Ohio.

Par-Lock Specification "Form D" for waterproofing surfaces to be finished with Portland cement or tile.

Par-Lock Specification "Forms E and G" membrane waterproofing of basements, tunnels, swimming pools, tanks to resist hydrostatic pressure.

Par-Lock Waterproofing. Specification Forms D. E, F and G. Sheets, 8½ x 11 ins. Data on combinations of gun-applied asphalt and cotton or felt membrane, built up to suit requirements.

Par-Lock Method of Bonding Plaster to Structural Surfaces. Folder, 6 pp., 8½ x 11 ins. Official Bulletin of Approved Products—Investigating Committees of Architects and Engineers.

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

The Kawneer Company, Niles, Mich.

Kawneer Solid Nickel Silver Windows. In casement and weight-hung types and in drop-down transom type. Portfolio, 12 pp., 9 x 11½ ins. Illustrated, and with demonstrator.

David Lupton's Sons Company, Philadelphia, Pa.

Lupton Pivoted Sash. Catalog 12-A. Booklet, 48 pp., 8⅝ x 11 ins. Illustrates and describes windows suitable for manufacturing buildings.

WINDOWS, CASEMENT

Crittall Casement Window Co., 10951 Hearn Ave., Detroit, Mich.

Catalog No. 22. 9 x 12 ins., 76 pp. Illustrated. Photographs of actual work accompanied by scale details for casements and composite steel windows for banks, office buildings, hospitals and residences.

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.

The Kawneer Company, Niles, Mich.

Kawneer Solid Nickel Silver Windows. In casement and weight-hung types and in drop-down transom type. Portfolio, 12 pp., 9 x 11½ ins. Illustrated, and with demonstrator.

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 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

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.

WINDOWS, STEEL AND BRONZE

David Lupton's Sons Company, Philadelphia, Pa.

A Rain-shed and Ventilator of Glass and Steel. Pamphlet, 4 pp., 8⅝ 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.

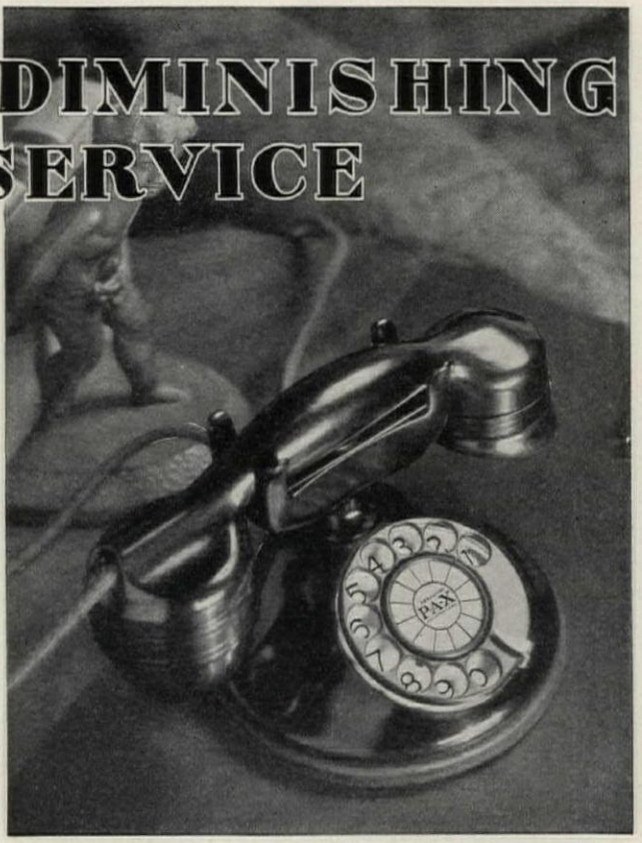
STROWGER P-A-X

Check These Features of Strowger P-A-X

Absolute Privacy
Special Services
24-Hour Service ✓
Unfailing Accuracy
Instantaneous Connections
Low Cost of Operation

These are the requirements of a perfect Interior Telephone System.

MAINTAINS UNDIMINISHING 24-HOUR SERVICE



Day or night—at every moment—Strowger P-A-X stands ready to render its duty as an automatic interior telephone system. No matter what exigency may arise, or what task of interior communication may be imposed, P-A-X responds with uniform accuracy and speed.

Strowger P-A-X is never "off duty". It is automatic—therefore requires no human intermediary to serve it. A simple turn or two of the Strowger dial—and P-A-X carries your message immediately and accurately to the proper person.

The makers of Strowger P-A-X are the originators and foremost manufacturers of automatic telephone systems for both public and private service. Strowger engineers will be glad to submit studies on any project in which telephone equipment is specified Strowger P-A-X Systems are available in any capacity from five lines and upwards.

STROWGER DIAL SYSTEMS INCLUDE:
Public Automatic Telephone Systems
Private Automatic Telephone Systems—(Strowger P-A-X)
Code Signal Systems — Watchman Supervisory Systems
Tele-Chec Systems (for theatres) — Industrial Fire Alarm Systems
Railway Signalling and Communication Equipment.

Engineered, Designed, and Manufactured by

Automatic Electric Inc.

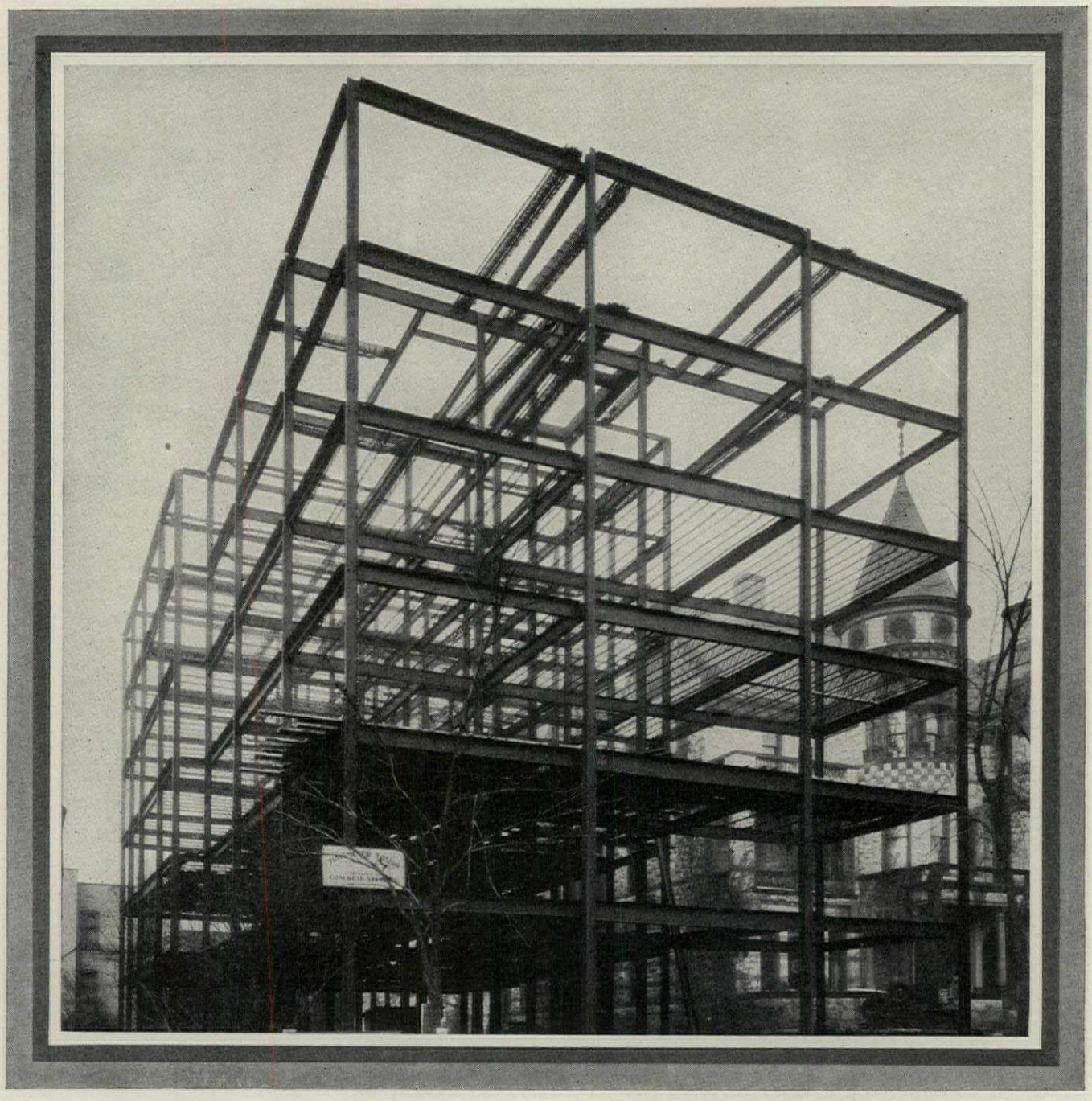
Factory and General Offices:
1033 West Van Buren St., Chicago, U. S. A.

Sales and Service Offices in the Following Cities:

Los Angeles	Cleveland	New York	Dallas	St. Louis
Boston	St. Paul	Atlanta	Detroit	Philadelphia

Export Distributors:
For Australasia—Automatic Telephones, Ltd.; Sydney.
For Canada—Independent Sales & Engineering Co., Ltd.; Vancouver.
Elsewhere—The Automatic Electric Company, Ltd.; Chicago.

STROWGER DIAL SYSTEMS



SPEED HAVEMEYER TRUSS

Up go the floors . . . Havemeyer Trusses laid without scaffolding . . . spaced and secured by common labor in an astonishingly few moments . . . and concrete poured without forms! This speed and ease of handling result in a finished concrete slab floor laid for an average cost of about two-thirds that of older, more cumbersome methods. And speed means saving of time — almost as important as saving of money.

Because of the demand for comprehensive data on the various uses of Havemeyer Trusses, Concrete Steel Company has produced a complete folio of 32 pages and 3 data sheets giving the most recent information. In requesting this book "Structural Economies for Concrete Floors and Roofs," please address Executive Offices.

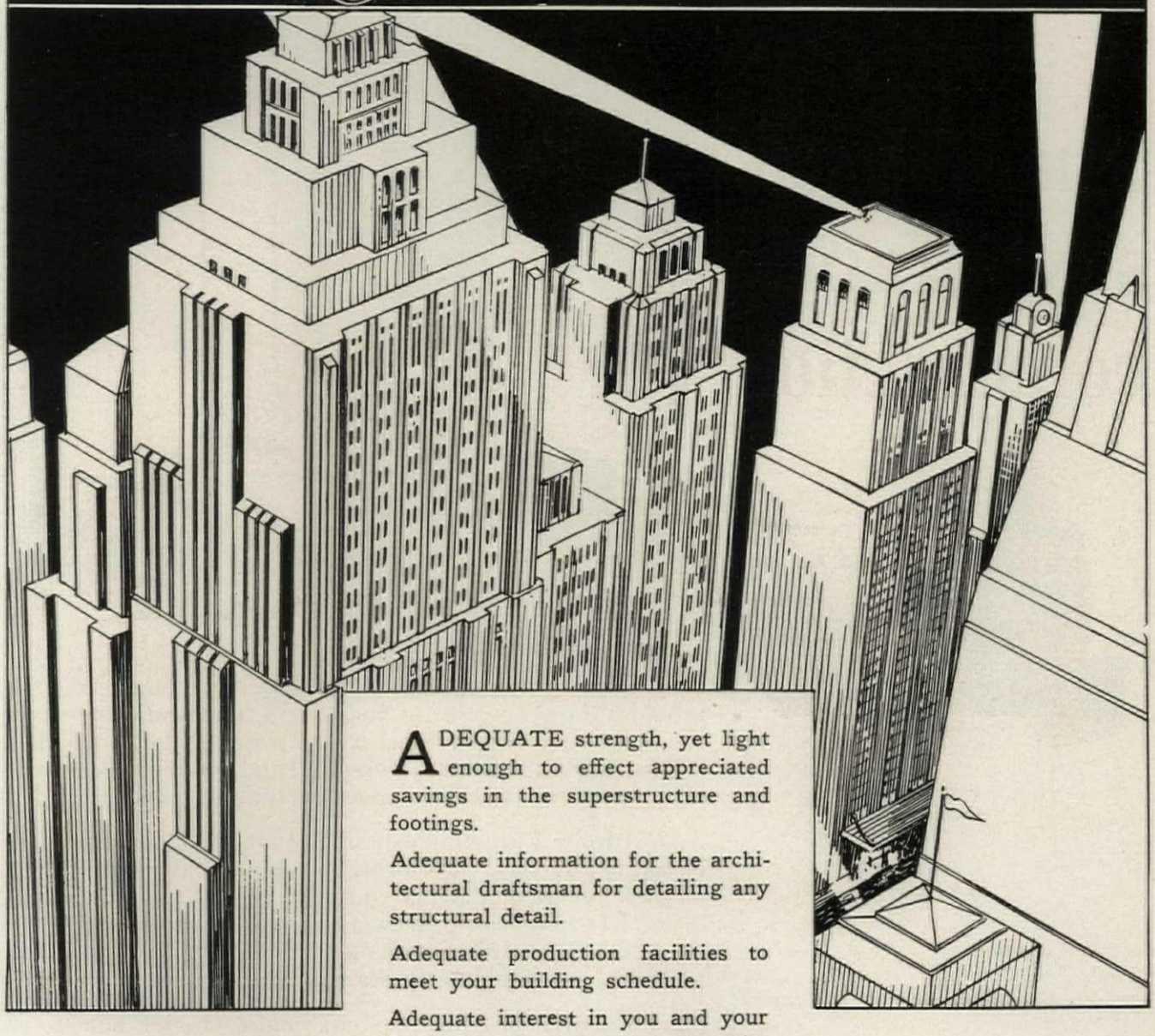
Executive Offices

Concrete Steel Co.

42 Broadway New York

DISTRICT OFFICES: *Birmingham, Boston, Chicago, Detroit, Milwaukee, Minneapolis, Philadelphia, Pittsburgh, St. Paul, Syracuse, Washington.*

For All Light Occupancy Structures



ADEQUATE strength, yet light enough to effect appreciated savings in the superstructure and footings.

Adequate information for the architectural draftsman for detailing any structural detail.

Adequate production facilities to meet your building schedule.

Adequate interest in you and your future business to see that your joist jobs move smoothly and with a minimum amount of your time.

