THE ARCHITECTURAL FORUM

ARCHITECTURAL ENGINEERING & BUSINESS

IN TWO PARTS PART TWO

APARTMENT HOUSE REFERENCE NUMBER

SEPTEMBER 1930

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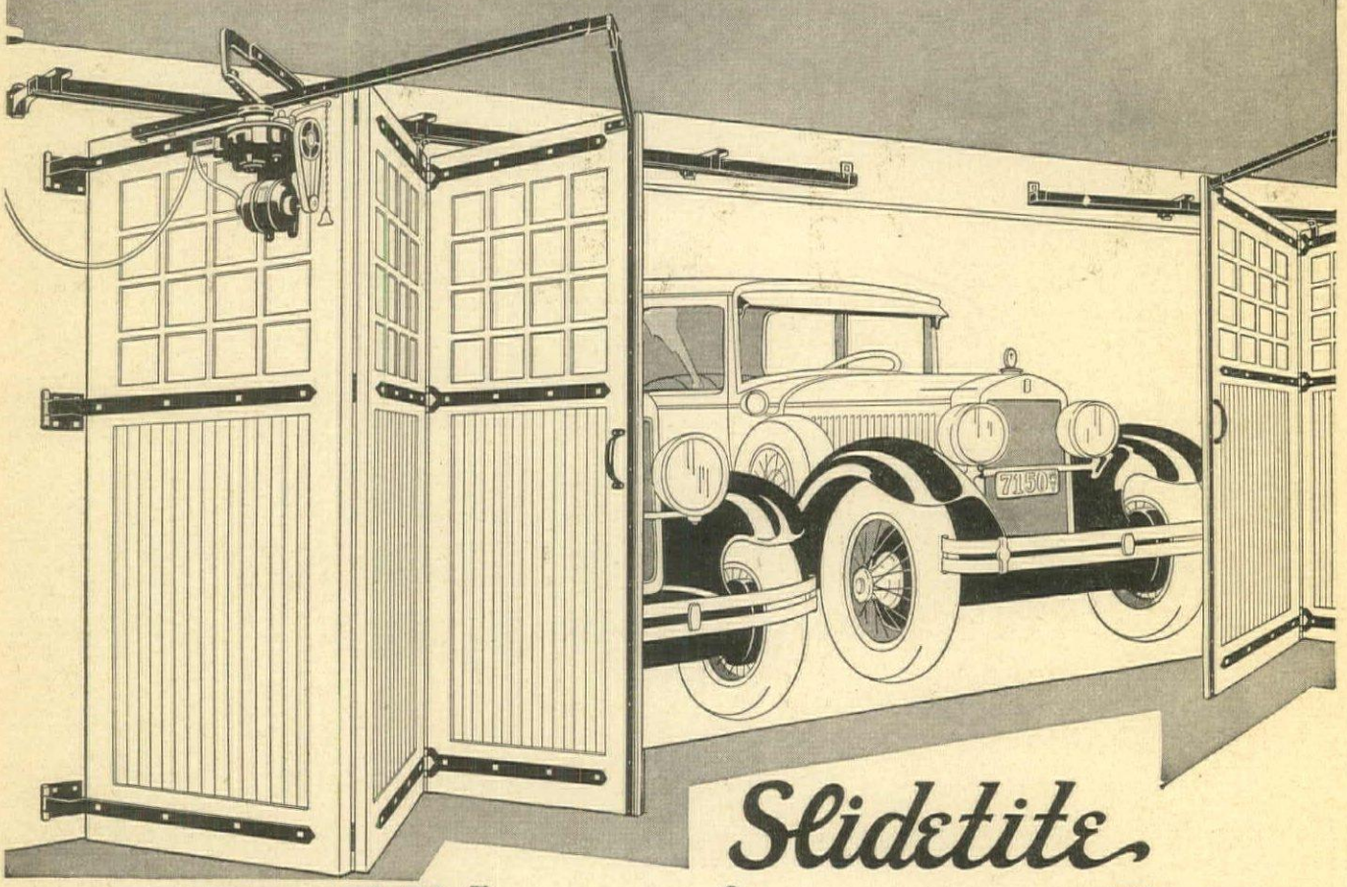

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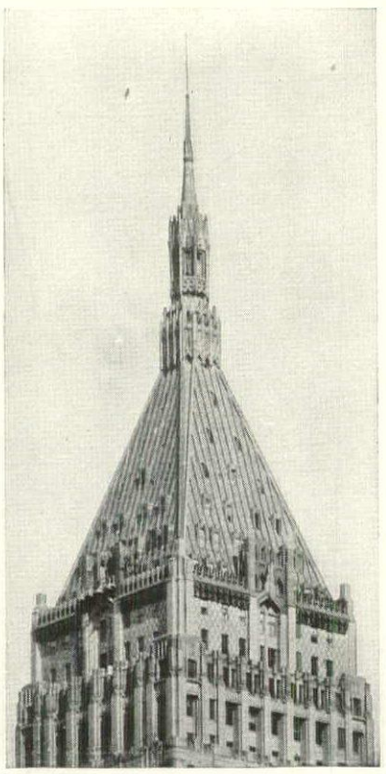
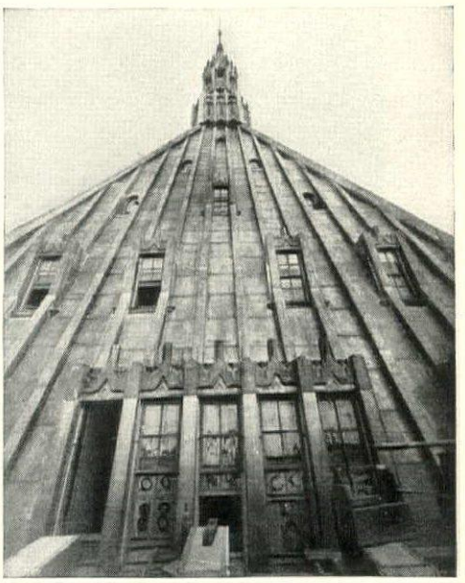
50 years 1880/1930

COPPER met the 4



The tower of the Manhattan Company Building as it actually appears. It rises 177 feet above the sixty-third floor.



An unusual perspective of the tower showing effect gained by the straight lines. The entire top is encased in Anaconda Copper.

Reproduction of the architect's original rendering of the tower.

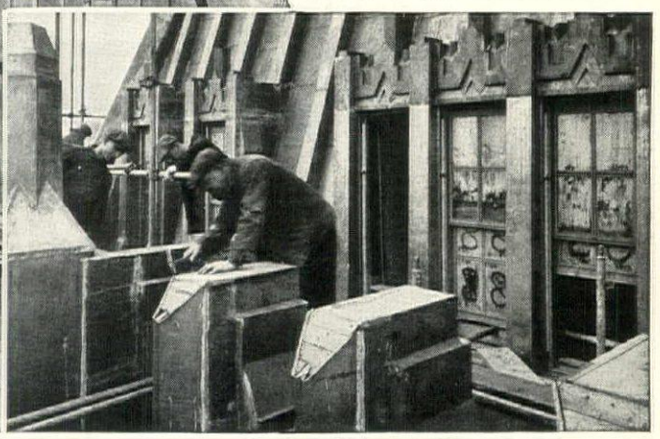
• • •

H. Craig Severance, Inc., Architects

Yasuo Matsui, Associate Architect

Starrett Bros., Builders

Jacob Ringle & Son Sheet Metal Work



Sheet metal workers applying the copper. The metal was fabricated in the shop from working drawings, making application on the job unusually fast.

ANACONDA COPPER

requirements for the roof *of the* MANHATTAN COMPANY BUILDING

The tower of the Manhattan Company Building represents the successful solution of an unusually difficult problem in architectural design. Rising to a height of nearly a thousand feet, bold handling of materials was required to endow the tower with a feeling of mass, and to accentuate light and shadow. Straight lines, alternating ribs or battens, flat surfaces and the high relief of a few decorative elements, all contributed to the final effect . . . In addition, by lead-coating the copper, the precise tonal values desired for the tower were achieved . . . But the tower did far more than demonstrate the adaptability of Anaconda Copper to the architects' decorative plans. It demonstrated the practical and economic advantages of copper as well. On this important project, the following four chief requirements in the selection of roofing material were completely met by Anaconda Copper:

COST: Standard widths of sheet copper were utilized in planning the design of the roof. This saved the expense of special cutting and forming operations. Great economies were thus effected. Furthermore, the *workability* of Anaconda Copper made it possible for the sheet metal contractor to fabricate the thousands of separate pieces and to complete the installation within the scheduled time.

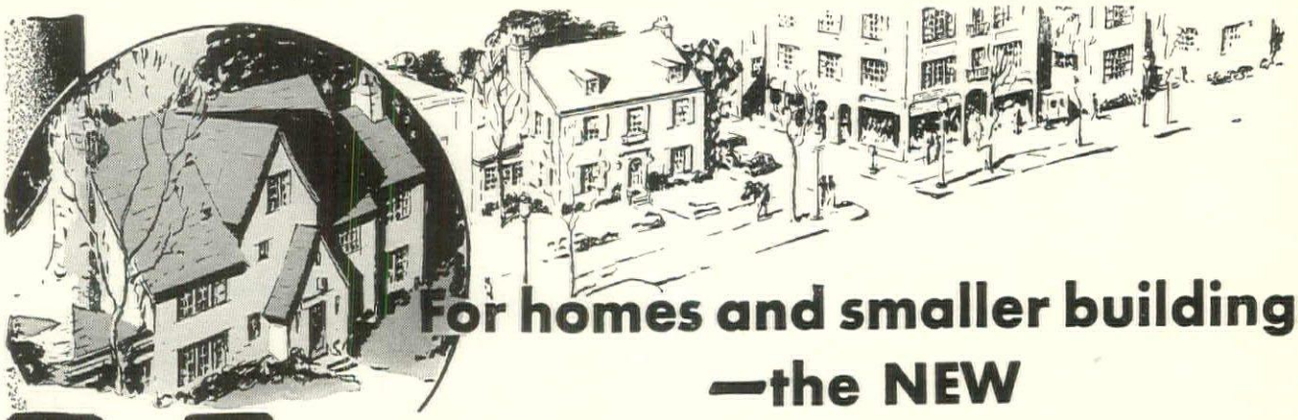
TIME: It was determined to erect this building in one year, or less. Standard materials, therefore, were essential. The architect and contractor assured themselves of prompt deliveries by taking advantage of the extensive manufacturing facilities of The American Brass Company.

DURABILITY: For hundreds of years copper has been recognized as the most durable of roofing materials. In specifying copper for the tower of the Manhattan Company Building, the architect considered the hundreds of copper roofs which are still in excellent condition after a century or more of service. The use of Anaconda Copper assures that, barring accidents, the roof will outlast the building.

UPKEEP: Because of the durability of copper, the maintenance cost of a properly laid copper roof is extremely small. During the useful life of the Manhattan Company Building, the roof of this tower will require little or no upkeep expense.

The American Brass Company is always glad to cooperate with architects in solving problems involving the use of Copper, Brass and Bronze. A representative of the Company will call at your request. The American Brass Company, General Offices: Waterbury, Connecticut.