BRANCHES

Boston	Minneapolis
Chicago	New York
Dallas	Philadelphia
Detroit	Pittsburgh
Jacksonville	Roanoke
Kansas City	San Francisco
Los Angeles	St. Louis

Export Dept.—Canton, Ohio

THE BERGER MFG. CO.
CANTON, OHIO

METAL LUMBER AND BAR JOISTS. METAL LATH AND PLASTERING COMMODITIES.

BERLOY STEEL JOISTS

Make permanent beauty part of your specifications . . .

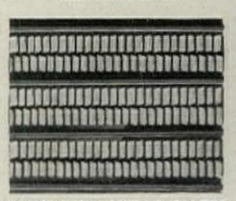
MILCOR

STAY-RIB METAL LATH
EXPANSION CORNER BEAD

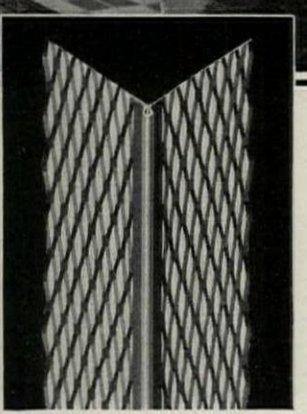
THE many structural advantages of *Milcor* Products achieve permanent beauty in home construction. In its design *Milcor* Stay-Rib Metal Lath is unique in its unusual rigidity and strength. It provides fire safeness and assures maximum protection against cracking. The expanded metal wings which distinguish *Milcor* Expansion Corner Bead and Casing from all other similar products, allows the keying of the plaster right to the actual corner—eliminating the danger of the plaster checking off or cracking . . . Complete details and recommended specifications are contained in the "*Milcor* Manual". We will gladly send you a copy for your file.

MILWAUKEE CORRUGATING COMPANY
1405 Burnham Street, Milwaukee, Wisconsin
Branches: Chicago, Ill., Kansas City, Mo., La Crosse, Wis.
Sales Offices: Boston, Mass., Detroit, Mich., Atlanta, Ga.
Little Rock, Ark., Minneapolis, Minn.
Eastern Plant: **The Eller Manufacturing Co., Canton, Ohio.**

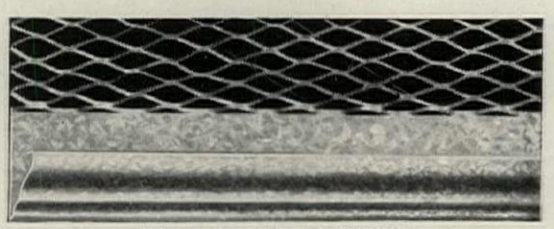
Specifications for every home, large or small, should include these three Milcor products . . . Expansion Corner Bead for arches and corners . . . Stay-Rib Metal Lath for better plastering . . and Expansion Metal Casing for windows and doors. Write for more information.



STAY-RIB METAL LATH



EXPANSION CORNER BEAD



EXPANSION METAL CASING

MILCOR PRODUCTS

FOR FINER CONSTRUCTION

In BUFFALO

New York Central Railroad Company Central Passenger Station

Rand Building
Marine Trust Company

These four structures, like many other Buffalo buildings, have Bethlehem Wide-Flange Structural Shapes—generally known as Bethlehem Sections — in their steel framework.

The light weight of Bethlehem Sections and their economy in cost of fabrication and erection have led to their extensive adoption by architects, engineers and contractors.

Thousands of structures, the world over, have Bethlehem Sections in their steel framework.

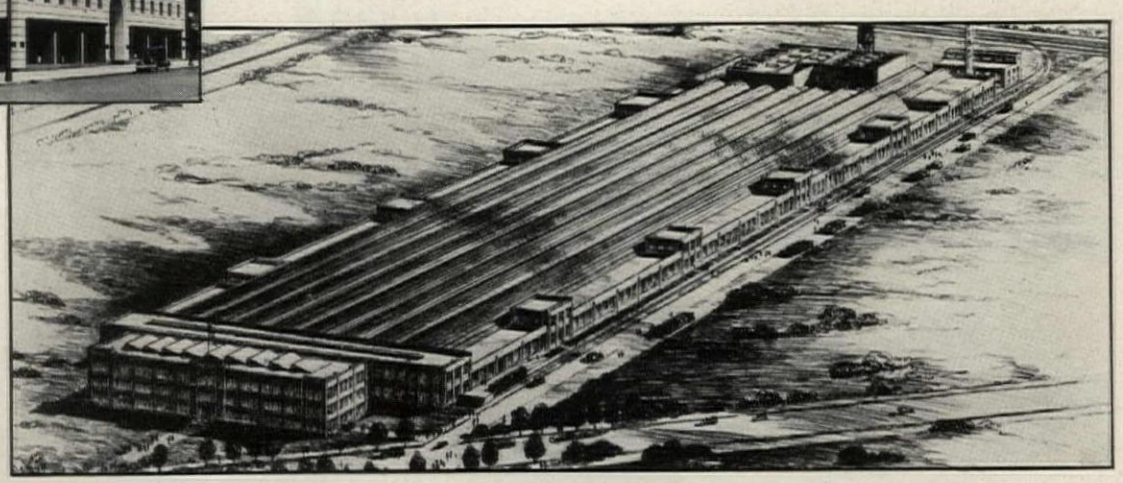
BETHLEHEM STEEL COMPANY

General Offices: Bethlehem, Pa.

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Detroit, Cincinnati, Chicago, St. Louis, Seattle, San Francisco, Los Angeles, Portland, Honolulu.

Bethlehem Steel Export Corporation, New York
Sole Exporter of our Commercial Products

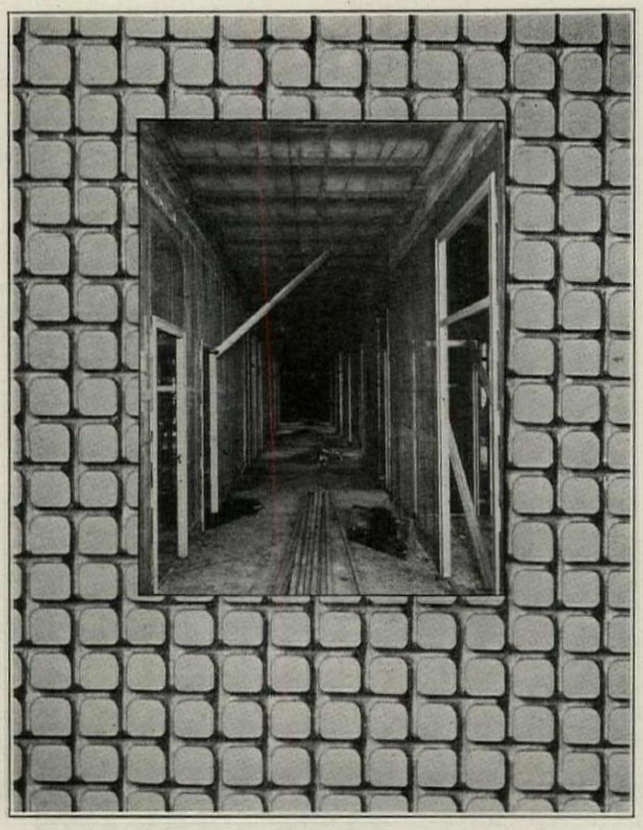
Above:
Victor and Company Building



Right:
Curtiss Aeroplane and Motor Company Plant

BETHLEHEM

Wide-flange STRUCTURAL SHAPES



Where Clinton Lath is More than Lath

In the Charity Hospital in Cleveland, O., Clinton Wire Lath was used to serve as re-enforcement as well as lath in constructing the two-inch non-bearing partitions.

The door frames were set instead of bucks and grounds. A single layer of lath was erected on the centre line of the partitions. Then the plaster applied first on one side and then on the other. Clinton Wire Lath is made of finely tempered wire woven with a close, even mesh. A double key, both vertical and horizontal, is provided irrespective of the direction of the stroke used in plastering. It may be had black painted, made of galvanized wire or hot dipped galvanized after the fabric is woven.

Progressive builders have found many uses for Clinton Wire Lath other than lath. It stands up. They can trust it.

Let us send you complete information.

WICKWIRE SPENCER STEEL COMPANY
41 East 42nd Street, New York, N. Y.

Worcester	Chicago	Los Angeles
Buffalo	Atlanta	Seattle
Cleveland	San Francisco	Portland

Architect—The George S. Rider Co.
Contractor—The Lundoof-Bickwell Co.
Plasterer—The Lennox Halderman Co.

WICKWIRE SPENCER STEEL

CLINTON WIRE LATH

THE CUTLER MAIL CHUTE

In its perfected form is the outcome of long experience, and is designed to meet the requirements of public use under Postoffice Regulation. It is simple and substantial in design and construction, durable in finish, and has an Architectural quality which is appreciated and much commended by Architects.

Full information, details, and specifications on request.

THE CUTLER MAIL CHUTE CO.
GENERAL OFFICES AND FACTORY
ROCHESTER, N.Y.

KNO-BURN, JR.

Small Mesh

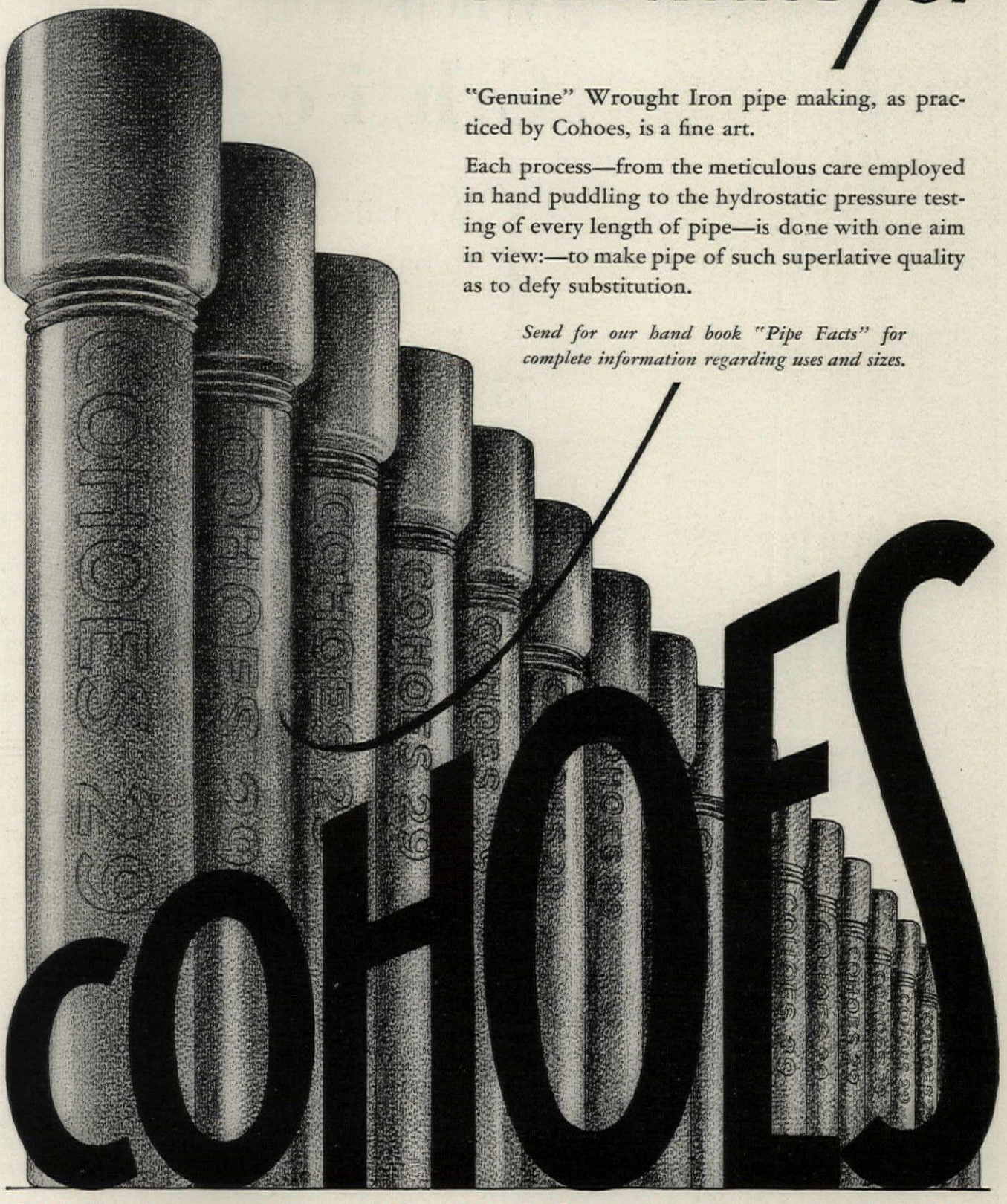
METAL LATH

"Makes Good Plastering Cost Less"

Sample and Circular Gladly Sent

NORTH WESTERN EXPANDED METAL CO.
1234 Old Colony Bldg.
CHICAGO

There is no substitute for



"Genuine" Wrought Iron pipe making, as practiced by Cohoes, is a fine art.

Each process—from the meticulous care employed in hand puddling to the hydrostatic pressure testing of every length of pipe—is done with one aim in view:—to make pipe of such superlative quality as to defy substitution.

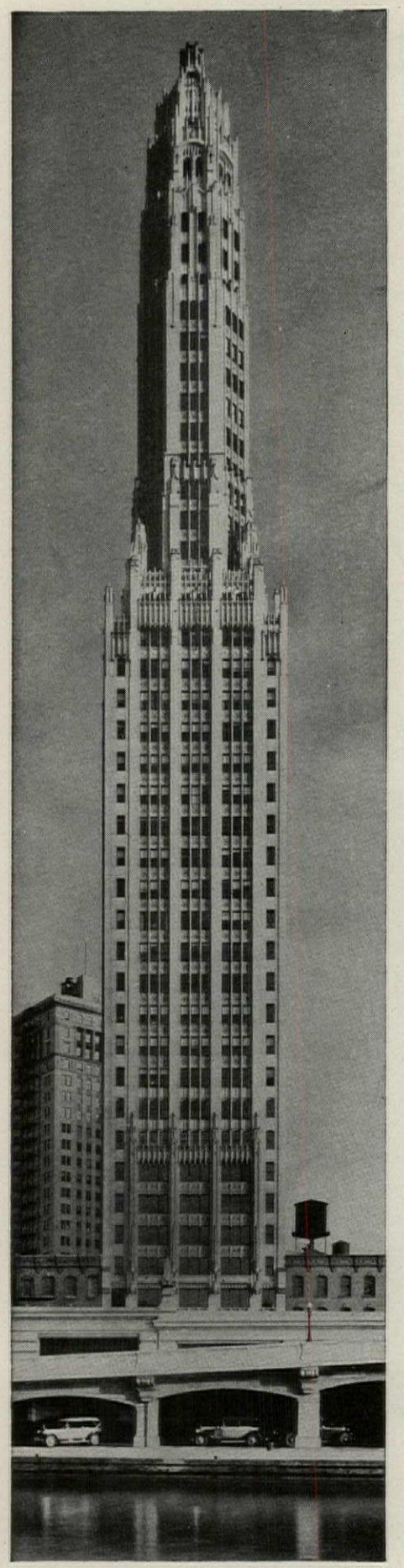
Send for our hand book "Pipe Facts" for complete information regarding uses and sizes.

Old Fashioned Hand Puddled Genuine Wrought Iron Pipe

COHOES ROLLING MILL CO.

COHOES, NEW YORK

BRANCH OFFICES: **NEW YORK-CHICAGO-LOS ANGELES-SEATTLE-PORTLAND-BOSTON CLEVELAND-DETROIT-NORFOLK-MINNEAPOLIS**



When You Are In Chicago

We will be delighted to have you call at our new offices

75 East Wacker Drive

MATHER TOWER BUILDING

THE ARCHITECTURAL FORUM is pleased to announce that its mid-western staff is now located in new offices in the Mather Tower Building, 75 East Wacker Drive, Chicago, Ill. Together with the staffs of the other fifteen publications which make up NATIONAL TRADE JOURNALS, INC., they are now occupying the entire sixth floor of this beautiful new structure. With all modern facilities now available to make for prompt and efficient service, the members of THE ARCHITECTURAL FORUM staff extend a cordial invitation to all their friends to call.

If visitors wish to make our offices their business headquarters while in Chicago, they will be furnished a private office for conferences and with stenographic, telegraphic and mail service to suit their requirements. Delivery of telegrams and mail will receive most careful attention.

As now organized, there are four groups, and a nucleus for a fifth, making up NATIONAL TRADE JOURNALS, INC., each group having their respective staff in these offices. These groups are: National Building Publications; National Food Products Publications; National Diesel Publications; National Sports Publications; and a National Textile Publication. Specialty Salesman Magazine is also a property of NATIONAL TRADE JOURNALS, INC.

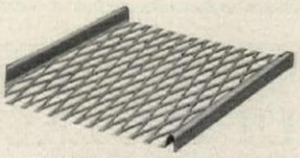
The magazines of NATIONAL BUILDING PUBLICATIONS are: THE ARCHITECTURAL FORUM, BUILDING AGE, HOME BUILDERS' CATALOG, GOOD FURNITURE MAGAZINE, THE HEATING & VENTILATING MAGAZINE.

Mather Tower Building is conveniently located for business visitors to Chicago. THE ARCHITECTURAL FORUM staff will welcome the opportunity to serve you when you are in Chicago.

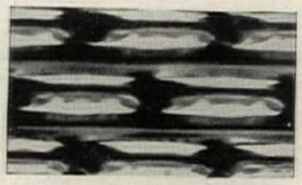
What About the Core?

To be good and sound, for long keeping, an apple must have a healthy core. The buildings of tomorrow demand this same qualification — and the metal lath you specify for wall, ceiling and concrete floor construction must be of the highest grade. Kalman offers you an unusually high-quality line of metal lath to choose from. Specifying any one of them will give you the permanency that is demanded in improved, fire-safe construction.

KALMAN STEEL COMPANY



3/8" Rib Kalmanlath



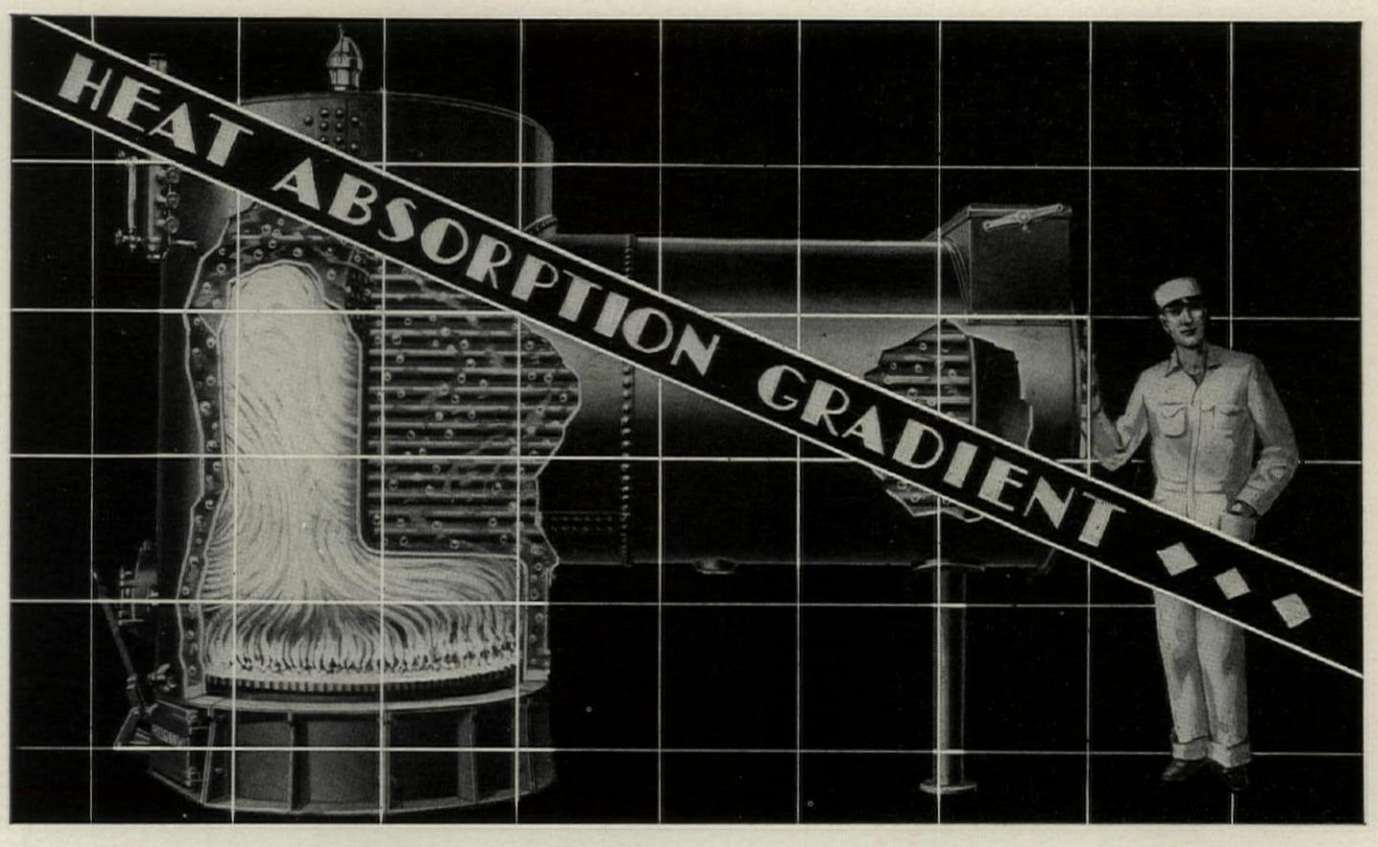
Troff Kalmanlath

Cup Kalmanlath

KALMAN STEEL

MODERN, FIRE-SAFE BUILDING PRODUCTS

Atlanta, Baltimore, Boston, Charlotte, Chicago, Columbus, Buffalo, Detroit, Houston, Kansas City, Dayton, Milwaukee, Minneapolis, Newark, New York (Export Office—New York), New Haven, Niles, Philadelphia, Pittsburgh, St. Paul, Syracuse, Youngstown, Washington, D.C.



HIGH IN HEAT TRANSFER

WALK into the boiler room of any big building where Fitzgibbons steel boilers are giving, day and night, year 'round fuel saving service.

Look in the combustion chamber—an even spread of intense glowing heat. The temperature is at the maximum in that fiery vault. Now walk to the other end of the Fitzgibbons Boiler—lay your hand on the rear flue door—you can rest it there. Open the flue doors. Still no great heat. What more simple and convincing evidence of the high heat transfer of Fitzgibbons Steel Boilers? The heat has been absorbed by the water.

Fitzgibbons Steel Boilers are of distinctive design to secure maximum heat transfer. Of multiple fire tube single flue pass design they are quick steaming. They have repeatedly demonstrated fuel savings of 20% to 40%. Their maintenance cost is nil.

Available in any size from 300 sq. ft. to 36,000 sq. ft. steam rating, they come to the job complete, tight, set-up, ready for service. Minimum installation costs and maximum fuel economy make Fitzgibbons Boilers the first choice of both architect and engineer.

FITZGIBBONS BOILER COMPANY
570 SEVENTH AVENUE, NEW YORK CITY
Works: Oswego, N. Y.

BRANCHES AND REPRESENTATIVES

Baltimore
Boston
Bridgeport
Buffalo
Detroit
Louisville
Pittsburgh
Pittsfield

FITZGIBBONS STEEL BOILERS

BRANCHES AND REPRESENTATIVES

Philadelphia
Reading
Richmond
Rochester
San Antonio
Syracuse
Winston-Salem

Places . . . .

tect and contractor. A nominal rental charge based on continued re-use of the sturdy steel forms covers installation and removal.

You are invited to ask a representative to call and show you how Meyer Steelforms will help you to realize a construction that does full justice to your plans.

CONCRETE ENGINEERING COMPANY
General Offices: Omaha, Nebraska
Sales Offices and Warehouses:
Chicago Detroit Milwaukee Minneapolis Des Moines
Kansas City St. Louis Dallas Houston San Antonio
Oklahoma City Los Angeles Pittsburgh San Francisco

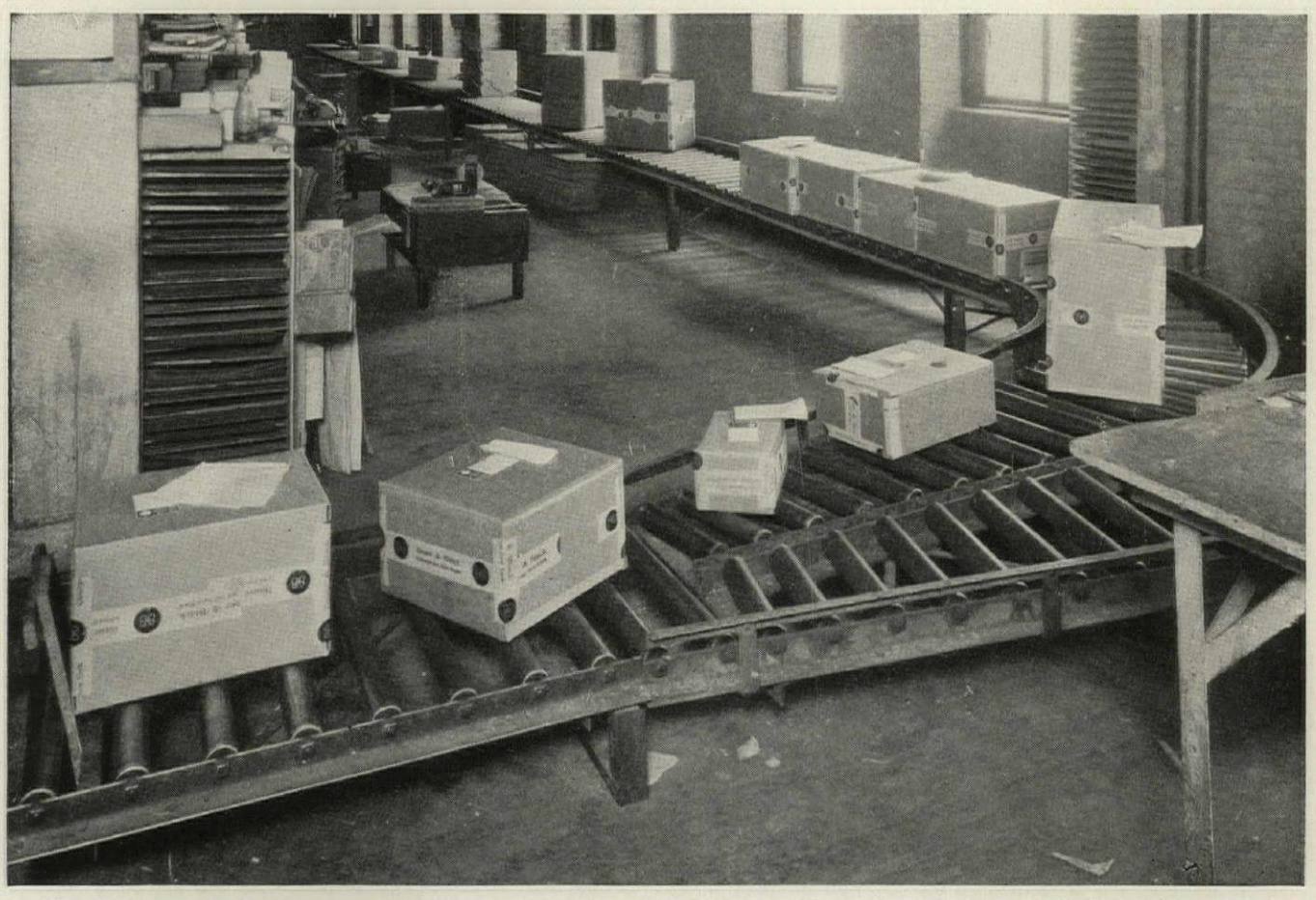
REINFORCED CONCRETE
Economical-Enduring

MERCHANDISE MART, CHICAGO
Architects:
Graham, Anderson, Probst & White, Chicago
Contractors:
John Griffiths & Son Co., Chicago

MEYER
Steelforms
THE STANDARD

FOR CONCRETE RIB FLOOR CONSTRUCTION

Foresight in Industrial Building Shown by Architectural Engineers has been responsible for New Production Economies



ARCHITECTURAL Engineers have given detailed study to manufacturers' handling problems and have been of invaluable assistance in effecting production economies by including Standard Conveyor Systems in building plans.

In one industry nine men performed the same amount of work in one-third the time formerly required by twenty-two men after Standard Conveyors had been included in the building plans. In other industries similar results were obtained due to the foresight of Architectural Engineers in planning new buildings or redesigning old ones.

Because of comprehensive experience in designing conveying systems for every type of handling, our Conveyor Counselors can be of valuable assistance to Architectural Engineers. This cooperation on the part of our Conveyor Counselors is being taken advantage of and is available at any time.