BRASS ANACONDA from mine to consumer BRONZE



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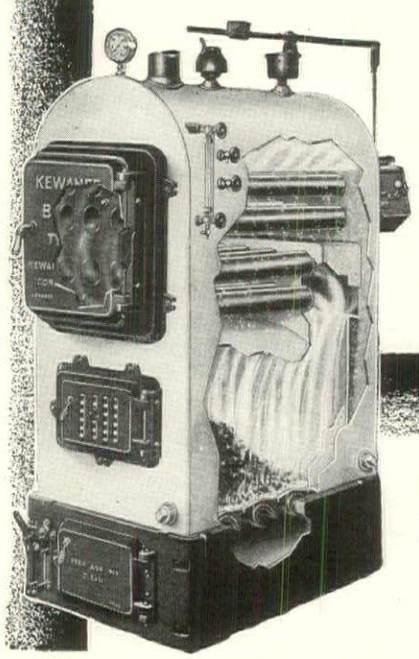

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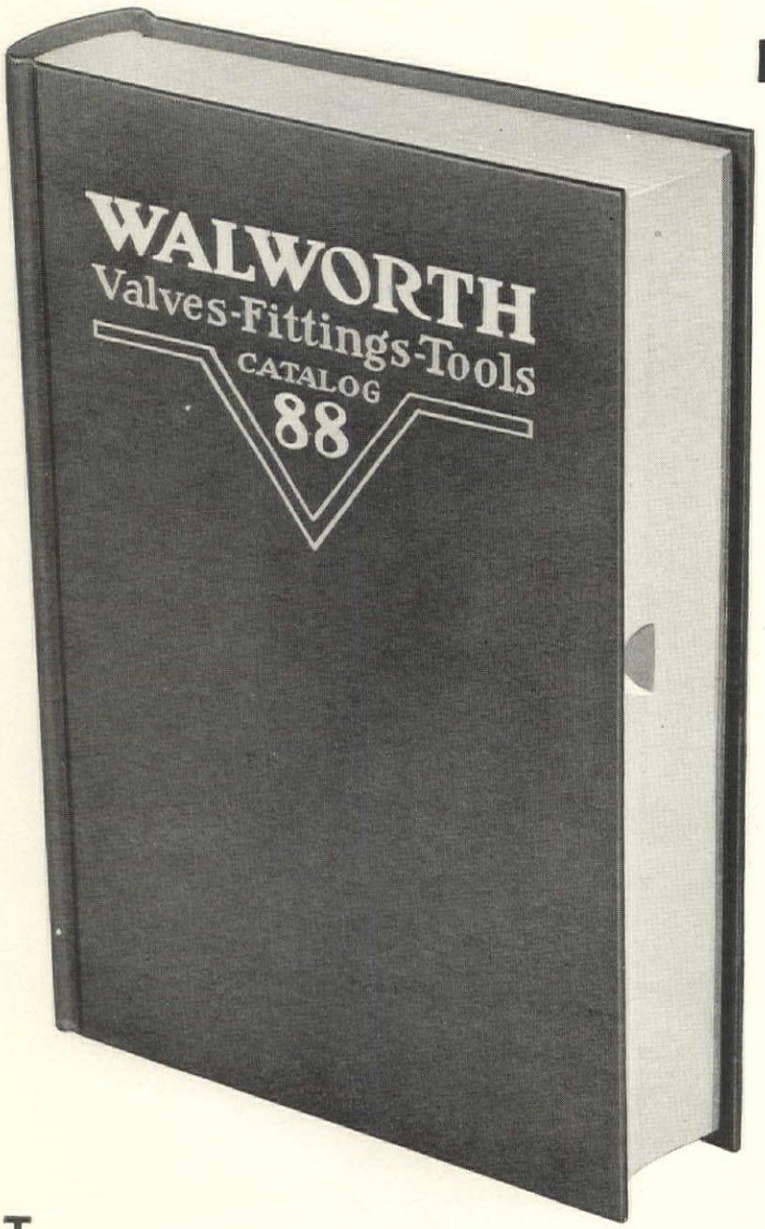

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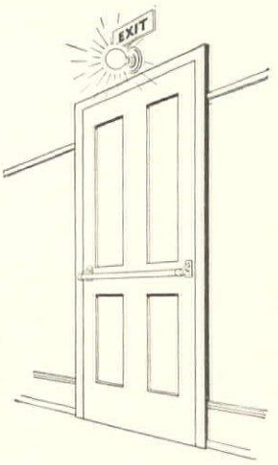

HERE IS AUTOMATIC PROTECTION FOR LIGHTS, POWER. *Picture shows a typical Exide Emergency Lighting Battery in glass jars, which make inspection easy. The cells are arranged in neat, compact racks and are placed in the basement of buildings near the engine room. They take up little space and can readily be kept spotless and clean.*

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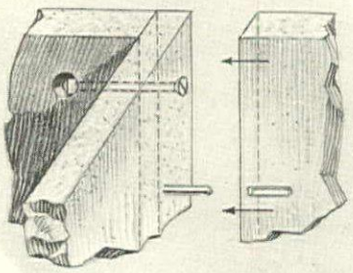
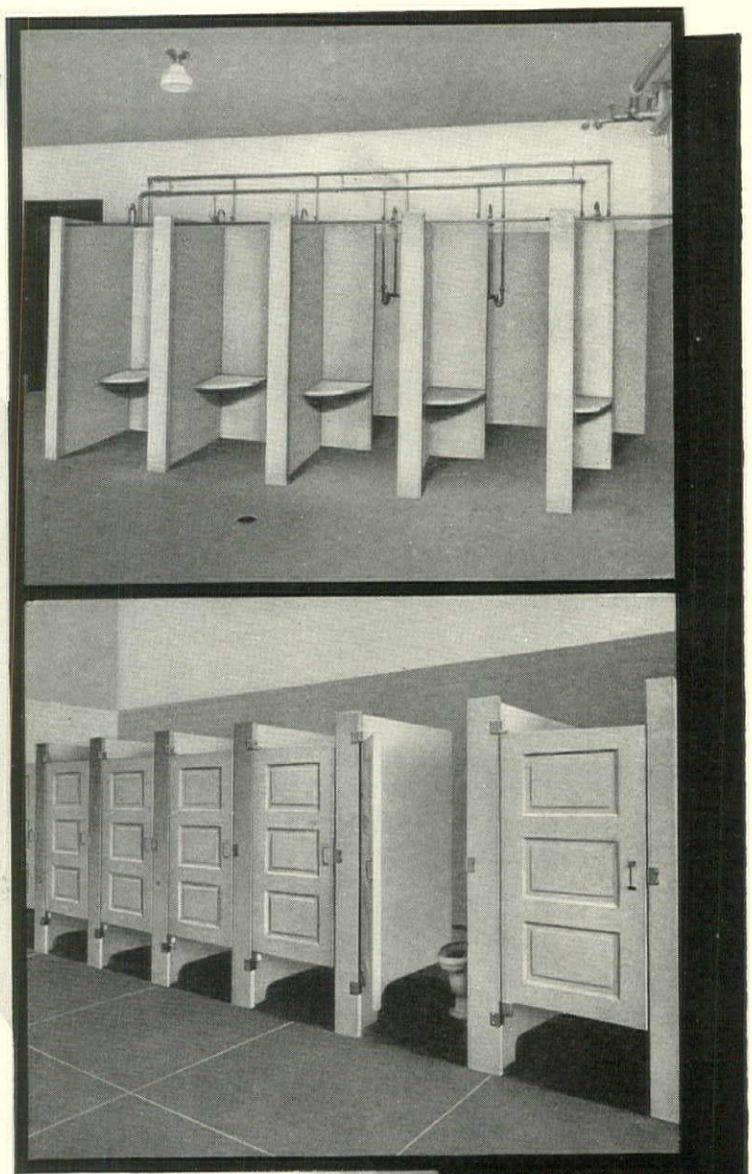


Method of joining partitions and back slabs.



Alberene construction stands the gaff

THE carelessness and rough usage to which shower and toilet rooms in schools are subjected makes it imperative that partitions be durable. Any attempts at economy through the use of materials which are cheaper and which cannot be fabricated properly for the purpose, reacts unfavorably by increasing upkeep costs.

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ALBERENE STONE

TOILET PARTITIONS and SHOWER COMPARTMENTS

ALBERENE STONE TRADE BEST MARK


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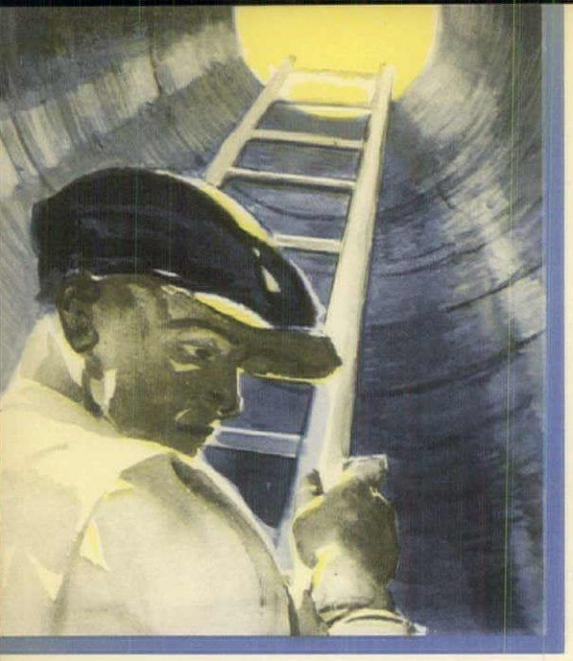

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4 The non-clog impeller is accurately balanced, liberally proportioned, readily reached.

5 There are only two bearings to lubricate.

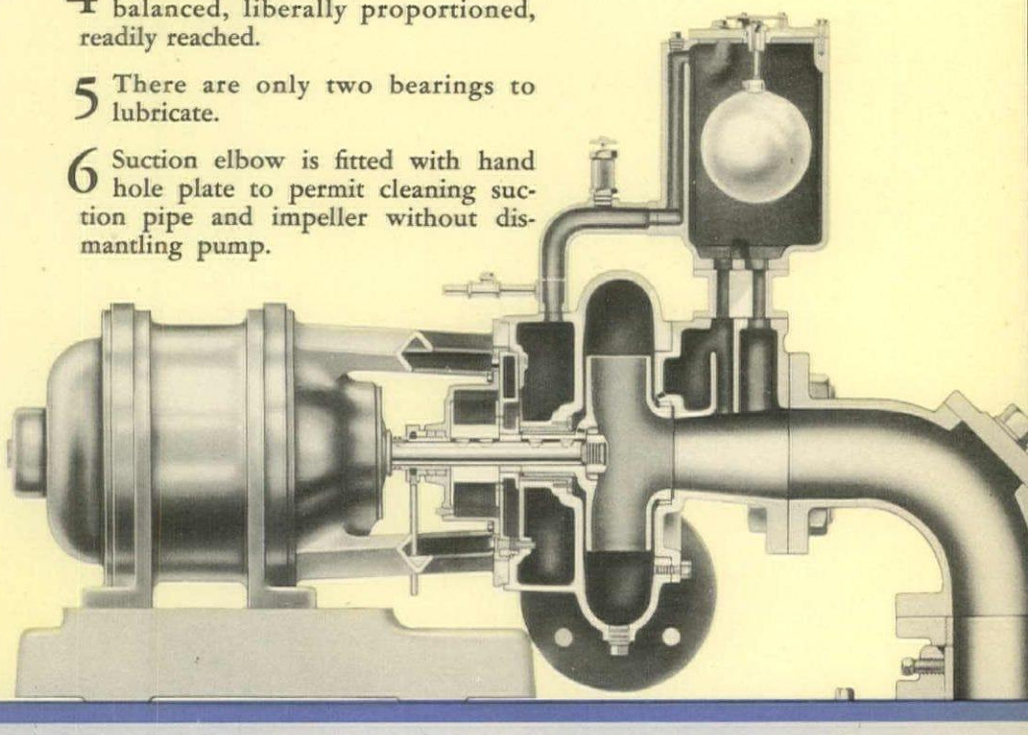
6 Suction elbow is fitted with hand hole plate to permit cleaning suction pipe and impeller without dismantling pump.