STANDARD
CONVEYOR COMPANY

NORTH ST. PAUL, MINNESOTA

Baltimore Office, 2125 Lyndhurst Avenue
Boston Office, 755 Boylston Street
Buffalo Office, 908 Ellicott Square
Chicago, Ill., 549 West Washington Street
Cincinnati Office, 609 American Bldg.
Cleveland Office, 5005 Euclid Avenue
Dallas Office, 6313 Oram Street
Detroit Office, 420 U. S. Mortgage Bldg.
Kansas City Office, 215 Manufacturers Exchange Bldg.
Los Angeles Office, 335 South San Pedro Street
New Orleans Office, 1003 Magazine Street
New York City Office, 420 Lexington Avenue
San Francisco Office, 4401 San Bruno Avenue
Seattle Office, 321 Lumber Exchange Bldg.

ATLANTIC CITY
CONVENTION HALL
Atlantic City, N. J.

Architects & Engineers:
Lockwood Greene Co., Inc.
Boston

General Contractors:
M. B. Markland Company
Atlantic City

Erected under direction of the Department of Streets and Public Improvements.

Dens-tect applied on interior of exterior walls above grade (149,000 sq. ft.), Par-Lock on all concrete surfaces plastered direct (90,000 sq. ft.).

A New Wall Treatment and Key That Supplants Furring

(Developed by the Par-Lock People)

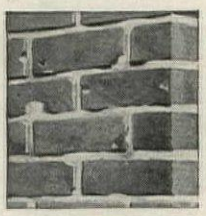
ATLANTIC CITY'S splendid new auditorium, fronting on the wind-swept ocean, has an interior wall protection in keeping with its drastic needs and its structural perfection. On ceilings the long tested Par-Lock plaster key is used and the new wall treatment developed by the Par-Lock People is used on the interior of the exterior walls.

This is *Dens-tect* —a new gun applied wall treatment that offers an impervious coating of tangible thickness. It fills every joint in the masonry and can be built out to afford lasting resistance to moisture.

The *Dens-tect* system comprises a gun applied priming coat of asphalt, followed by a coating of asphalt and a finely graded aggregate thoroughly mixed at the nozzle, building itself into a dense, protective coating of substantial thickness.

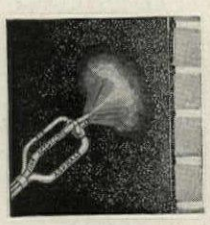
Dens-tect may be specified with complete assurance as a wall treatment and plaster base for the interior of exterior walls, and for light waterproofing in exterior applications below the grade line.

For complete information and quotation, get in touch with the nearest Par-Lock Applier—assuring expert, interested and responsible application of

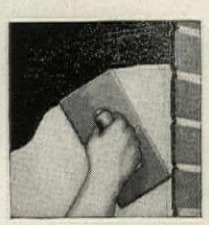


MASONRY WALL

ASPHALT PRIMER



BUILT-UP COAT



PROTECTED PLASTER

Dens-tect

TRADE-MARK

Protects Plaster

THE VORTEX MANUFACTURING CO. · *1984 W. 77th St., Cleveland*

Preserving the impressive beauty of the Indiana World War Memorial

with 92 Josam Drains

DRIPPING water can discolor the most beautiful building in the world. It can deteriorate the strongest structure. Drip . . . . drip . . . . just dripping water.

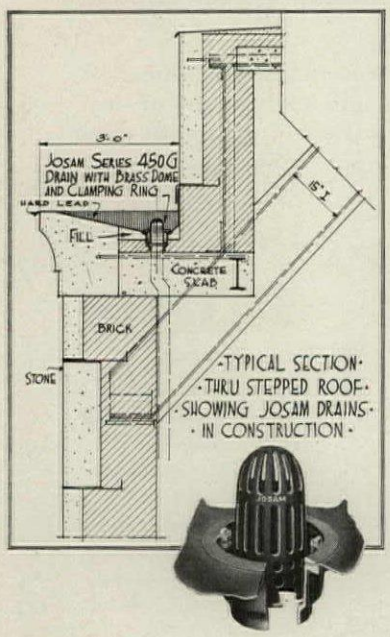
But the Indiana World War Memorial is protected against the ravaging hand of the elements because Josam Drains are placed on all stairway landings, on the promenade, on the set-back steps of the roof.

Thus the rain will leave no ugly streaks, no tell-tale marks. The moisture will find no place to collect and freeze.

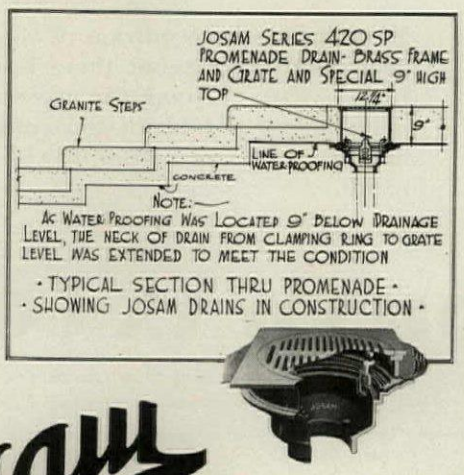
Josam Drains are not only installed in some of the most outstanding structures of the country but are placed throughout in the most strategic points of the buildings—often where no one ever thought of placing drains—*yet at points where they definitely filled a need.*

Josam Drains have behind them the engineering experience of 35 years, the enthusiasm of an organization that never stops trying, the curiosity of the inventor that leads them on and on in developing new products, in bettering their present line even though they are already looked upon as leaders in the field.

The Indiana World War Memorial—Indianapolis, Indiana
Walker & Weeks, Architects—Cleveland
Hunkin-Conkey Construction Company, General Contractors—Cleveland
Freyn Brothers, Plumbers—Indianapolis, Indiana



Let Josam engineers work with you on the drain problem of your next structure. Catalog G contains between two covers the result of the Josam background and experience. Write for a copy.



The Josam Mfg. Co.
4907 Euclid Building, Cleveland, O.
Factory: **Michigan City, Indiana**
Branches in Principal Cities

SEE OUR CATALOGUE IN SWEETS

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

Josam TRADE MARK REG. PRODUCTS

The Josam Line Includes: Josam Drains, Josam-Marsh Grease, Plaster and Hair Interceptors, Josam-Graver Garbage Incinerator, Josam Swimming Pool Equipment, Josam Open Seat Swing Check Valves, Josam Open Seat Back Water Sewer Valves, and Josam Closet Fittings and Bends with Test Caps.

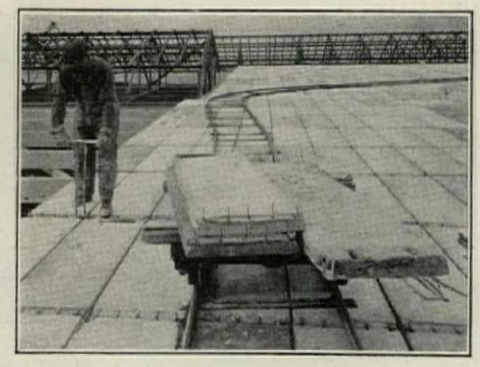
THERE ARE NO SUBSTITUTES FOR JOSAM PRODUCTS

WORLD'S LARGEST SINGLE SPAN ROOF

Decked With GYPSTEEL Pre-Cast Gypsum Slabs

THE entire roof of the Atlantic City Convention Hall, is decked with Gypsteel Pre-Cast Long Span Gypsum Slabs. The auditorium roof, alone, has an area of 170,000 square feet. It is about 500 feet long, and has a clear span of 350 feet.

Lockwood, Green & Co., the engineers, used the Gypsteel System on this roof because they had used it before and knew its qualifications. They knew it was fireproof. They knew its light weight meant economies in steel. They knew that no scaffolding or false work would be required. They knew that there would be practically no heat loss in winter—that the saving in heating cost, over other roofs, would amount to from $1.50 to $3.50, for each 100 square feet of roof. They knew that there would be no maintenance or upkeep costs.



Method of tying Gypsteel Roof Slabs to give roof definite, computable, structural strength

There were no delays in the Gypsteel installation over this vast area of roof. The roof progressed as rapidly as the steel was in place. Work went on regardless of temperature, as Gypsteel roofs can be laid in any weather in which men can work.

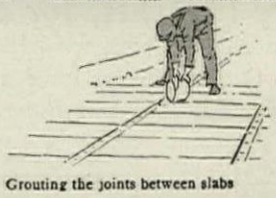
Additional information on the Gypsteel Pre-Cast Roof and information on the Gypsteel Pre-Cast Gypsum Floor System and Gypsteel Partition Tile, will be found on Page A-178 of Sweet's Catalogue. Our complete Catalogue with designing details, will be sent on request.

The Convention Hall at Atlantic City has a roof area of 220,000 square feet. The roof deck is of Gypsteel Pre-Cast Gypsum Slabs. Lockwood, Green & Co., *Engineers*

GYPSTEEL

Laying a Gypsteel slab

Tying the reinforcement



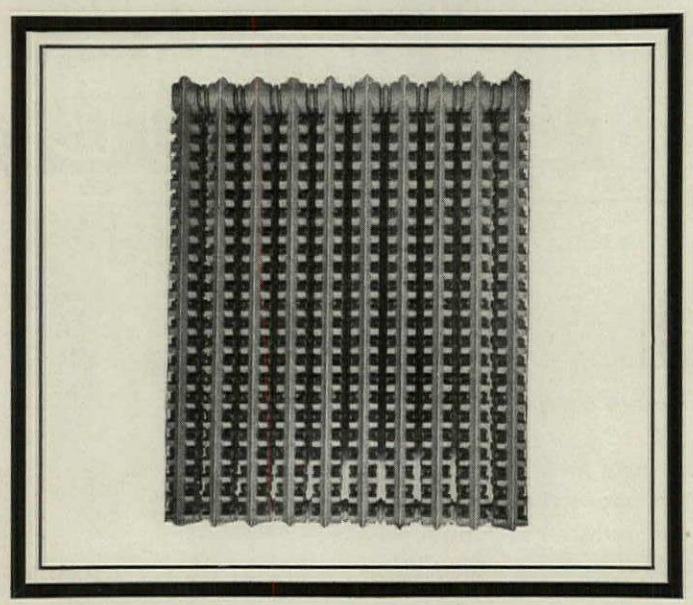
Grouting the joints between slabs

General Offices: Linden, N. J.

STRUCTURAL GYPSUM CORPORATION

Sales Offices in Principal Cities

VENTO
CAST IRON HEATERS



TWO TYPES
HEATING

FOR over 25 years Vento Cast Iron Heaters have been the leading choice of the world's heating and ventilating engineers—and for over 25 years Vento has maintained a perfect record, for there is not one known instance of failure.

There are reasons for Vento's outstanding success. The superior grade of cast iron from which Vento is cast gives this heating surface an unlimited life. It will not rust or laminate under the action of air, gas, water, or summer dampness. The unique design and construction of Vento insures rapid circulation of steam and breaks up air currents so that the entire surface of the Heater gives full heating efficiency.

Write today for engineering data and catalog.

AMERICAN RADIATOR COMPANY

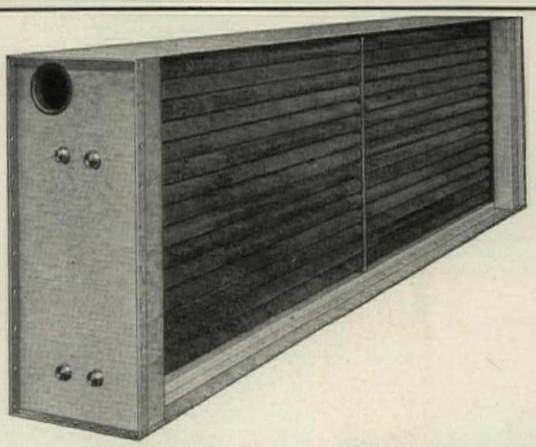
816 So. Michigan Avenue
Chicago

BRANCHES IN ALL

ARCOBLAST

ENCASED SECTIONS

OF INDIRECT SURFACE



For Central Fan and Plenum Chamber Work

THE Arcoblast encased section pictured above is especially designed for central fan and plenum chamber work, and is recommended when building construction will not permit the use of the heavier cast iron Vento surfaces.

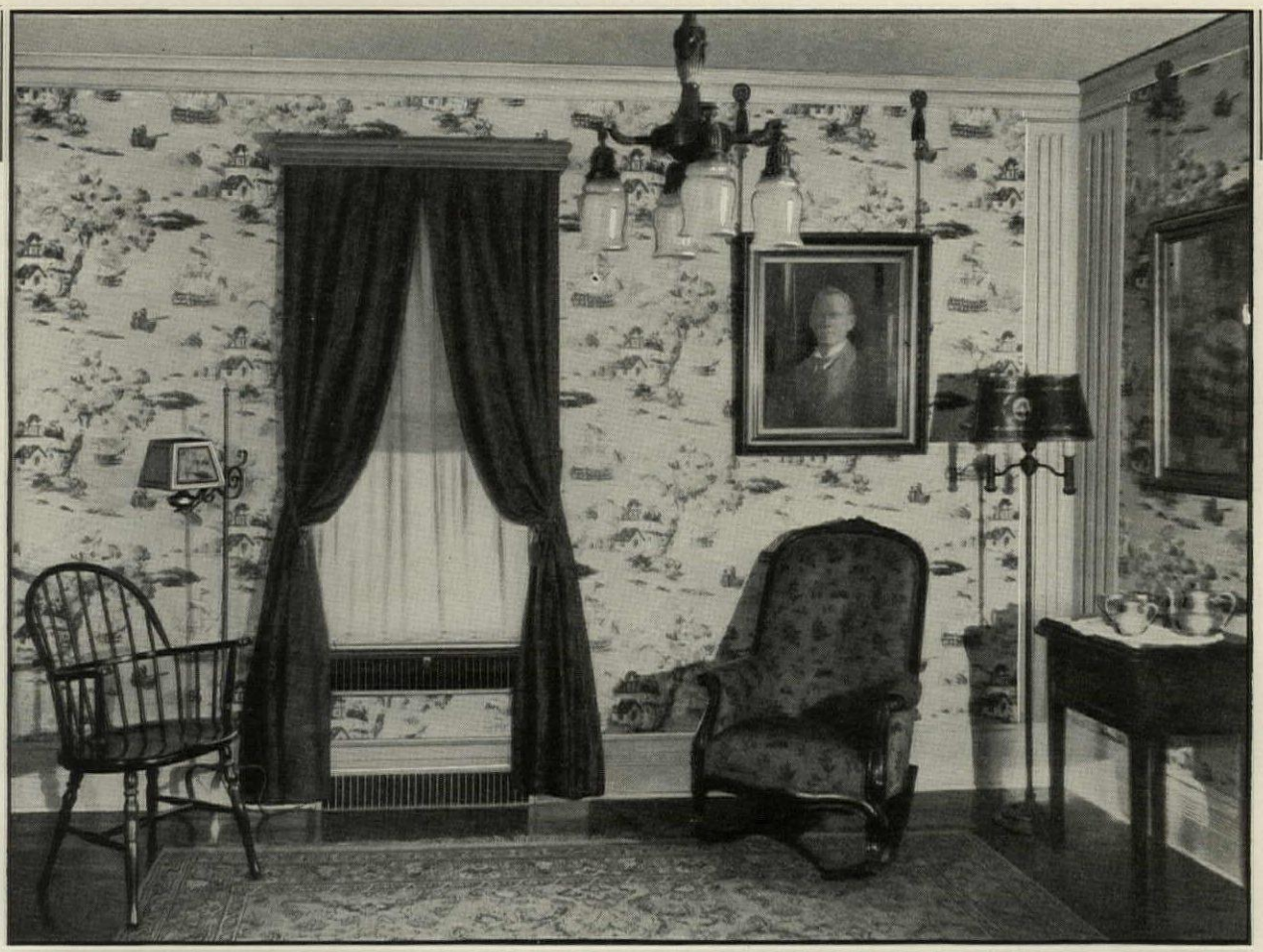
The encased Arcoblast is built on the same engineering principles and design used in the construction of Arcoblast surface for Unit Heaters. Many thousands of these Heaters are now in operation and their performance as well as their endorsement by leading Unit Heater manufacturers offers convincing proof of their success.