7 Priming unit is a simple, sturdy N Hytor.

8 Iron catch basin has gas tight cov

9 Controlling float switch is totally closed and oil immersed.

10 Ball float has adjustable stop.



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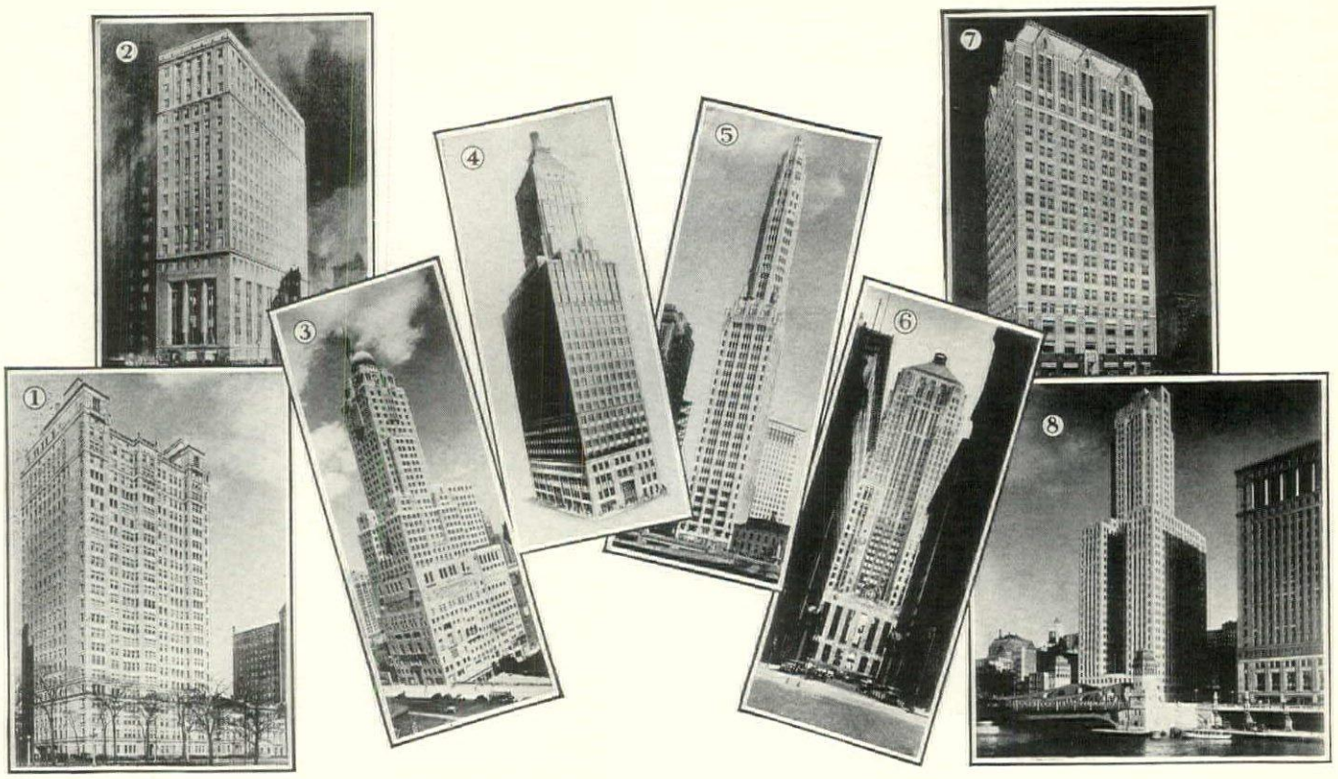

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General Contractors—Turner Construction Company, Chicago
Mechanical Engineers—H. A. Durr & Company, Chicago

2 Chicago Evening Post Bldg., Chicago, Ill.
Architects—Holabird & Root, Chicago
General Contractors—McLennan Construction Co., Chicago

3 Medinah Athletic Club, Chicago, Ill.
Architect—Walter W. Ahlschlager, Chicago
General Contractors—Paschen Bros., Chicago

4 Trustees System Building, Chicago, Ill.
Architects—Thielbar & Fugard, Chicago
General Contractors—McLennan Construction Co., Chicago

5 Mather Tower Bldg., Chicago, Ill.
Architect—Hubert Hugh Riddle, Chicago
General Contractors—R. F. Wilson & Company, Chicago

6 Board of Trade Building, Chicago, Ill.
Architects—Holabird & Root, Chicago
General Contractors—Hegeman-Harris Co., Inc., Chicago

7 10 West Elm Street Apts., Chicago, Ill.
Architects—B. Leo Steif & Company, Chicago
General Contractors—Adolph Lindstrom Company, Chicago

8 La Salle-Wacker Bldg., Chicago
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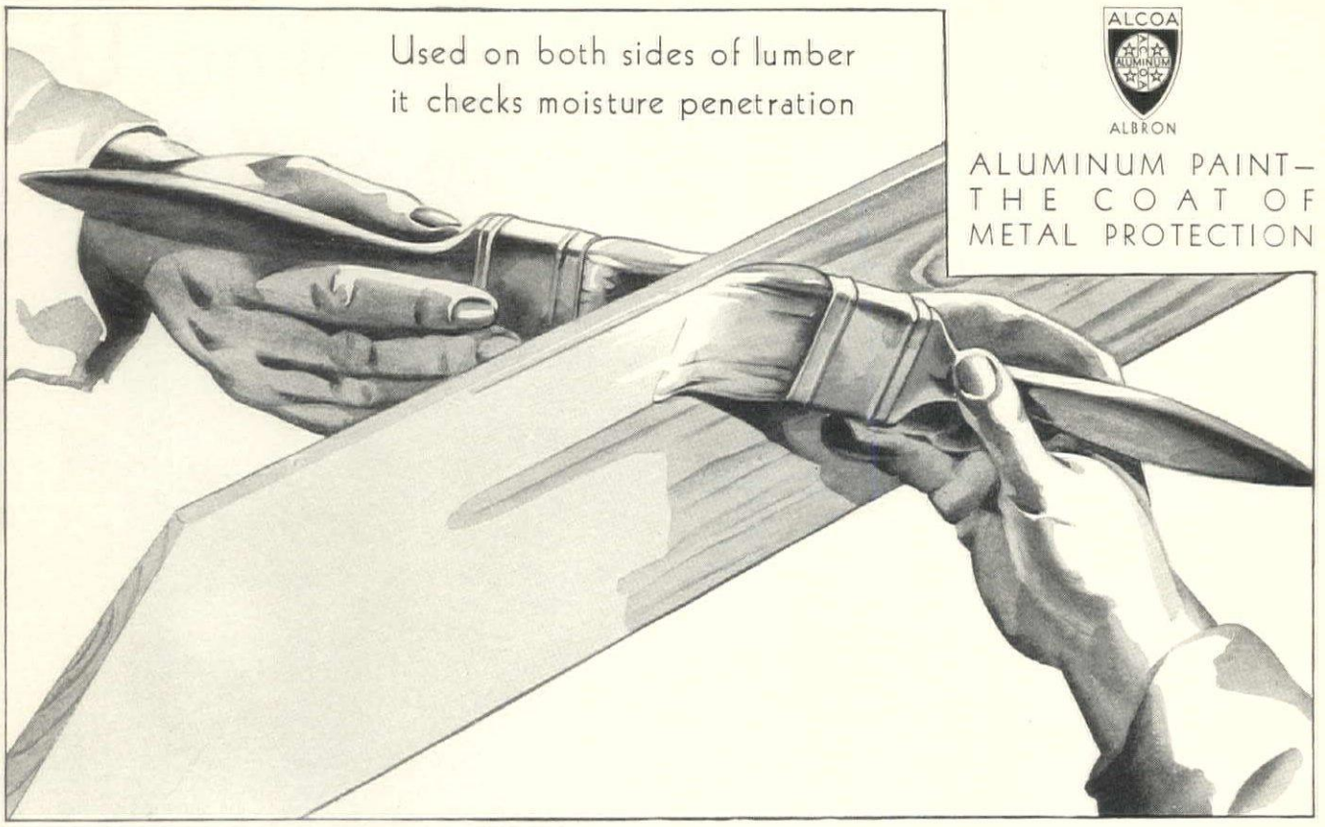

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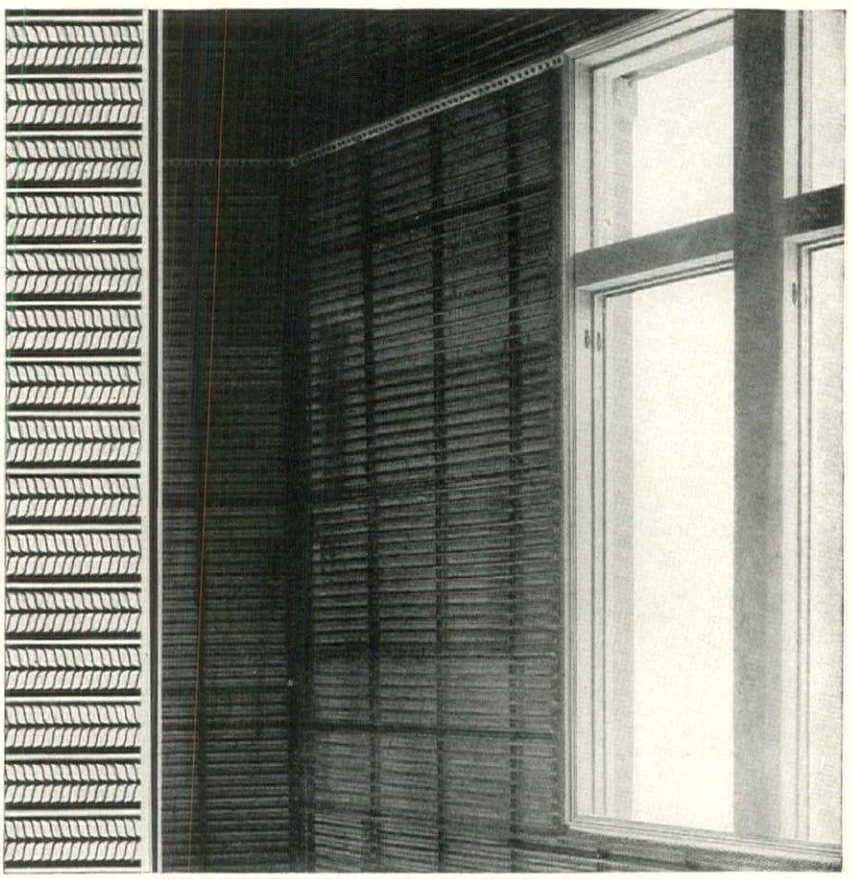

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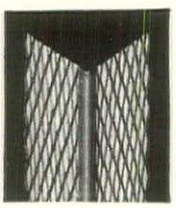

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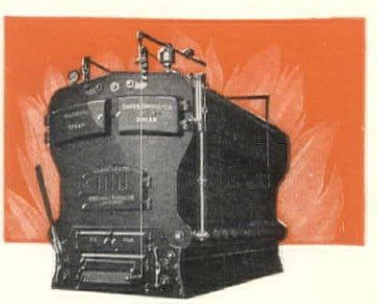

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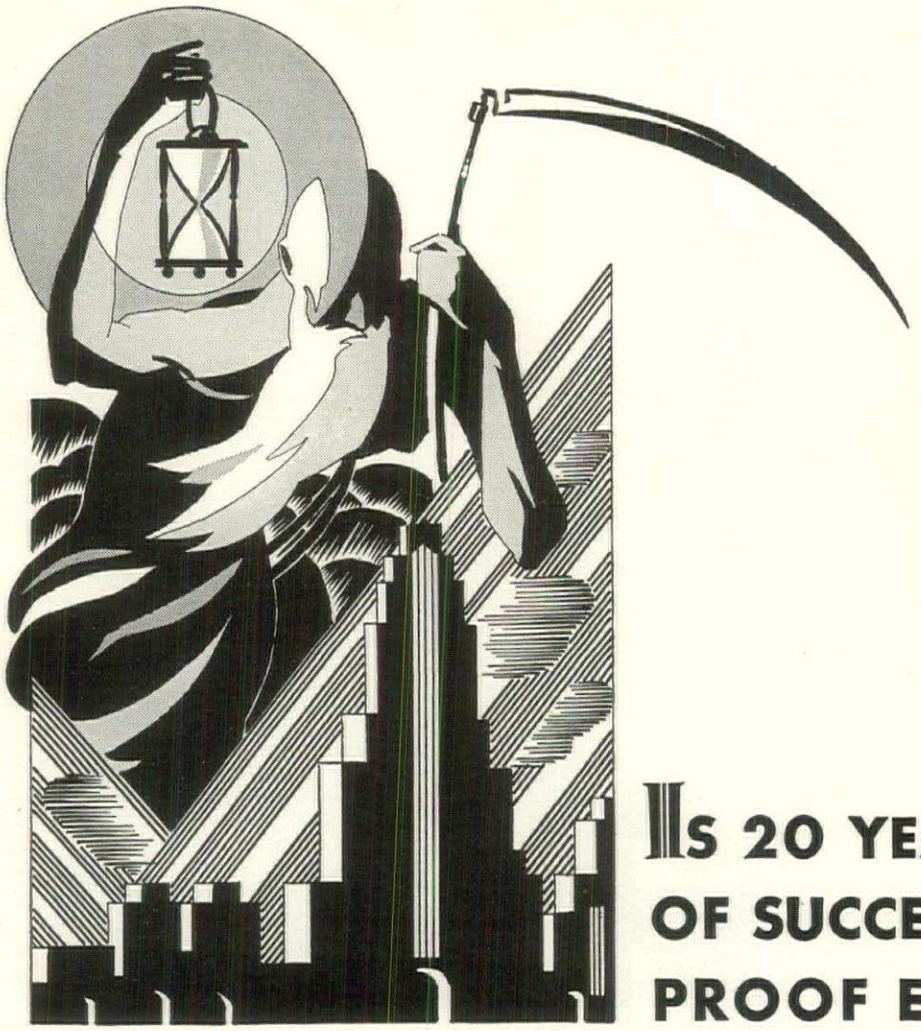

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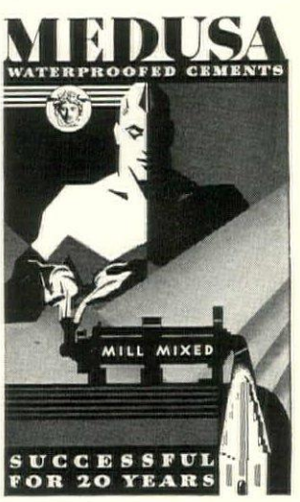

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NO FACTOR of protection is more important in a home than the pipe installed in it. Because it is in constant service and literally buried in the walls and under floors, inferior pipe is a liability which eventually reveals itself in personal discomfort and damaged property. On the other hand, Byers Genuine Wrought-Iron Pipe is lasting security. Install it once and protection is permanent. . . . Architects recognize the superiority of Byers Pipe, and plumbing and heating contractors welcome it. The name "Byers" imprinted in the metal and the famous Spiral Stripe are assurances of Genuine Wrought-Iron Pipe. Initially, it costs more than ordinary pipe because it is extraordinary. But ultimately, because of the constant service and enduring protection, it is most economical. It is a lasting investment for your client—not a temporary outlay. . . . Byers Genuine Wrought-Iron Pipe is a standard specification in better homes today. Its leadership in other fields of service is equally recognized. Wrought-Iron is the only ferrous metal that contains the *Vital Element* (silicate of iron) in sufficient quantity to resist corrosion decade after decade. In Genuine Wrought-Iron, this silicate of iron is present throughout the metal, 250,000 and more rust-resisting ribbons to the square inch. Like the companion-silicate from which glass is derived, this *Vital Element* offers lasting resistance to all forms of corrosion. . . . Remember, "Byers" is the trade name for perfection in wrought-iron pipe. It is readily identified by the Spiral Stripe. If you wish, we will be pleased to send you Bulletin No. 38 which tells more about Byers Genuine Wrought-Iron Pipe and its uses. A. M. Byers Company, Pittsburgh, Pa.

ENDURING SAFETY FOR THE TREASURES OF HOME

BYERS GENUINE WROUGHT IRON **PIPE**

AN INVESTMENT — NOT AN OUTLAY

6 months delay cost me $8690

Too late, I found General Electric Refrigerators DO rent apartments

Like many other apartment owners, I delayed as long as possible in ordering electric refrigerators for my 43-apartment building at Evanston. I did not realize their importance until it was too late.

My loss in rentals which can be directly attributed to a six months' delay in buying General Electric Refrigerators amounted to $8,690.00 or more than the cost of the refrigerators for all the apartments. This is how it happened:

In March, 1929, I had the building full with a waiting list. In May I lost three tenants because I refused to install electric refrigerators, and in October I lost seven more. These vacancies represented the loss of $8,690.00.

Then I installed General Electric Refrigerators.

Now the apartments are fully occupied —my vacancy loss is completely wiped out.

J. N. Lott

by Mr. J. N. LOTT, Apartment House Owner, Evanston, Ill.

Sissilla Apartments 1210-1222 Central St. Evanston, Ill.

Mr. Lott, like thousands of other apartment house owners, has recognized the sound *economy* in installing General Electric Refrigerators. The efficiency, durability, quietness, compactness, attractive appearance and dependability of General Electric Refrigerators mean as much to the apartment house owner, contractor, builder and architect as to the tenant who enjoys their reliable, economical service.

Write us for "Today's Trend in Electric Refrigeration for Apartment Homes." Address Section U-9, Electric Refrigeration Dept., General Electric Co., Hanna Bldg., 1400 Euclid Avenue, Cleveland, Ohio.

Join us in the General Electric Program, broadcast every Saturday evening on a nation-wide N.B.C. network.

GENERAL ELECTRIC

ALL-STEEL REFRIGERATOR

ELECTRIC WATER COOLERS COMMERCIAL REFRIGERATORS ELECTRIC MILK COOLERS

The CRYER VALVE Crier

of the D. G. C. TRAP & VALVE CO., INC., 1 E. 43rd St., New York

Number One NEW YORK, N. Y., MURray Hill 7320 *September, 1930*

New Control Valve Varies Temperatures of Steam Radiators from 90° F. to 212° F.

7 Important Advantages of Cryer Radiator Control Valves

On *all* two-pipe steam heating systems, the Cryer Radiator Control Valve has these advantages:

1. Saves steam by permitting full control of radiator temperatures for mild, moderate or cold weather.
2. Gives steam systems the desirable operating characteristics of hot water systems.
3. Costs no more than ordinary valves.
4. Eliminates trouble on return line by thoroughly preventing escape of steam into return line.
5. Used with any trap on vacuum or gravity systems.
6. No special installation is required —valve comes to the job ready for installation.
7. Valve is attractive and substantial, nickel-plated, and polished on certain parts.

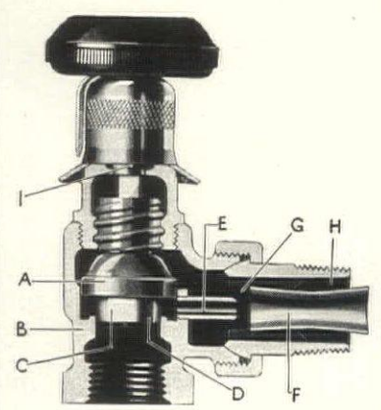
No other valve achieves the effects given by the Cryer Radiator Control Valve, the advantages of which have been demonstrated in the laboratory and in actual use.

Catalog Available

The makers will be glad to send you a catalog completely explaining *how* and *why* the Cryer Radiator Control Valve gives such remarkable results.

Reports of results of engineering tests are also available for the asking.

See address above.



Valve Half Open

How and Why the Cryer Valve is Unique and Better

When the valve is open up to ¾, steam enters the radiator only through the slot D, nozzle E and tube F. The jet of steam shoots out across the top of the radiator, dropping to the bottom and mixing with air and vapor. The incoming steam going from nozzle E into tube F, creates a partial vacuum at G, which pulls the humid mixture back from the first section of the radiator through sleeve H to G. There it strikes the jet of steam and is recirculated. In this way the entire contents of the radiator are continuously circulated, heating the radiator evenly all over to a moderate temperature.

When the valve is opened more than ¾, steam enters through the large port over the nozzle E as well as through the nozzle F, filling the entire radiator immediately with steam at full temperature for heating the room rapidly.

Effects of Hot Water Heating Possible with Steam

Announcement of a new radiator valve which *completely* controls radiator temperatures in all two-pipe steam systems, is made. This effect is obtained by a new, unique method of controlling steam input, combined in the valve with a positive method of circulating the steam, air and vapor continuously throughout the entire radiator. Large fuel savings are achieved.

Combines Advantages

Its makers state that the valve regulates the steam input so that the temperature of the entire radiator may be reduced as low as 90° in mild weather, or run up to 212° in cold weather. In this way the effects and economies of heating with hot water are obtained with the lower first cost of a steam installation in large buildings.