Write today for catalog giving complete information and all engineering data.

PRINCIPAL CITIES

AMERICAN RADIATOR COMPANY

40 W. 40th Street
New York



Trane Concealed Heaters offer the Ultimate in Heating Style and Efficiency

Concentration of efforts in the development of a fool-proof and efficient heating element has placed Trane Concealed Heaters on the highest plane of home heating science. They not only provide a most practical method of heating homes but answer the modern demand for beauty. Made to harmonize with the interiors, they permit any decorative scheme to be used without the hindrance of unsightly and awkward radiators.

Trane Heating Systems are complete in every detail with exception of the boiler and piping. Installation is simple — it's a one man job. A removable section in the baseboard gives complete accessibility for cleaning and inspection should it ever be necessary.

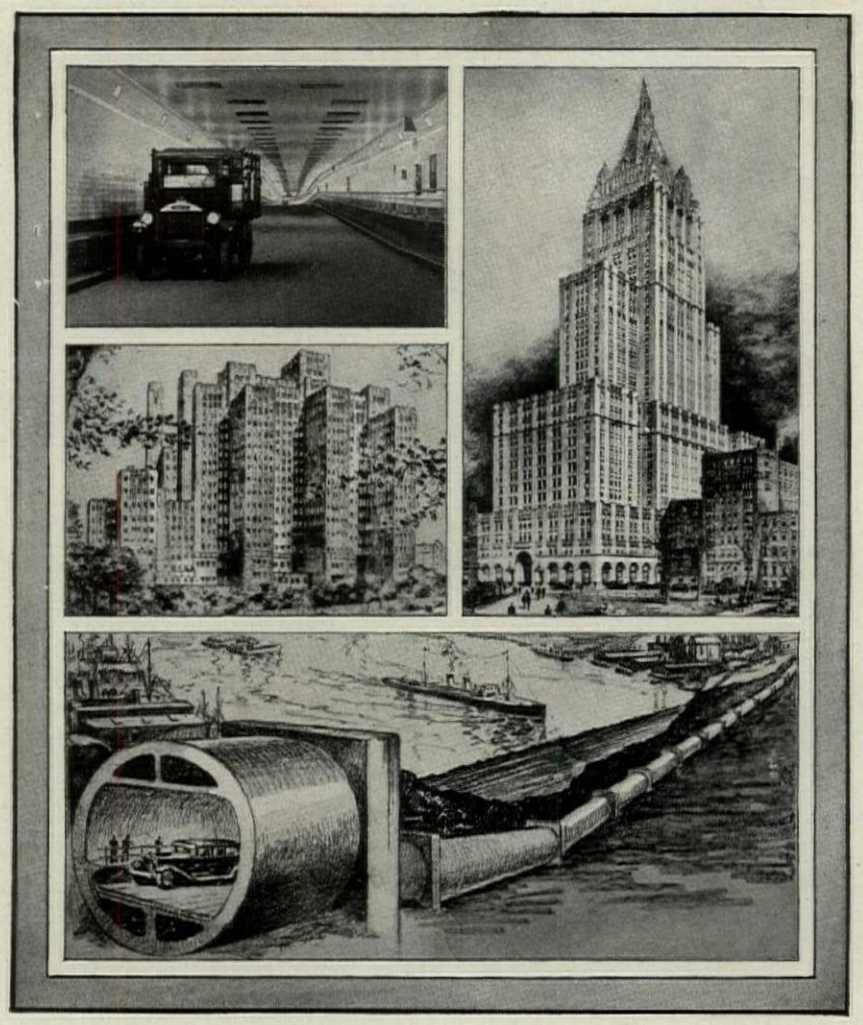
The same high standards of quality and efficiency apply to all Trane Heating Specialties. Trane Bellows-Packless Valves are positively sealed against leakage of steam under pressure, and the entrance of air into systems operating under vacuum. Trane Bellows Traps with balanced pressures are quick acting, giving free flow to condensate but closing rapidly against steam. Trane Specialties are rigidly tested under typical working conditions before leaving the plant.

You can recommend a Trane Concealed Heating System with assurance that it will give satisfaction in every respect. We will gladly furnish you complete details.

THE TRANE CO., LA CROSSE, WIS.
In Canada: The Trane Co. of Can., Ltd., Toronto, 2, Ontario

HEAT CABINETS **TRANE** CONCEALED HEATERS
PUMPS, UNIT HEATERS, AND HEATING SPECIALTIES

THE TRANE CO., Dept. 6,
220 Cameron Ave., La Crosse, Wis.
Send free booklet on the new style in heating
Name_____
Address_____



Inside the Holland Tunnel under the Hudson River.

The Presbyterian Hospital, New York City.

The New York Life Building, New York City.

The George A. Posey Tube, linking Oakland and Alameda, California.

Four Classics of Ventilating Science

. . . . *and initiative!*

. . . The Holland Tunnel with its specially built giant fans handling 1400 tons of air per minute;

. . . The Presbyterian Hospital, New York, one of the most modern—and exacting—heating and ventilating achievements. 369,000 cubic feet of outdoor air, properly tempered, supplied every minute;

. . . The New York Life Building where one million cubic feet of air is supplied every minute to an army of workers;

. . . The George A. Posey Tube linking Oakland and Alameda, California,—flooded with 80 tons of pure air every minute—unfailingly!

It is significant that Sturtevant equipment was the choice of the Architects and Engineers for all of these striking examples of American constructional genius . . . But the reason that the name "Sturtevant" is linked with these great enterprises is because of the superior operating characteristics of Sturtevant ventilating equipment!

It would be a pleasure to send you the Catalogs which describe in detail the Fans, Turbines or other equipment operating in the above mentioned tunnels and buildings. Please address our nearest Branch office.

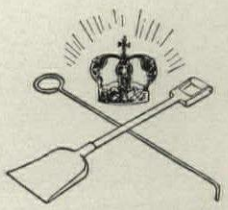
B. F. STURTEVANT COMPANY

Plants and Offices at: Berkeley, Cal., Camden, N. J., Framingham, Mass., Galt, Ontario., Hyde Park, Mass., Sturtevant, Wis. *Canadian Representative*: Kipp Kelly, Ltd., Winnipeg, *also Branches in Principal Cities and Agents in Foreign Countries.*

Sturtevant

REG. U.S. PAT. OFF.

HEATING-VENTILATING AND POWER PLANT EQUIPMENT



HIS MAJESTY, THE JANITOR

In Beaufort Gardens, the magnificent new apartment building in Mt. Vernon, Mr. August Stolz, owner, says that he installed Spencer Magazine Feed Heaters, for the lowest cost heat he could buy—heat and hot water the year 'round at less than nine cents a day for each family.

. . . has the Architect made him so lazy?

"I am a superintendent of a thirty-six (36) family house with a.....boiler, and find it does not give service as it should. Have heard of your Spencer Steam Boilers being so good and would be thankful to you if you would let me know of a place with your boiler in it that needs a Superintendent."

THAT'S a letter that came in one morning, as a regular part of the daily mail. There are more like it in the files.

Maybe janitors are lazy. Maybe the architect who specifies Spencer Heaters helps to make them more lazy—but it is a historical fact that lazy men, seeking an easier way to do work, are responsible for most of the short cuts and time-savers in industry today.

A Spencer Heater is a time-saver. Its automatic Magazine Feed does away with the night fireman. A superintendent gives it attention only once or twice a day. It does save the time of an apartment house superintendent, and he can use that time for other duties.

That's just one part of the saving that a Spencer makes. It is built, whether in the cast iron sectional or steel tubular type, with the sloping Gable-Grate exclusive in Spencer Heaters. This is the grate that lets fire burn up-hill, and fuel roll down. This fire that burns up-hill burns small sizes of fuel without blowers, without mechanical apparatus, and without any outside power.

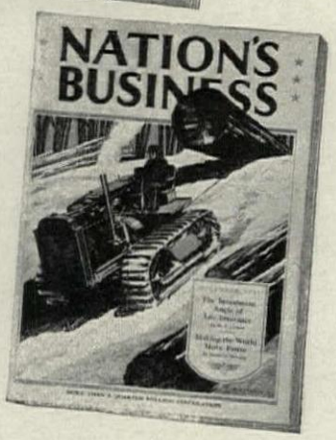
You know that small size fuels cost less than larger sizes. No. 1 Buckwheat anthracite, for instance, costs about half as much as the so-called domestic sizes. Building owners as well as superintendents know how much the Spencer saves.

Every Spencer Heater is precision built — with heat travel, combustion chamber, and water-ways scientifically designed to get as much heating efficiency from any fuel as any other heaters. In addition to this is the saving they make by burning small size, low cost fuels. They are made in cast iron sectional and steel tubular types, in sizes for every kind of building, from bungalow to sky-scraper. Write for illustrations, descriptions and capacities that are guaranteed in actual square feet of cast iron column radiation. Spencer Heater Company, Williamsport, Pa.

SPENCER SAVES

SPENCER
steam, vapor or hot water
HEATERS

Some of the national magazines in which advertising of Johnson Oil Burners is regularly appearing.



Your clients know about Johnson Oil Burners

. . that's why they voice approval when you specify a "Johnson".

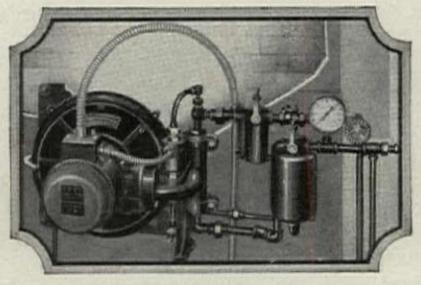
Through the leading magazines of the nation, home owners are being told the story of the efficiency and dependability of Johnson Oil Burners. They are becoming more and more familiar with the reasons why Johnson Oil Burners have been chosen by tens of thousands from Maine to California.

You can recommend and use Johnson Oil Burners for every heating and power purpose with the assurance that they will give enduring satisfaction day in and day out, year after year.

There is a size and type for every requirement. And each product, fully guaranteed, is the result of more than 23 years experience in the exclusive manufacture of oil burning equipment.

The accumulated data of our engineering department is available to you. We will be glad to help you in the solution of any of your heating or power problems.

Separately bound copies of our catalogue in Sweet's for drafting room use will be mailed free on request.



JOHNSON OIL BURNERS

LISTED AS STANDARD BY THE UNDERWRITERS' LABORATORIES

Oil Burning Equipment for Every Heating and Power Purpose

Johnson Rotary Burners, with either manual, semi-automatic or full automatic control, are made in three styles and six sizes—giving a range of from 250 to 27,800 square feet of steam radiation or the equivalent. We also manufacture natural draft, whirlwind, low pressure air and steam atomizing oil burners; also electric and steam driven oil pumping and preheating equipment.

S. T. JOHNSON CO.

Main Office and Factory:
940-50 Arlington St., Oakland. Calif.

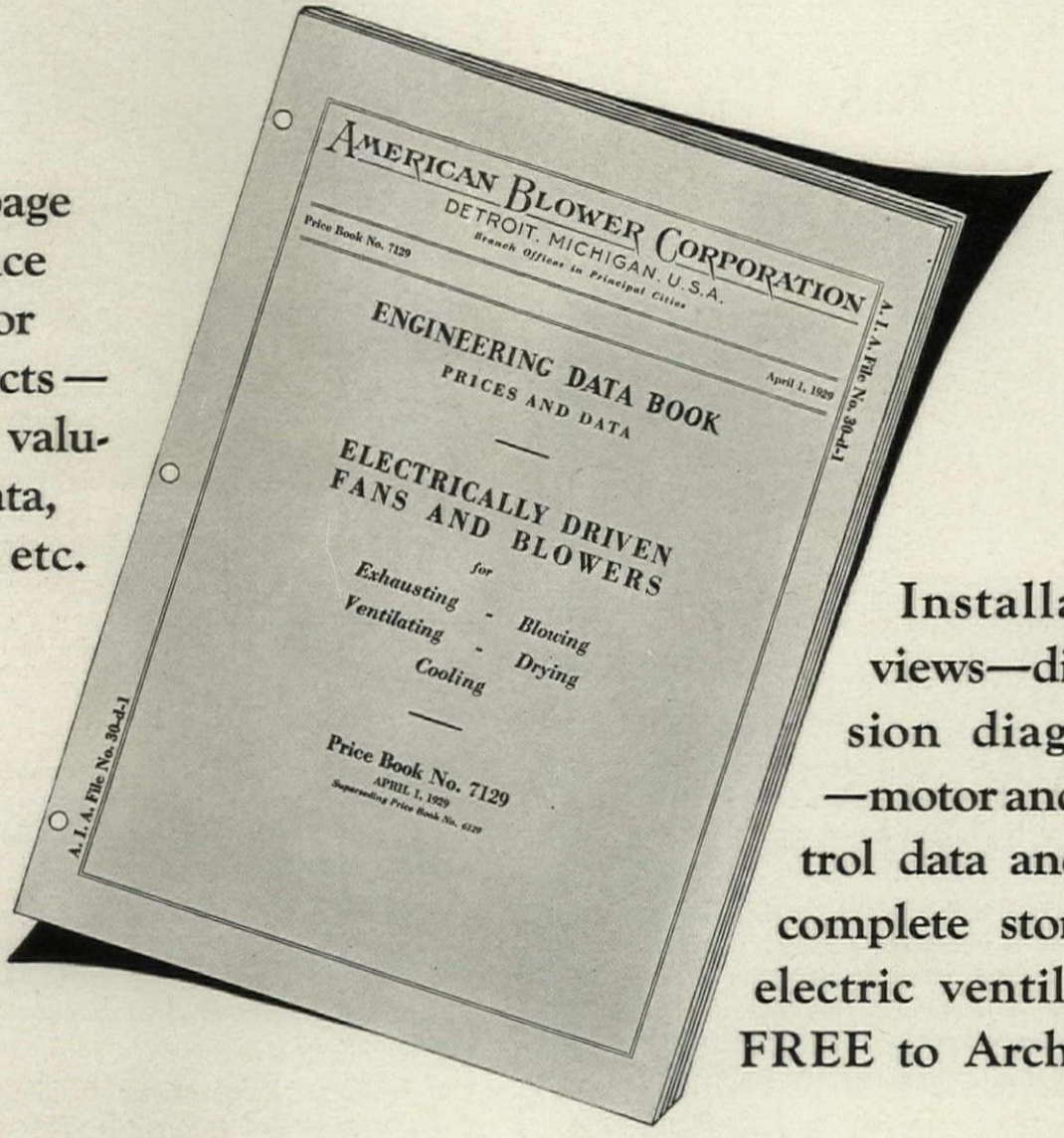
MEMBER OIL HEAT INSTITUTE

Factory Branches:
SAN FRANCISCO, SACRAMENTO
STOCKTON, PHILADELPHIA

YOU WILL FIND OUR LOCAL REPRESENTATIVE'S ADDRESS IN YOUR TELEPHONE DIRECTORY

New ventilating data for your reference files

A 40-page reference book for architects—full of valuable data, prices, etc.



Installation views—dimension diagrams—motor and control data and the complete story of electric ventilation FREE to Architects

AMERICAN BLOWER CORPORATION, DETROIT, MICHIGAN
CANADIAN SIROCCO COMPANY, LIMITED, WINDSOR, ONT.
BRANCH OFFICES IN ALL PRINCIPAL CITIES

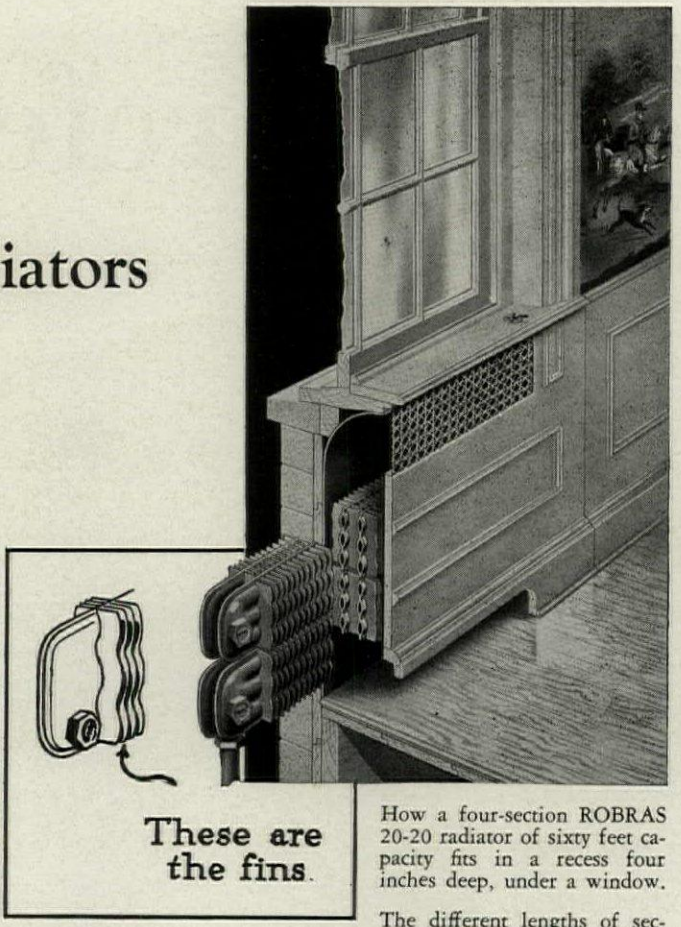
(874)

American Blower

"Sirocco" VENTILATING, HEATING, AIR CONDITIONING, DRYING, MECHANICAL DRAFT

MANUFACTURERS OF ALL TYPES OF AIR HANDLING EQUIPMENT SINCE 1881

Why ROBRAS 20-20 Radiators Take Up So Little Space



How a four-section ROBRAS 20-20 radiator of sixty feet capacity fits in a recess four inches deep, under a window.

The different lengths of sections determine the ratings of these radiators.

WHEN interested clients ask you, "How can such a little radiator give out as much heat as the large one?" you can say:

"Because both sides of the thin fins, at right angles to the prime surface of the radiator, are heating surfaces, throwing off heat at higher temperatures than could the old-fashioned radiators.

"Then, because the fins of each section form flues when enclosed singly, or in multiple sections, which accelerate the flow of air. Thus the air in the room is brought more frequently through the radiator.

"These radiators go in-the-wall, out-of-sight and out-of-the-way. They heat up more quickly. None of the heat is wasted through radiation through the outside walls."

Due to the ease of installation these radiators are no more expensive than enclosing old-fashioned radiators, yet the satisfaction of the owner of having the radiators out-of-sight is enormous.

Our booklet, "Proof of the Pudding," is ready to be mailed to you. It shows many interesting ways of installing these radiators out-of-sight and out-of-the-way. Please send us your name so that we may send it to you.

ROME BRASS RADIATOR
CORPORATION

ONE EAST FORTY-SECOND STREET , , , NEW YORK CITY

KNOW ELECTROL BY THE HOMES IT HEATS
Residence of D. R. Calhoun, St. Louis County, Missouri

Electrol service gives you a slide rule on heating specifications

Electrol, accepted when oil heating was still a problem, has made automatic oil heat applicable to every heating job . . . adaptable to every type of heating plant.

You can specify Electrol secure in the knowledge that it will adequately meet the heating requirements of any home, large or small. You can work with confidence with the local sales organizations which distribute and service the Electrol Automatic Oil Burner. They know oil burners—Electrol in particular—and their specialized knowledge and ability are always exercised under your direction . . . Draw freely upon Electrol service.

Electrol is electrically operated, electrically controlled, electrically ignited. Quiet . . . Economical . . . Entirely Automatic. Wherever it is sold you will find a complete oil heating service, backed by a sound, large and growing manufacturing organization.

Electrol models range from 200 to 5,000 square feet of steam radiation, exclusive of piping and risers or equivalent. Purchase can be financed along with the financing of the new building. Write for the Electrol regulation A. I. A. Folder, or consult the Electrol Sales and Service Representative in your city.

ELECTROL INCORPORATED
179 Dorcas St. St. Louis, U. S. A.

ELECTROL

The OIL BURNER with *The Master Control*

LISTED AS STANDARD BY THE UNDERWRITERS' LABORATORIES

MEMBER
OIL HEATING
INSTITUTE

Heat—*down* in the "Working Areas" —Instantaneously [Proved by the Smoke Test at Minneapolis Thresher Co.]

Turn on the heat, and the fan, and instantly a flood of warmed air starts to circulate—**down in the working areas where it is needed.** These photographs taken in one of the buildings of the Minneapolis Thresher Co., tell the story of McQuay efficiency better than words.

One McQuay Heater (Number 660), weighing less than 150 pounds will heat as much floor space as 4000 pounds of cast iron radiation, comfortably warming 2500 sq. ft. of area, and driving the heat as far as 75 feet.

Taken immediately after turning on the heat and fan this photo shows the flow of heated air starting down.

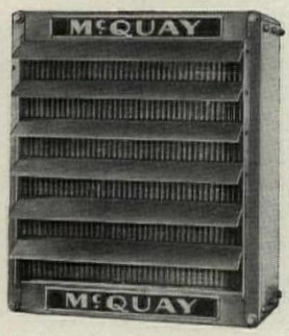
McQUAY UNIT HEATERS

Cut your heating costs in two ways. They get the heat down where it is needed, so they don't use a big share of the heat to warm the unused parts of your factory—up near the roof—as with old-time heating methods.

And they *cost less to install.* Another saving.

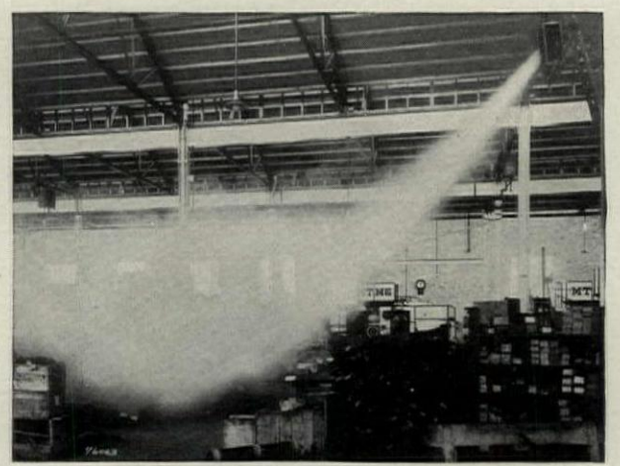
5 Seconds Afterward the heat is down to the floor and starting to spread.

Heating Element — All Copper — Braised Eliminating Leaks



Before a Heater leaves our factory it is *triply tested. First* with a steam pressure far greater than will ever be put into it. *Second* to be sure it gives all the heat guaranteed by its rated capacity. *Third* to be sure the fan is noiseless. So you can bank on a McQuay to be *right,* work right, and stay right.

Any Heating Contractor will quote Prices and Specifications.



Another 5 Seconds and the heat has spread—along near the floor as far as 75 feet from the heater. Note that all the heated air is forced down into the working area.

McQUAY RADIATOR CORPORATION

General Sales Office: 35 East Wacker Drive Chicago
Boston: 10 High Street Cleveland: 291 E. 149th Street
New York: 2148 Graybar Building
Newark, N. J.: J. F. McLaughlin Co., 738 Broad Street
Pittsburgh: Bushnell Machinery Co., Century Building

Forty-four Years of Proof Positive

The Johnson Service Company originated automatic temperature regulation 44 years ago.

Up through all these great many years automatic temperature regulation has grown in use, and has constantly improved under the scrutiny, field and laboratory engineering of The Johnson Service Company.

Imitating equipment, substitute devices have come and gone in this long Johnson time: inadequate, mediocre, failing attempts at temperature regulation have been not uncommon.

While The Johnson System continued, survived, and today remains as the recognized complete and thorough method of control, in principle, design and construction; apparatus, equipment and service efficiency; reliable, responsible, tried and found faithful.

The scope of The Johnson System Of Heat And Humidity Control evidences the thoroughness with which The Johnson Service Company occupies the field.

Briefly, Johnson Service pertains to the automatic regulation of temperature and humidity in homes, school, business and industrial buildings, private and public institutions of every kind.

It applies to every form and method of heating and ventilating: and the thermostatic control of refrigeration and for products requiring varying degrees of temperature in their processes of manufacture.

". . . . the system in our building became very unsatisfactory, and after considerable worry and expense at attempts to have it repaired we had the system removed and The Johnson System installed . . and we find Johnson equipment and service satisfactory and complete in every way."

Name Of Writer On Request.

And it is not a device, simply an attachment or installation alone that is offered. Johnson *Service* is the all-embodying, accomplishing factor; an essential completeness for permanency and the required results.

JOHNSON SERVICE COMPANY
MILWAUKEE, ... WISCONSIN
ESTABLISHED 1885.
BRANCHES IN ALL PRINCIPAL CITIES.

JOHNSON HEAT & HUMIDITY CONTROL

The All Metal System . . .
The All Perfect Graduated
Control of Valves & Dampers

The Dual Thermostat (Night and Day)
System Of Control. . . . . .
Fuel Saving: 25 to 40 Per Cent Per Year.

REVIEWS OF MANUFACTURERS' PUBLICATIONS

MILWAUKEE CORRUGATING COMPANY, Milwaukee. "Metallic Construction for the Modern Home." Its use.

Every year sees the wider and more varied use of metal in building construction, and particularly in structures of a residential character. The advantages of using metal are obvious, one being its being fireproof or at least fire-resisting, while another lies in its not being subject to expansion or contraction with constant changes in atmospheric temperatures. Another advantage is found in the great durability of metal, and still another in the ease with which it is kept clean. This booklet presents in most attractive form the materials made and sold by the Milwaukee Corrugating Company for use in residential buildings,—metal lath, corner beads, door and window casings, base screeds, and picture mouldings. All these materials are described, their advantages explained, and illustrations as well as diagrams and other detailed drawings make the methods of their use easily understood. The company is to be congratulated on the excellent taste shown in designing those of its materials in which good taste counts as a factor,—particularly its casings.

HOLOPHANE COMPANY, INC, New York. "The Lighting of Modern Office Buildings. A brochure on the subject.

One cannot work unless one can see. One cannot see unless one has two things,—eyesight and light. If light is cut down, vision is decreased, just as though one had cut down on eyesight. Office lighting deserves the attention of every executive, and fortunately it is securing that attention in more offices. Business men are realizing daily that the amount of work their employes accomplish, the number of mistakes made, the health and general efficiency of employes' pocketbooks are directly affected by office lighting. Artificial lighting in offices is as important as daylight. In the latitude of New York there are only 110 days in the normal year when for six hours a day the daylight can be described as really bright. On other days, artificial light is necessary in most offices during the greater part of the day. A careful analysis of the lighting requirements of an office building of the most modern type, bearing in mind the necessity for both economy of operation and efficiency of the workers, leads to a separation of the spaces into certain groups, such as, general office space, private rooms, and executive offices. Entrance halls should not be overlooked, as their appearance is of the utmost importance. This catalog offers valuable information regarding modern office lighting and equipment.

WOLFF CO., 2057 W. Fulton St., Chicago. "Wolff Superior Plumbing Fixtures." A work on bathroom equipment.