The valve, called the Cryer Radiator Control Valve, gives effects on any type of steam heating system—vacuum, vapor or gravity—not heretofore obtainable, by heating the *entire* radiator evenly at moderate temperatures.

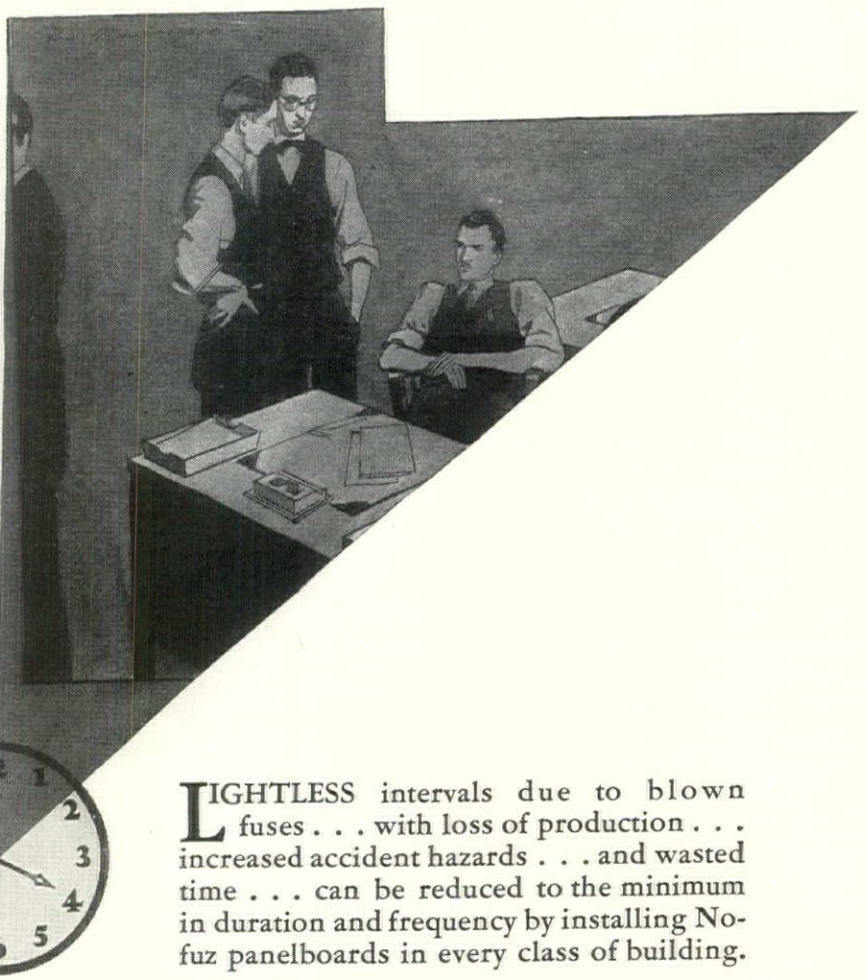
The Cryer Organization

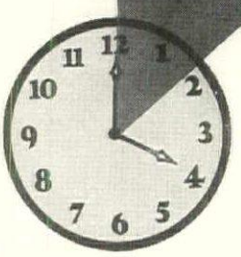
The Cryer Radiator Control Valve is made by D. G. C. Trap & Valve Co., Inc., 1 E. 43rd St., New York City, makers of Cryer heating systems and devices since 1898.

Cryer products have been installed in thousands of buildings all over the world. The Cryer organization has been responsible for many great advances in the art of heating, such as the Cryer Radiator Control Valve.

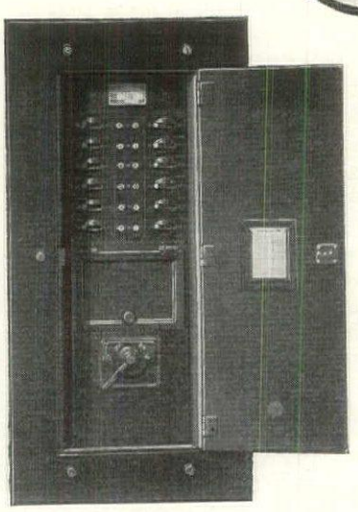
REDUCE Lightless Intervals

with Nofuz Panelboards





LIGHTLESS intervals due to blown fuses . . . with loss of production . . . increased accident hazards . . . and wasted time . . . can be reduced to the minimum in duration and frequency by installing Nofuz panelboards in every class of building.



Overloads that the wiring can carry in safety do not cause the breaker to open the circuit . . . yet the wiring is protected at all times and under all conditions. And when abnormal overloads open the circuit, the nearest worker can restore service with a flip of the breaker handle. There is no danger . . . no live parts are accessible and, if the abnormal overload condition has not been cleared, the breaker will again trip. It cannot be held closed under such conditions.

Further, the breaker calibration cannot be changed; its action cannot be blocked. Every breaker is calibrated and tested at the factory to assure unfailing service for years to come.

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BOOK DEPARTMENT

WIND BRACING FOR TALL BUILDINGS

A REVIEW BY
ARTHUR T. NORTH

WITH the 80-story building here and the 100-story building in plain sight, the subject of wind bracing these high tower structures demands the best methods of designing. The stability of existing and of future towers is not questioned, because they have been designed to provide adequate strength. With these greater heights the rigidity and prevention of disturbing movement during wind storms and greater economy of construction must be accomplished satisfactorily. The rentable value of floor space can be adversely affected by the fears of tenants caused by storms, even though the structure is entirely safe. It is an economic problem pertaining to rental value and cost of construction.

The subject of wind bracing has been befogged and befuddled by a confusion of ideas and too much mathematics. Young engineers are entitled to expect clear thinking and candid opinions from their elders to guide and instruct. "Stock in trade" should not exist in a profession where all have been beneficiaries of the past. Lengthy mathematical discussions are no substitute for sound theory, nor as much to be desired as clarity of thought and expression. To clarify the subject of wind bracing, Mr. Spurr presents an exposition of his yardstick for a rational method of designing. It differs from the generally published and used methods in several respects. The yardstick is given in the suggestions for building codes:

1. "All buildings where the height ratio equals or exceeds 7:1 shall be investigated, and shall meet the requirements as to strength and stability to resist in the structural frame an assumed wind load of 30 pounds per square foot at the top, diminishing uniformly to nothing at grade. This triangle of loading is to be assumed on the entire area of the structure with the wind blowing in any direction. No reduction in the 30-pound wind load shall be made in coming down from the top until a point is reached which is below all spires, peaked roofs or other extensions of the main shaft of the building.

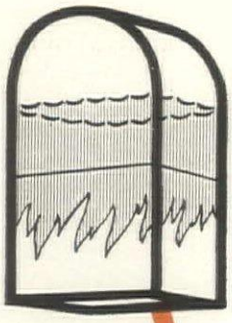
2. "In applying the assumed wind load defined here on the structural frame, the designing engineer shall thoroughly investigate the rigidity of the structures. In all cases the rigidity of the frame shall be such that under this assumed wind load the total deflection at the top of the building shall not be greater than two-thousandths of the height. ($0.002h$) the height being the distance from the base of the building to the highest framed level accessible to the public or the general occupancy of the building. In the analysis of the frame for rigidity, full consideration is to be given to all elements which will cause deflection, such as distortion in beams and columns due to bending under wind stress, distortion in connections, and the deformation in the columns under axial wind loads. The stresses in the various parts of the structure under assumed wind load only shall be such as to meet the requirement of rigidity as stated here. The maximum allowable stresses under wind alone, or under combined live, dead and wind loads, shall not exceed 24,000 pounds per square inch. Beams thoroughly encased in stone-concrete haunches with a minimum of 2 inches of concrete, may be considered to have stiffness increased a maximum of 25 per cent."

It is noted that an allowable deflection of the frame is provided for which is not detrimental to the occupancy of the structure. The nature of vibration and the problem of "elastic behavior" are explained in relation to wind forces and divided into two phases:

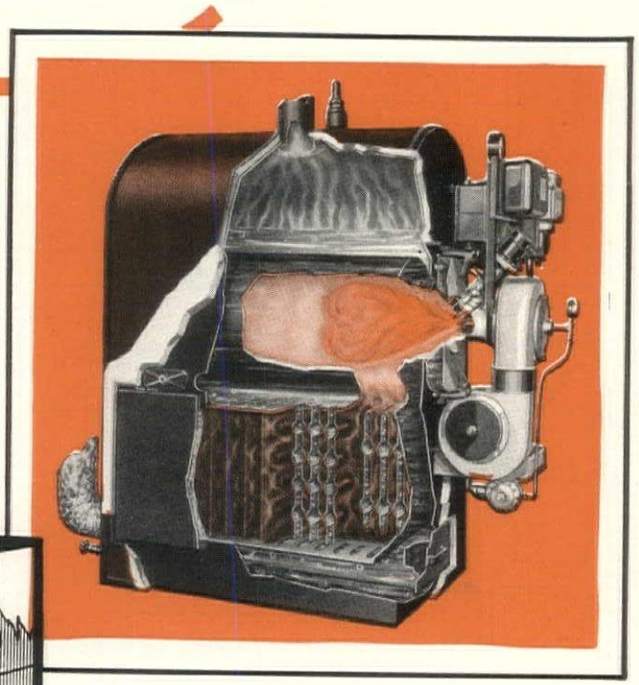
"The first phase which may be considered is the effect of the working of the structural frame on the enclosing masonry and interior partitions. If the frame is too flexible the working of the building may cause damage to the outside masonry by partial disintegration, and produce cracks in the interior partitions. These effects will be proportional, generally speaking, to the amplitude of vibrations.

"The second phase of the problem concerns the effect of vibration on the tenants. There is, no doubt, a combination of amplitude and frequency which becomes unpleasant and may become disturbing. Speaking strictly in a mechanical sense, acceleration should be the important factor, but the author believes that amplitude of vibration is equally important in its effect on the human nervous system. It may be that the 'factor of disturbance' to tenants will vary as amplitude times frequency. Relatively large accelerations on very small amplitude will pass unnoticed, no doubt, and relatively large amplitude would cause little concern if produced very gradually. Experiments will do much to clear this up."

In tall towers, Mr. Spurr favors the use of knee braces and framed panels which effect a reduction in tonnage of about 5 per cent in the frames using only shallow connections. This is a considerable item in the cost of construction. By intelligent planning and coöperation between the architect and engineer, knee braces and framed panels are used satisfactorily. "As a matter of fact, there is nothing particularly pleasing in a straight beam haunch from column to column. Architectural insistence on this condition is silly in a modern high tower, as would be instantly admitted in the nave of a Gothic cathedral. In the latter case the architect has the classic precedent, based on sound construction conceived by artist artisans which has endured, to guide him. Likewise, knee braces in a high tower are particularly fitting



THEY TURNED THE BOILER UPSIDE DOWN



When Garfield A. Wood, famous engineer, business man, and speed boat king, installed an oil burner in his home, he liked its automatic heat but his engineering experience told him it was too costly. He discussed this problem with that prominent engineer and inventor, the late H. M. Jerome, who later interested Prof. W. E. Lay of the Automotive Engineering School at the University of Michigan.