The modern bathroom reflects the character of the home, and the increasing preference for the beautifully colored rainbow enameled iron bath tubs and lavatories has brought forth a demand for vitreous chinaware in color to match. Wolff "Duroware" is a high grade product made in all the staple designs in the regular white finish or in the new colors, including old ivory, turquoise, dove gray, sea foam green, shell pink, dark sea green, and many other excellent colors. In the preparation of the Wolff "G" Earthenware Catalog the organization has endeavored to present a complete line of fixtures such as are preferred by the modern architect and plumber. The selection made will be found to be adequate to meet the requirements of all. The catalog illustrates and describes these fixtures in logical sequence, enabling the architect, plumber, general contractor, builder or owner to make a selection of such material as may be needed to completely fill any specification. Vitreous china ware and solid porcelain ware are carefully graded in accordance with the uniform grading rules adopted by the Sanitary Potteries in conjunction with the U. S. Bureau of Standards of the Department of Commerce. Absolute perfection is commercially impossible in the production of this ware, and when inspected and passed as "regular," selection must be accepted as representing the standard under which Sanitary earthenware is sold. Wolff Superior Plumbing has always represented the highest quality, and the specification of this product gives assurance of satisfaction. Wolff "Duroware" vitreous china fixtures can be supplied in colors to match Wolff "Rainbow Enamel," and in many styles.

KOHLER COMPANY, Kohler, Wis. "Kohler of Kohler News." A monthly publication issued by the company.

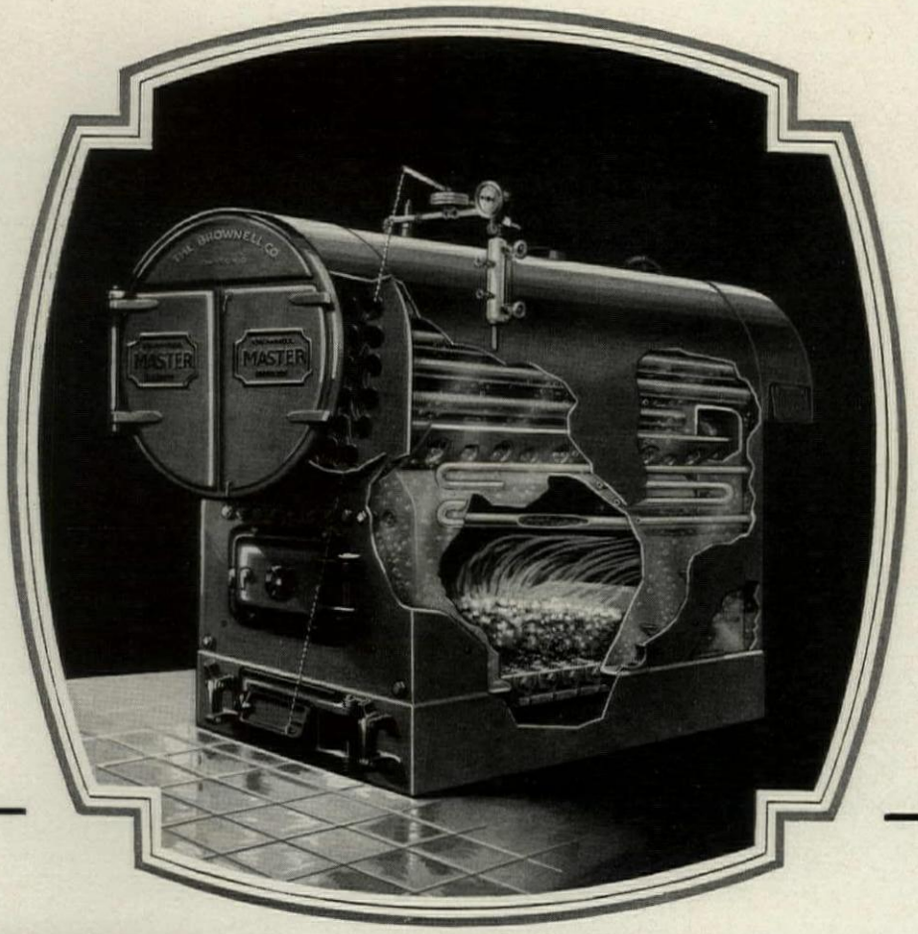
Slow bath tub draining has always been a source of trouble in residences, hotels, apartments, or individual homes. In a home where bathing equipment is limited or the family is large, the bathroom is constantly in demand. The same is true when more than one guest occupies a hotel room. And often the time lost by a slow-acting bath drain causes inconvenience and embarrassment. The "Rapidrain" described in a recent issue of the *Kohler News* is all that the name implies. Because of remarkable construction of the removable strainer plate, the large sized holes and increased draining area, a tub is drained with the utmost rapidity,—in fact, the work is done twice as quickly as an ordinary drain does it. The rapid action of the draining water causes friction with the fitting, helping to keep it clean and sanitary. Because of the "Rapidrain's" simple means of access, installation and construction, costs are likely to be considerably reduced. This little publication is issued monthly at Kohler, Wis., by and for the Kohler organization.

DETROIT STEEL PRODUCTS COMPANY, Detroit. "Fenestra Screen Casements." An important detail of equipment.

The screen casement has only recently been announced, but it has already been hailed by the architects who have seen it as the solution of the problem of screening open-out steel casements. Casements in which non-warping, metal-to-metal contact is permanently assured between flat screen frame and flat window frame, will greatly interest the architect. By screening the house or office with screen casements, one will have extra light; better ventilation; a 100 per cent opening if desired; finger touch operation without swelling, shrinking, warping or sticking; strong, fire-resisting solid steel members; extension hinges that make outside washing easy from within the room. "Fenestra Screen Casements" is a folder published by the Detroit Steel Products Company describing the advantages of the new Fenestra Casement that comes equipped with a screen. For the first time it is possible to use a flat all-metal screen fastened directly to the inside of the casement, entirely independent of the window trim. The folder describes how this is accomplished, the types and sizes of screens, and the changes that have been made in the hardware. Write the Detroit Steel Products Company, 2250 E. Grand Boulevard, Detroit, for this folder. It is worth the attention of architects and engineers.

JANETTE MFG. CO., 556 West Monroe Street, Chicago. "More Heat from Any Hot Water System on Less Fuel."

Progress in the development of heating has been largely a matter of development of details for use with heating systems. The booklet noted here deals with the "Hydrolator," described as "a motor-driven centrifugal pump designed to operate on balanced hot water systems, open or closed type. It consists of a sturdy Janette Repulsion-Induction motor mounted on a 12-inch pipe section with the pump and valve assembly located in the pipe section. Pump rotor is located off the line of natural water flow. Rotor and valve are rust-proof and trouble-proof." The brochure says that the "Hydrolator" solves many problems of hot water circulation: "(1) *Sluggish Circulation:* The Hydrolator provides positive, rapid circulation; overcomes sluggishness. (2) *Poor Circulation Where Radiators Are on a Level With or Below the Boiler:* The Hydrolator will force circulation to every radiator, no matter where located. (3) *Heating One Building from Another:* A problem encountered where a garage is to be heated from a boiler in the basement of a house. With the introduction of the Hydrolator this is no longer a problem. (4) *Long, Horizontal Pipe Runs,* as in greenhouses; The Hydrolator provides a rapid circulation heretofore impossible on such system. (5) *'Traps' and 'Short Circuits':* The Hydrolator easily overcomes both of these evils. (6) *Heating Additional Rooms Built Onto a House,* or providing proper heat on systems with insufficient radiation. (7) *Poor Circulation in One Section of a Building:* The Hydrolator in this case is usually mounted on the return from this section, with a valve placed on the boiler side of the Hydrolator to regulate the flow," all valuable qualities.



SUPERIOR FEATURES YOU WILL APPRECIATE

"A step forward" sums up the comments of architects and engineers familiar with the various special features embodied in the BROWNELL welded steel boiler.

One of these is the tapered water legs, which are larger at the top than at the bottom This construction allows for the natural expansion of the water as it takes up heat in its travel upward thru the "legs." In this way the usual resistance to expansion is lessened with consequent improvement in the entire circulation system.

Another is the provision of considerably more radiant heating surface than usual. Still others are the double section economy grates, and the installation of the service coils in the upper part of the tapered water legs. This last feature makes it possible to have hot water in mild weather without keeping up a full head of steam (low fire sufficient). It also eliminates installation of an auxiliary hot water heater.

This equipment is built for either coal or oil firing, or both at the same time, and is fully illustrated and discussed in special Bulletins ready to mail.

THE BROWNELL COMPANY *Founded 74 Years Ago* **Dayton, Ohio**

REPRESENTATIVES IN PRINCIPAL CITIES

Brownell

Electric Welded Steel

Boilers

REVIEWS AND ANNOUNCEMENTS

THE COLUMBIA MILLS, NEW YORK. "Columbia Venetian Blinds." A valuable booklet on the subject.

Nearly as important as the provision of daylight is the matter of its proper use, which in turn is dependent upon its correct distribution. A large, open office area, for example, may have windows only at one end, which means that unless those whose desks are placed near the windows are willing to work in the blinding glare of brilliant light, it is necessary to draw down window shades which of course darkens the entire area excepting the end near the windows and which often renders the opposite end of the room almost useless. This could easily be prevented by using at the windows Venetian blinds, which, being lowered, render it possible to so regulate the light that its total exclusion may be had, or else it may be filtered, reflected, amplified, or brought in uninterruptedly as desired. "Recently, in the research laboratory of a leading university, it was established that with Venetian blinds it is possible to increase the natural daylight in the darker portions of a room from 100 per cent to 130 per cent, according to the color, finish and angle of the slats. This conclusively demonstrates the possibilities and practical value of Venetian blinds as a means for increasing as well as controlling the natural light in a room. The findings further reveal that the most scientific and valuable effect of a properly made Venetian blind is, perhaps, a very noticeable and agreeable alteration in the quality of the natural lighting in a room. While shutting out excessive sunshine or large expanses of bright sky, it is possible to throw a larger part of the intercepted light upon the ceiling or side walls so that it may become effective as an indirect component in the illumination of the room." This useful brochure presents a study into the use of Venetian blinds in making more comfortable and convenient large working areas in banks, stores, lodges, schools and offices, or else such areas as solariums and verandas.

DETROIT STEEL PRODUCTS COMPANY, Detroit. "Suggestions for Use of Steel Sash for Ornamental Buildings."

Few people other than architects realize how great may be the effect upon a building's appearance of the sash which are used at its openings. Even an intelligent layman might examine a structure, note any excellence possessed by its proportions, and even appraise any possible merit attaching to the spacing of its windows and any good qualities belonging to it because of care taken in other ways, and yet quite fail to realize that much of a possibly happy result is due to the character of its window sash. It was indeed a fortunate day for architecture when use of steel for making sash was begun, for the extreme slenderness which use of steel makes possible for muntins and other members brought about refinement which sash of wood might never have attained, since witb wood the requisite strength could be had only by using sheer bulk of material. This excellent brochure was prepared by Preston J. Bradshaw of St. Louis, and presumably in view and in light of his experience. He says: "My idea in presenting this little booklet suggesting the use of standard units of steel sash in ornamental buildings was prompted by the thought that possibly the widespread use of steel sash in industrial buildings may have dulled the thought of the adaptability of this material to structures other than of factory and warehouse construction. The possibilities of this comparatively recent product in the building world are so many, that it is hard to give a clear, concise idea of upon just how many and what kinds of buildings it can be used in to advantage. I have found in my own personal experience many smaller types of buildings where standard steel sash, properly ornamented with different colorings, have brought about a remarkable improvement in the architectural appearance of the structure. The low cost and the adaptability of standard steel sash, its provision for providing proper ventilation, its indestructibility and the delicate lines it enables the architect to employ, should clearly demonstrate the folly of using wood sash in buildings when it is possible to obtain this steel product. If these few ideas will help my colleagues in their work, the pleasure I have had in making the sketches will be increased."

Kermit H. Smith, 1602 Avenue C, East, Cedar Rapids, Ia., desires the publications issued by manufacturers.

Edward Birmingham announces his removal from 45 Warburton Avenue to 11 Manor House Square, Yonkers, N. Y.

Herbert A. Brand announces his removal from 510 North Dearborn Street to 1941 Daily News Building, 400 West Madison Street, Chicago.

Albert E. Taylor, formerly of Vernon Road, Drexel Hill, Pa., desires that his name be removed from manufacturers' mailing lists until further notice.

Owing to the retirement of Frank J. Helmle, the firm of Helmle, Corbett & Harrison will after this be known as Corbett, Harrison & MacMurray.

S. T. Crowere & Associates announce their recent removal from 22 West Monroe Street to the Willoughby Tower, Madison Street and Michigan Avenue, Chicago.

The Colorado Chapter of the American Institute of Architects announces the election at their recent annual meeting of George P. Heinz, founder of the Heinz Roofing Tile Company, as an honorary member.

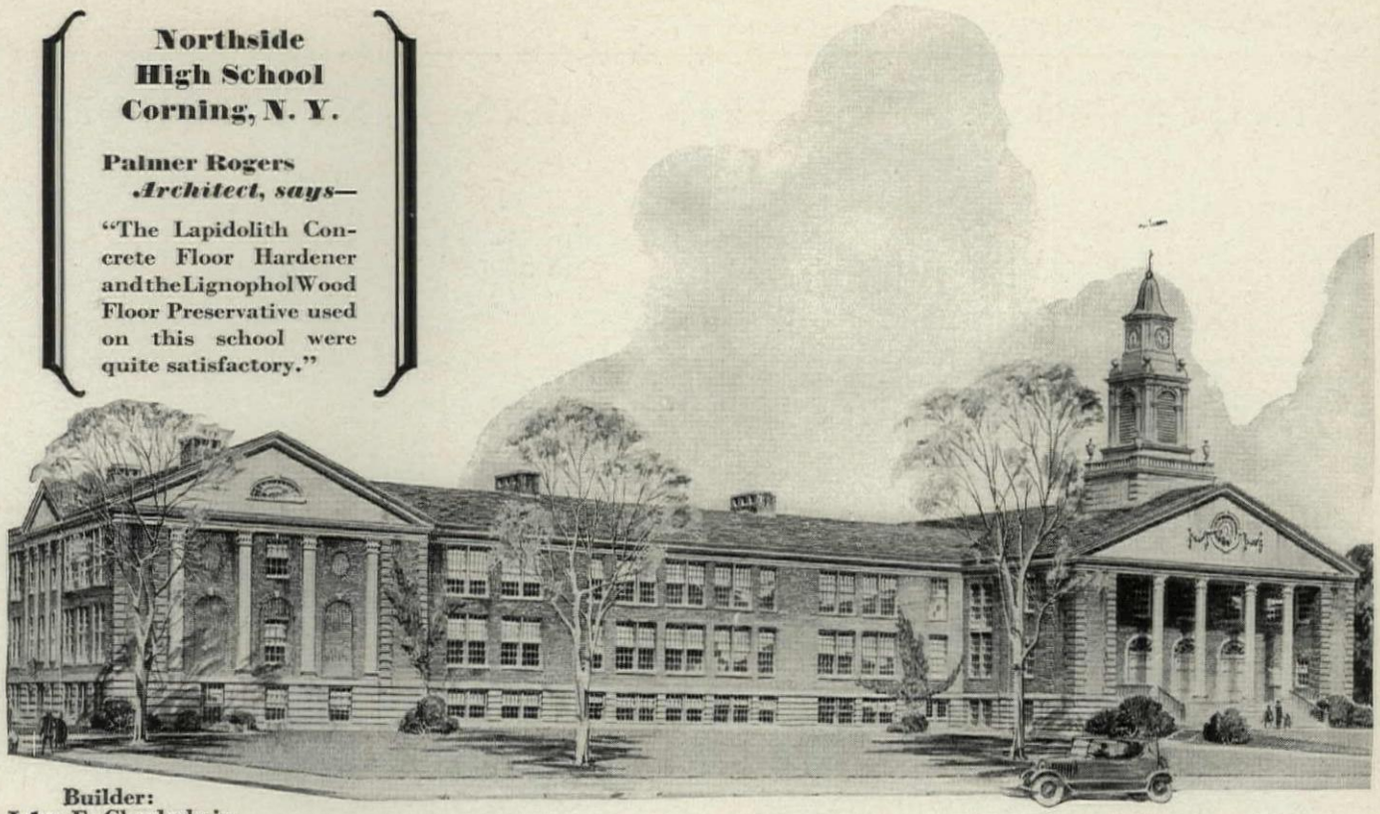
BRYANT ELECTRIC CO., Bridgeport, Conn. "Spartan Flush Receptacles and Flush Plates." Their adaptability.