These two scientists studied boilers . . . and found them surprisingly inefficient. The old-type boiler was built for coal firing. Its short, wide flues were not designed to absorb the intense heat generated by oil or gas burners. Consequently stack temperatures were high. Instead of being held in the heating plant the heat was being lost up the chimney.

Boilers had been built that way for many years. That's where the trouble lay . . . they weren't designed for oil and gas burners. So the two engineers did an unheard of thing. They LITERALLY turned boiler design UPSIDE DOWN. The combustion chamber, where the hottest gases are, is located at the TOP of the boiler, toward which the hottest water naturally moves. Only this smallest portion of the water circulates and it alone absorbs over half the radiant HEAT of the fuel. The cooling gases pass downward . . . against the cooler water in the system . . . through flue passages, formed by large, flat water tubes, to the outlet flue located at the very bottom of the boiler. Baffles on the tubes cause a scrubbing action of the gases against the metal, effecting almost perfect heat transfer.

But progress did not stop with the completion of a boiler which delivers a previously unheard-of heating efficiency. A burner equally revolutionary was designed, and the two engineered into the Gar-Wood Balanced Heating Unit. All the interesting details are told in a new book. You'll want a copy . . . so use the coupon, please.

Responsible organizations now distributing through the heating trade should investigate the Gar-Wood franchise. Write the factory for details.

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Gentlemen: Send me . . . without cost or obligation . . . a copy of "A New Principle of Generating Heat at Low Cost."

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Address

City State

as true construction, and pleasing to a trained eye. The day may not be so far away when moderate knee braces may be a favorable item for general advertisement of space by owners in our lofty towers. This seemingly distant day may be materially hastened by rigid architectural insistence against their use in a few lofty structures of critical proportions. In any event, the proper use of deep frames will show material savings in tonnage and field riveting, where equal rigidity is considered in the design. The erection costs of a high tower will reflect a saving of from $2 to $3 per ton, in the author's opinion, with a considerable saving in time.

Mr. Spurr does well to warn architects that the high tower is a specific architectural problem unlike others heretofore known. The insistence of carrying established low-building architectural design practice into high-tower architectural practice may result in a disaster to the investment. This will also be a disaster to the architect who places a "pleasing architectural effect" before sound engineering practice. Architecture must adjust itself, along with structural engineering, to the problems of the high tower. Mr. Spurr has given without reserve and unselfishly from his "stock in trade" acquired by a long and successful experience in designing high towers, some of them equal in height to any yet constructed. His proposed yardstick is worthy of the most careful study and unbiased consideration. It will be provocative of discussion and undoubtedly will be eventually accepted because of the reasonableness of its basic assumptions. He has made a distinct contribution to the literature of wind bracing, doing much to clarify the interminable mathematical hair splitting which is unusable and ineffective for the practicing structural engineers. Structural engineers, architects and builders, —and also the investor of funds in high towers,—can well afford to consider this book. There is much at stake, and we should all proceed with open eyes and minds.

WIND BRACING; THE IMPORTANCE OF RIGIDITY IN HIGH TOWERS. By Henry V. Spurr. 132 pages, 6 x 9, diagrams and graphs, cloth. Price $3. McGraw-Hill Book Company, Inc., 370 Seventh Avenue, New York.

MR. HOLDEN in his introductory text notes the variance between the progress that has been made in domestic architecture and the so-called skyscraper architecture, and he attributes it to the influence of our home traditions, surroundings and habits of life. He sees the appropriateness of our country houses as parts of the surrounding landscape and the incongruity of the modern elemental and embryonic foreign forms of dwelling houses in such surroundings. He finds that we are drawing away from a superficial "period" conception of domestic architecture and are drawing upon tradition only for the best that it can furnish us to interpret function, use and setting. It is encouraging that Mr. Holden finds that where formerly only very large houses were given the attention of the best architects, now the medium and even the small sized houses are beginning to receive the consideration that they merit. He also finds a growing understanding of the subtle relationship between "beauty" and "efficient use."

The illustrations, with floor plans, are drawn from all parts of the country and indicate the influence of climatic

★

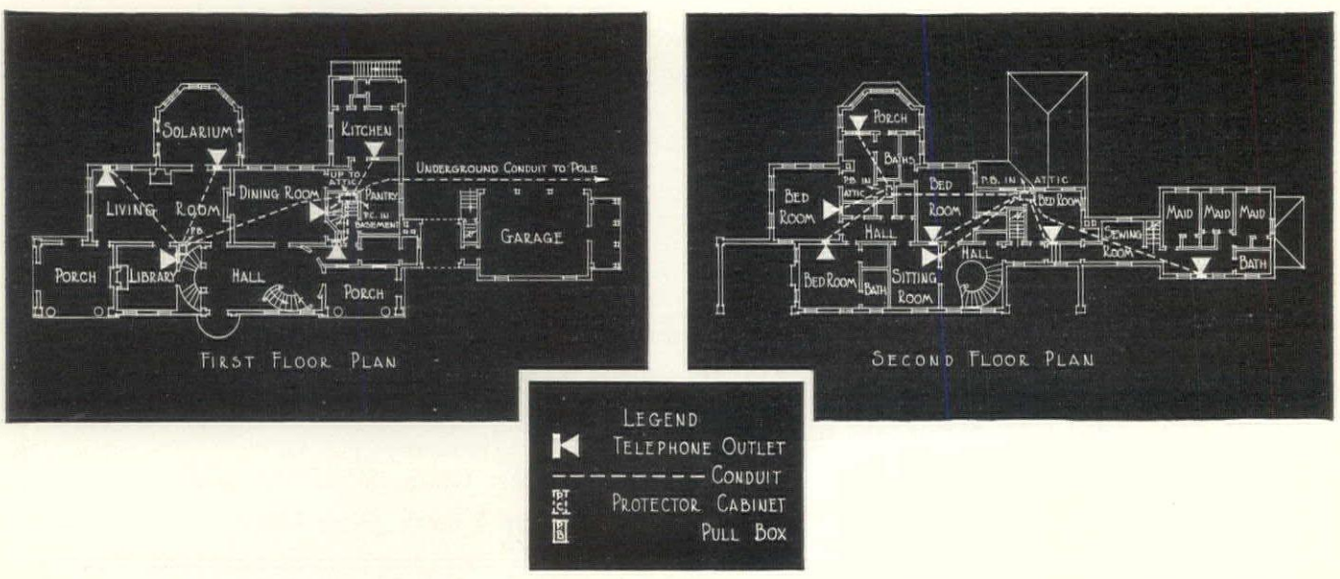
Thirteen telephone outlets, including one in the servants' quarters over the garage, provide for complete telephone convenience in the home of Dr. LeRoy Childs, Tuxedo Road, Atlanta, Georgia. Conduit for the telephone wiring is built into the walls and floors. HENTZ, ADLER & SCHUTZ, Architects, *Atlanta.*

A mark of a well-planned home

AMONG the important features of a home which contribute to the ease and comfort of the occupants is *telephone convenience* . . . that modern note which should be considered in the early stages of planning for a new home or remodeling an old one.

Planning in advance the provision for telephone convenience in a house makes possible the placing of conduit within the walls and floors during construction. This improves the interior appearance by concealing the telephone wiring; insures against certain kinds of interruptions in the telephone service; and provides for complete convenience by making telephone outlets available in all the important rooms. The occupants can use whichever outlets they wish, and can easily expand or rearrange the telephone service to meet their changing needs.

Your local Bell Company will gladly help you plan the telephone arrangements for new and remodeled residences. There is no charge. Just call the Business Office.



conditions, and through it all there are discernible certain qualities which are fundamental. With the great variety of plans and designs illustrated there is always found appropriateness of a uniformly high quality. We have no need to be ashamed of our country houses but rather can rejoice in the freedom of their design, the quality of materials used, and the evidence of skilled workmanship. The country house of today is relieved from the restrictions that seem to inhere in the "grand house" which is modeled on the original conception of a palace. In these less pretentious houses the units are disposed for convenience and are still harmonious in composition. The reader will enjoy the excellent quality of the illustrations and the makeup of this book, and after repeated inspections and study must come to a realization of the versatility, good taste and refinement of the architects whose works are included. It is a fine exposition of representative American country houses.

AMERICAN COUNTRY HOUSES OF TODAY. Compiled by R. W. Sexton with Text by Arthur C. Holden. 203 pages, illustrations, 9½ x 12½, cloth. Price $12.50. Architectural Book Publishing Company, 108 West 46th Street, New York.

PROFESSOR JAGGARD was not only a well known English architect but also a lecturer on construction at the University of London. He was a sincere admirer of brickwork in a country where brickwork attained a high state of perfection. He vizualized using brickwork as a craft, not merely as a trade, embodying artistic handling and sympathetic grouping and finishing, in addition to the conception of stability and durability. Aside from the element of color, the appearance of an unbroken brick wall depends upon the arrangement and bonding of the brick and the character of the mortar joints. With the proper color of bricks a plain wall can be made very interesting as a colored and textural surface. The introduction of arches and projections makes brickwork the most flexible and variable construction. The art of brick construction has been developed in manners characteristic to many countries and, with due regard to the fine brickwork of certain sections of Germany and Holland, the brickwork of England is not surpassed in its appropriateness and beauty.

There is a new interest in brickwork in America, and particularly in New York, and architects are giving great attention to its possibilities, especially in its more finished uses. Granting the picturesqueness of a certain uniformity of color and placing affected in smaller structures such as dwellings, the great sizes of our brick skyscrapers demand a treatment that does not detract from the dignity of mere bulk. In this respect the English methods of bricklaying are more adaptable to our large building needs than those of the continent. For that reason, this volume should appeal particularly to those American architects who are interested in this type of construction; but it should not be assumed that the English methods are not equally appropriate for American dwellings.

BRICKWORK AND ITS CONSTRUCTION. By Walter R. Jaggard. 317 pages, 5½ x 8½ inches, illustrated, cloth. Price $6. Oxford University Press, 114 Fifth Avenue, New York.

Typical Experiences with Oil-Fired HEGGIE-SIMPLEX Jacketed Boilers

75° Day and Night For Only $120 Per Season

"With a Heggie-Simplex Residence Boiler, my fuel consumption for the past winter has been only 2,000 gallons of fuel oil, which at 6c per gallon cost $120.00. I am heating an eight-room home and a large double garage to a temperature of 75° day and night."

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Oil Consumption 20% Under Government Estimate

"The Heggie-Simplex Boiler which was installed in my residence last year is operating very satisfactorily. As this was installed in a new home, I, of course, have no comparative data, but I do know that the oil consumption was more than 20% under the estimated quantity based on government figures for this locality."

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12 Rooms, Baths, Studio and Garage on 3,000 Gallons

"My residence consists of twelve rooms, two baths, two toilet rooms and basement. The garage accommodates two cars and has a three room studio above. In addition to keeping the house, studio and garage at the proper temperature, the Heggie-Simplex Boiler also supplied all of our hot water.