The high excellence to which use of electricity has been brought,—excellence which approaches perfection,—is due largely to the ingenuity with which the makers of the countless details involved have met the demands made upon them. Even details seemingly unimportant have been made the objects of endless effort. This folder, for example, deals with a highly improved type of the receptacle or plate widely used with lighting or other forms of electrical service. "Spartan" receptacles incorporate two main features,—interchangeability and standardization. They are designed to receive plugs with prongs or blades which are either parallel or tandem. The "Spartan" design has become standard throughout the world,—is used more extensively than any other in the making of convenience outlets. All Bryant "Spartan" receptacles are made with heavy, high quality composition or porcelain bodies, heavy bronze contact arms and brass contacts, and with large size and full length binding screws. A distinctive Bryant feature is the cupping of the receptacle boss and the forming of a raised rib of composition across the cup between the slots, making easy and convenient the insertion of either type of the prongs of the cap.

Northside High School Corning, N. Y.

Palmer Rogers *Architect, says—*

"The Lapidolith Concrete Floor Hardener and the Lignophol Wood Floor Preservative used on this school were quite satisfactory."



Builder:
John F. Charlesbois

To withstand the ceaseless traffic of scuffling, hurrying feet . . .

This School used LAPIDOLITH TRADE MARK on its concrete floors

This liquid chemical hardens, dust-proofs, and wear-proofs by penetrating deep into the porous concrete and binding the loose particles into a homogeneous mass that withstands years of service. If you want granite-hard, smooth concrete floors, be certain they are treated with Lapidolith—the original concrete floor hardener.

LIGNOPHOL on its wood floors

This penetrating preservative for wood floors must not be confused with mere surface treatments that soon wear off or evaporate. Lignophol penetrates and carries to the wood cells life-giving gums and oils that keep the floor from cracking, checking, warping or splintering and protect it from dry or wet rot.

Some other Sonneborn Products

Hydrocide Colorless—the invisible waterproofing for exposed exterior walls. Penetrates brick, stone or cement, caulking the pores against the weather.

Cemcoat—Exterior or interior wall coating. Stays white after others turn yellow. Can be washed over endlessly.

L. SONNEBORN SONS, Inc.
114 Fifth Avenue
New York

COUPON

L. Sonneborn Sons, Inc., 114 Fifth Ave., New York. A.F. 6

Please send me, without obligation, demonstration samples and literature on:—Lapidolith....; Lignophol....; Cemcoat....; Hydrocide Colorless....; (Check products that interest you.)

Name.....

Address.....

Company.....

Position.....

INDEX TO ADVERTISING ANNOUNCEMENTS

PART 1—ARCHITECTURAL DESIGN

PART 2—ARCHITECTURAL ENGINEERING AND BUSINESS

An Oil Burner For Every Purse and Purpose

Flamingo Hotel—Chicago, Hardinge Installation

Another one of America's Finest Hotels Equipped with Hardinge

Thirty-eight years of painstaking research and experience in the manufacture of precision-built instruments has brought a nation-wide recognition to the Hardinge line of oil burners. Architects and engineers are invited to look over the long list of prominent hotels and big buildings everywhere which are being efficiently and economically heated with the Hardinge fuel oil burner. Our two models, Domestic and Industrial, in 9 different sizes and combinations, enable specific treatment for every heating problem from bungalow to skyscraper. When you specify Hardinge you are specifying ten years of *absolutely guaranteed* oil heating efficiency.

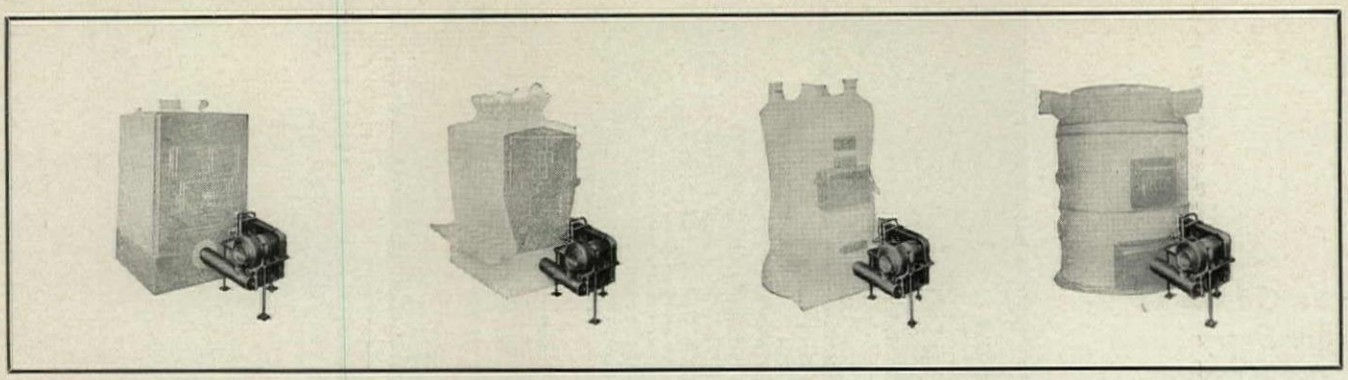
HARDINGE FUEL OIL HEAT

Hardinge Brothers, Inc.

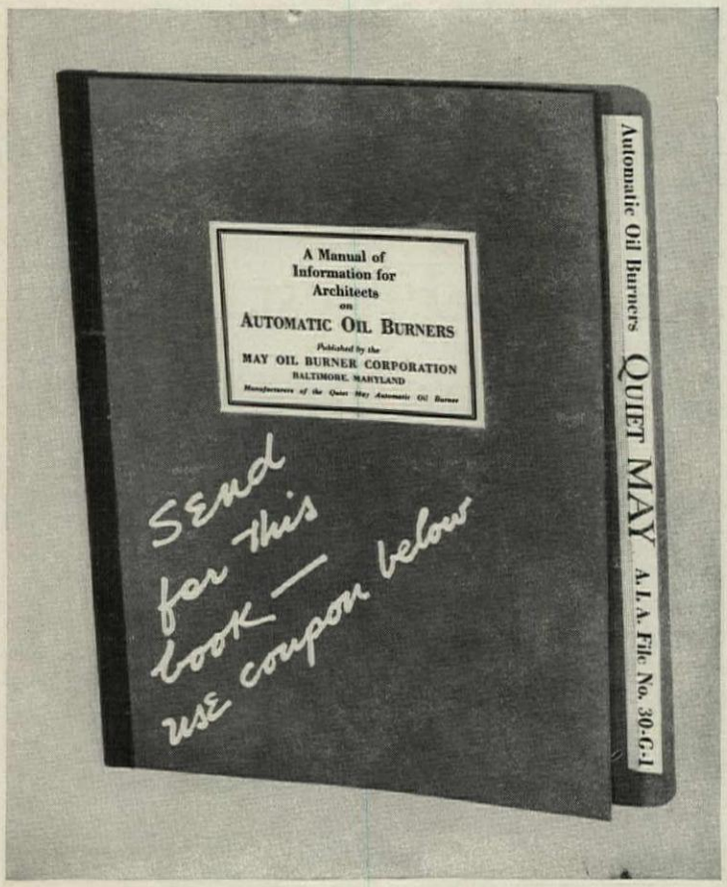
Factory and General Offices

4149 Ravenswood Avenue, Chicago, Ill.

Factory Branches: Chicago—Michigan Avenue at Ohio Street. Boston—843 Beacon Street.



WHEN OIL is chosen as the fuel for any standard heating unit, The May Automatic Oil Burner offers the mechanical means of producing a flame inside the boiler or furnace.



ARCHITECT'S MANUAL

Our Manual of Information for Architects on Automatic Oil Burners is a useful book in connection with the installation of any standard make of oil burner. We have also included in the Manual the latest *Regulations of the National Board of Fire Underwriters* covering oil burners. (Note: Many architects' offices have not as yet secured these regulations covering oil burners. For this reason we included them in our Manual on automatic oil burners.)

A PICTURE BOOK FOR THE HOME OWNER

We have prepared a picture book with illustrations in perspective, realistically rendered, with walls cut away to show the various units that make up a complete heating system which uses oil as the fuel.

Either or both of these books will be sent to you. Use coupon below.

MAY OIL BURNER CORPORATION

3500 E. Biddle St., Baltimore, Md.

F-69

MAY OIL BURNER CORPORATION
3500 E. Biddle St., BALTIMORE, MD.

Please send me items checked below:

☐ Manual for Architects
☐ Book for Home-Owner

Individual_____

c/o Firm_____

Street_____

City_____ State_____

THE ARCHITECTURAL FORUM

INDEX TO VOLUME L — JANUARY TO JUNE INCLUSIVE, 1929

*Illustrated — ex.—exterior — in.—interior — pl.—plan

D

*Illustrated ex.—exterior in.—interior pl.—plan

*Illustrated ex.—exterior in.—interior pl.—plan

*Illustrated ex.—exterior in.—interior pl.—plan

T

*Illustrated ex.—exterior in.—interior pl.—plan

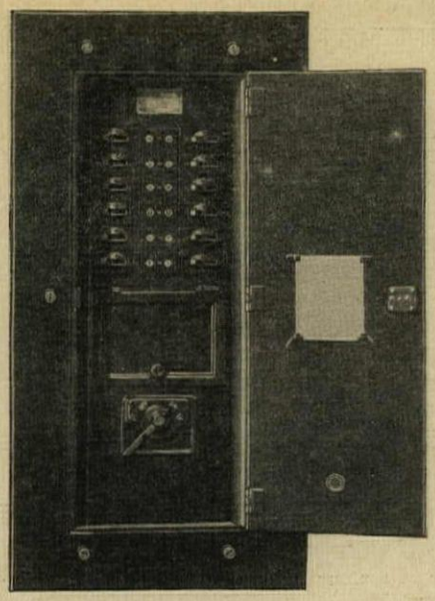
THE ARCHITECTURAL FORUM

Published Monthly by National Building Publications Division of National Trade Journals, Inc., 521 Fifth Avenue, New York, N. Y. Yearly Subscription: 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. Entered as Second Class Mail Matter at the Post Office, New York, N. Y., under the Act of March 3, 1879.

VOLUME LI
Number 1

NO FUSES

NO SWITCHES



In the branch circuits

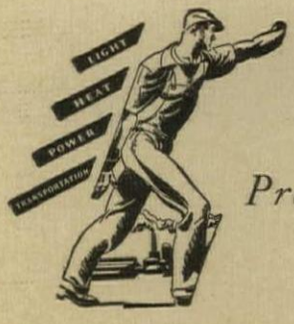
THE Westinghouse type NAB Nofuz panelboards are a radical departure from previous types of lighting control panels. Instead of the conventional toggle switch and fuse, the branch circuits are protected and controlled by automatic circuit-breakers.

These circuit-breakers, which operate on the Deion principle, have many characteristics which make them ideal for general lighting control. There are no fuses to replace when overloads occur. Unnecessary tripping is avoided because of the inverse-time-limit characteristics of the breaker. The calibration of the breaker can not be altered nor its action blocked so as to remove its protective features.

Nofuz panelboards are built with a solid neutral and are available in capacities of from 2 to 64 circuits in multiples of two circuits. Further information can be obtained from the nearest Westinghouse office.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
BROOKLYN WORKS BROOKLYN, NEW YORK
SALES OFFICES IN ALL PRINCIPAL CITIES

T 30549



Westinghouse

Products for the Building Industry include:

Circuit-Breakers	Meters	Safety Switches
Fans	Lighting Fixtures	Solar Glow Heaters
Fuses	Motors and Control	Switchboards
Insulating Materials	Panelboards	Transformers
Mazda Lamps	Ranges	Water Heaters

TRUSCON Ferrobord

TRADEMARK REG. & PAT. APPLIED FOR

Insulated *and* Waterproofed LAID LIKE BOARDS

Roofdecks of Truscon Ferrobord are as easily installed as boards. The six inch wide units interlock along their lengths forming rigid reinforcing ribs which are securely attached to the purlins without perforating the roofdeck. Butt Joint Clips securely join ends of Ferrobord insuring a continuous, smooth surface for application of insulation and waterproofing.

Truscon Ferrobord provides a strong, light-weight, fireproof roofdeck. Its initial low cost is supplemented by savings effected in structural supports. Ferrobord is furnished in 18 or 20 gage rust-resisting Armco Ingot Iron and in two depths of ribs. Write for complete information and literature.

The three types—Ferrobord, I-Plates and Ferrodeck—meet any roof condition in new buildings or replacement work.

Section Showing Ferrobord Roofdeck, Insulation and Built-Up Roofing

ARMCO INGOT IRON

TRUSCON STEEL COMPANY
Youngstown, Ohio
STEELDECK ROOF DIVISION
Trussed Concrete Steel Company of Canada, Limited, Walkerville, Ont.

Warehouses and Offices in Principal Cities of the United States and the Dominion of Canada