It was very economical to operate. Although the past winter was one of the most severe, only three thousand gallons of oil were used."

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"Our Heggie-Simplex Jacketed Steel Boiler has given splendid results. My residence contains nine rooms, a basement and two bath rooms. The heating plant gave wonderful service, particularly during the severe, cold weather. It provided our hot water as well as heat. It was fired by an oil burner which used only two thousand gallons of oil for the entire season."

A. V. Lawless, Flossmoor, Ill.

850 Ft. of Radiation Kept at 78° for $135.00

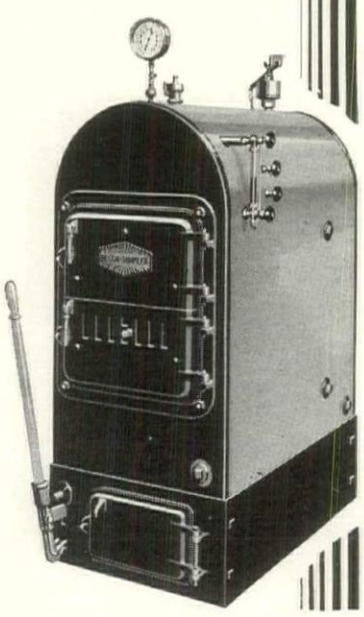
"During the last heating season, with a Heggie-Simplex Boiler, the total cost for oil was $135.00. I have installed in my house 850 feet of hot water radiation and I consider this consumption very low, particularly so as I have kept the house at all times in the neighborhood of 78°. The Boiler has cost nothing for repairs and has been most satisfactory."

W. H. Gibbs, Glenbrook, Conn.

Cut Fuel Cost 25% With Oil

"During the season of 1928-1929 in my old boiler, we burned eight tons of coal. This winter, the Heggie-Simplex Boiler showed a 25% saving in fuel costs. It is the best investment I ever made in my house. Incidentally, the oil burner manufacturer was very pleased when told that his burner was to be installed under a Heggie-Simplex Boiler."

Frank A. East, West Roxbury, Mass.



Heggie-Simplex Jacketed Boilers are constantly proving money-saving investments for owners of residences and small buildings. Their much larger combustion chamber gives any fuel—oil, gas, coal or coke—more room to burn. More heating surface is in direct contact with the fire; heat is absorbed faster. Numerous tubular flues, with an exceptionally large area of heating surface, unrestricted circulation and the *jacket's mineral wool* lining assure complete utilization of all heat units.

Of welded steel construction, the Heggie-Simplex Jacketed Boiler is crack-proof and leak-proof—a particularly important safeguard in automatic firing!

For details write Heggie-Simplex Boiler Co., Joliet, Ill.

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THE ARCHITECTURAL FORUM

VOL. LIII, NO. 3 — SEPTEMBER, 1930

CONTENTS

APARTMENT HOUSE REFERENCE NUMBER

PART ONE—ARCHITECTURAL DESIGN

PART TWO—ARCHITECTURAL ENGINEERING AND BUSINESS

THE ARCHITECTURAL FORUM is published monthly by Building Division, National Trade Journals, Inc., 521 Fifth Avenue, New York, H. J. Redfield, Chairman of the Board and Treasurer; Howard Myers, President and General Manager; John Thomas Wilson, Vice-President; James A. Rice, Vice-President; C. Stanley Taylor, Vice-President; Henry J. Brown, Jr., Secretary.

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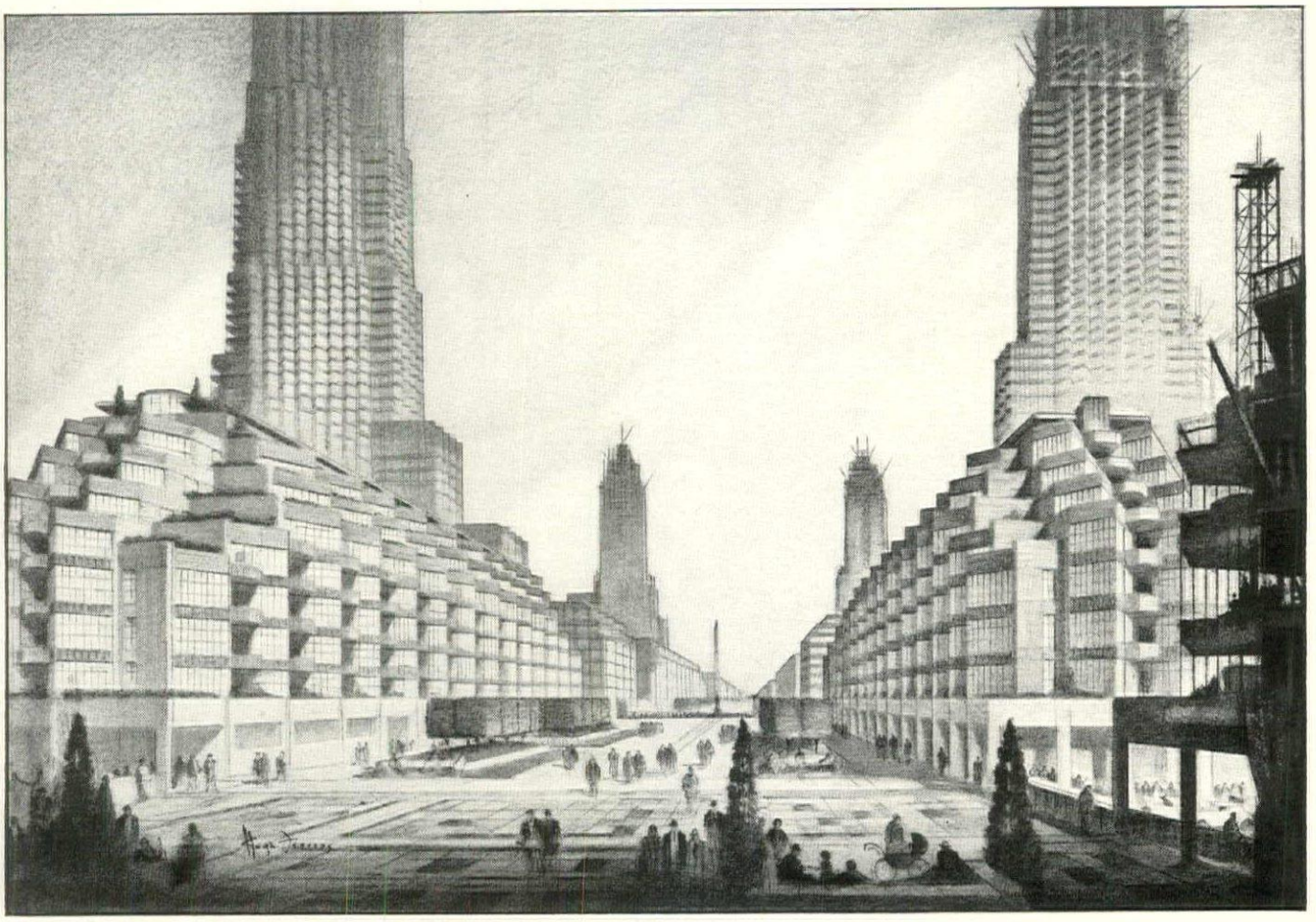
STRUCTURAL STEEL CREATED THE SKYSCRAPER

STEEL GIVES DAYLIGHT A CHANCE



"APARTMENT HOUSES OF THE FUTURE." IN THIS IMAGINATIVE DESIGN BY HUGH FERRISS A PROMENADE BRIDGES VEHICULAR TRAFFIC. AN ENLARGEMENT, ON SPECIAL STOCK FOR FRAMING, WILL BE MAILED WITHOUT CHARGE TO ANY ARCHITECT, ENGINEER OR BUSINESS EXECUTIVE

MIGHTY, modern, adaptable steel . . . it stands alone, needs no bolstering—and when unconcealed by weaker materials brings light and air and majesty to cubist mass, to lance-like tower.

Windows, which in the fledgling skyscrapers were mere slits through heavy masonry, have grown in size and number. Tomorrow, curtain walls will yield to solid-section steel windows, to sheets of glass through which even ultra-violet rays may pass.

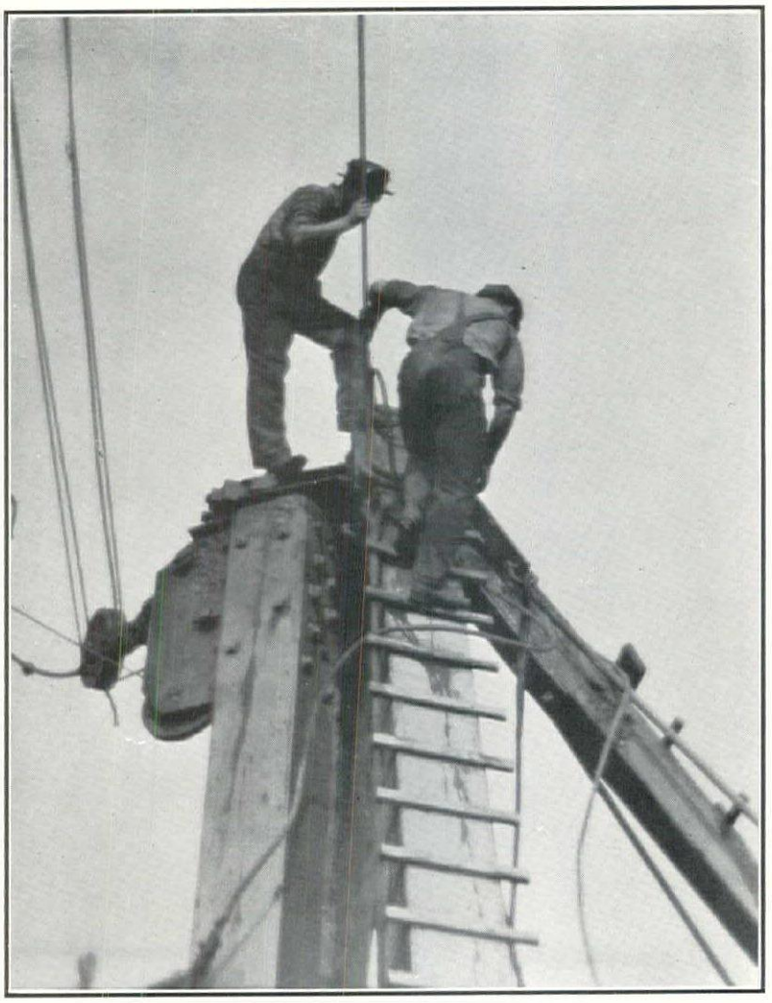
In small as well as large structures, steel is an ally of daylight, of speed, permanence and economy. It permits the most practical design for homes, schools, apartment or mercantile houses, industrial plants and small bridges. Steel has less bulk, greater strength than any other fire-resistive material. It secures more floor space; saves building time and labor; facilitates alterations, additions, removal.

Before building anything, find out what steel can do for you. The Institute serves as a clearing house for technical and economic information on structural steel, and offers full and free co-operation in the use of such data to architects, engineers and all others interested.

The co-operative non-profit service organization of the structural steel industry of North America. Through its extensive test and research program, the Institute aims to establish the full facts regarding steel in relation to every type of construction. The Institute's many publications, covering every phase of steel construction, are available on request. Please address all inquiries to 200 Madison Avenue, New York City. Canadian address: 710 Bank of Hamilton Bldg., Toronto, Ontario. District offices in New York, Worcester, Philadelphia, Birmingham, Cleveland, Chicago, Milwaukee, St. Louis, Topeka, Dallas, San Francisco and Toronto.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION

STEEL INSURES STRENGTH AND SECURITY



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CONSTRUCTION AND MAINTENANCE

BY
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A GROWING interest in housing problems has found its echo in numerous articles in the architectural press, illustrating housing projects, both those consisting of individual dwellings and those in urban centers having multi-family houses. They illustrate well the general principles of group planning, layout of units, and exterior design, but there are a host of problems encountered in the actual execution of a housing project which they do not touch and which vitally affect the economy of construction and subsequent maintenance. These notes may, therefore, prove of interest to those working in the field of housing. They are the result of experience with a large housing project recently carried out in Chicago,* covering a block 362 feet by 594 feet and comprising 421 apartments. They touch phases of both planning and specifications, and are presented as itemized problems without any attempt to form a coherent story. Where possible, there are given the pros and cons of methods adopted, and the materials used are named.

FIREPROOF CONSTRUCTION. The Chicago building code requires fireproof construction for apartment buildings more than three stories in height. As this project consists of five-story buildings, it is completely fireproof. Had it been erected in New York it could have been built at a saving of ten cents per cubic foot. This cost translated into rental would mean a saving of about $7.50 per month for a four-room apartment, with rooms of the average size used in Michigan Boulevard Gardens. This saving is predicated on the supposition that the same layout, with rooms of similar size, can be obtained in an equal area in both ordinary and fireproof construction. As a matter of fact, however, non-fireproof construction requires a greater area for a given layout, and this tends to reduce the difference in cost and rental.

Some of the compensating advantages of fireproof construction are these. In ordinary construction, 12-inch walls would have been required around the stair halls; with plaster on one side the total thickness would be 13 inches. The partitions used finished 4½ inches thick. To have the adjacent rooms of similar sizes, the former type of construction would require an additional 17 inches in length of outside wall for each staircase. With 29 stair halls, 41 feet were saved. Translated into cubage this represents nearly 40,000 cubic feet. Where the plan requires offsets in the stair hall with long landings at the floor levels, the advantage of fireproof construction is obvious. Partitions surrounding the floor landing are readily placed on a continuous fireproof slab and if necessary can be varied from floor to floor. Nor is the same degree of accuracy required in locating doors to apartments, as the hall partitions may be installed after the interior partitions are set.

With a completely fireproof construction, metal, self-closing doors to all apartments, the stairs carried from ground to roof and a continuous roof permitting exit from one stair-head to any other, the customary requirement of a second stair exit from every apartment was waived. In Chicago this second stair is usually an outside wooden structure reached from the kitchen. In addition to the saving in cost, its omission permitted a much greater flexibility in planning. Kitchens could be placed anywhere, front or back, without marring the appearance of the building.

In ordinary construction cross fire walls are necessary at intervals. If they run straight across the building they hamper flexibility in planning. It is frequently advisable to interlock rooms of apartments in the length of a wing, causing an offset in the division between two adjacent units. With a masonry wall this is expensive, with fireproof partitions it is comparatively inexpensive. Again the thickness of the wall makes a differ-

* Michigan Boulevard Gardens, Eugene H. Klaber and Ernest A. Grunsfeld, Jr., Architects; Henry Wright and Associates, Consultants.

ence in the aggregate cubage of the buildings.

Under favorable conditions some saving may be made in fireproof construction in the finished thickness of the floor construction. If we leave out of consideration the greater resistance to spread of fire and vermin, and the elimination of wood shrinkage, there is still much to be said for the use of fireproof construction, even where local ordinances do not demand it.

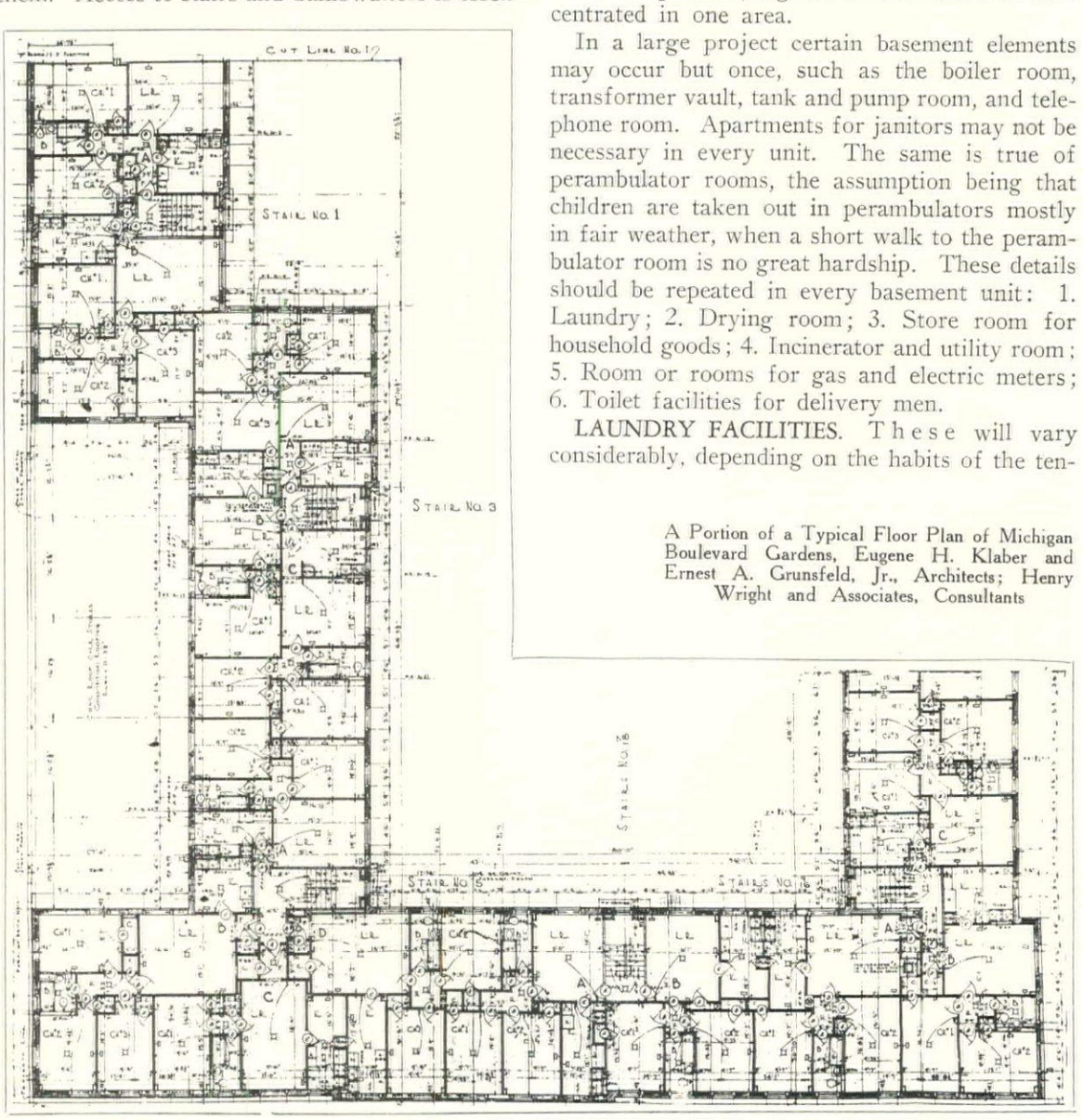
THE BASEMENT. This floor is the servant of the upper stories, and as is frequently the case with servants, its life is warped to conform with the requirements of the family upstairs. An economical layout is very difficult to obtain. Columns, plumbing pipes, staircases and dumbwaiter shafts are laid out for the best convenience of the upper floors, and the servant downstairs must accept them and make the best of them. Access to stairs and dumbwaiters is essential and usually cuts up the plan into comparatively narrow units.

In a small building with one staircase and one or two dumbwaiters, the solution of the basement plan is more or less indicated; where the basement is continuous and reached by a series of stairs, the problem is more complex. Certain principles may, however, be observed.

The basement unit should be as large as possible without causing too long a walk to any of its functions. If incinerators are charged in the basement, one stack can serve many apartments as well as a few. Only one toilet for delivery men is necessary for each unit, and one delivery entrance, again pointing to the advantage of the large unit. Laundry, drying room and store rooms arrange to better advantage and do not require the same percentage of surplus allowance. As far as possible, a given service should be concentrated in one area.

In a large project certain basement elements may occur but once, such as the boiler room, transformer vault, tank and pump room, and telephone room. Apartments for janitors may not be necessary in every unit. The same is true of perambulator rooms, the assumption being that children are taken out in perambulators mostly in fair weather, when a short walk to the perambulator room is no great hardship. These details should be repeated in every basement unit: 1. Laundry; 2. Drying room; 3. Store room for household goods; 4. Incinerator and utility room; 5. Room or rooms for gas and electric meters; 6. Toilet facilities for delivery men.

LAUNDRY FACILITIES. These will vary considerably, depending on the habits of the ten-



A Portion of a Typical Floor Plan of Michigan Boulevard Gardens, Eugene H. Klaber and Ernest A. Grunsfeld, Jr., Architects; Henry Wright and Associates, Consultants

ants. In this case the tenants are colored, and as a large proportion of colored women do their own washing, ample provision had to be made. Each unit laundry contains one pair of wash tubs, one three-burner gas plate, and one section of gas dryer for every 7½ families served. As some of the tenants prefer air drying to gas, a separate room is provided for this purpose as well as a small room for storing privately-owned washing machines. A line is run from each private gas meter to a manifold in the laundry. When the gas is turned on it flows to a given gas drier and gas plate. Thus the tenant uses her own gas supply. The supply cock can be locked shut with a padlock on the handle, preventing use by others, and when the gas is on, the lock can be transferred to the dryer, so that a woman can leave her clothes drying without danger of theft. In actual practice it has been found that very few of the tenants own washing machines, and it is questionable whether a storage room is essential.

STORE ROOMS. Individual store rooms were considered, but abandoned in favor of the common room. If a tenant has a separate room, of which he only has the key, there can be little question of the owner's responsibility in case of loss; there is also less danger of the spread of vermin. On the other hand, the cost of installation is considerable, and the space consumed is greater than for common rooms. Most families of small means have little surplus furniture, and half of the rooms would be empty. These considerations prompted the scheme adopted. The janitor is the custodian of the key, and no one enters except in his company. Goods removed are receipted for. An allowance of 30 square feet of area per family was made and seems to be ample.

INCINERATORS. Disposal of garbage presented a serious problem. There are two usual methods. In one, the incinerator has an opening on each floor and the tenant empties the garbage into the hopper on his floor. This has the advantage of eliminating service, and of giving quick removal of waste from the kitchens. Its drawbacks are several. There must be an incinerator stack for every staircase; the space consumed is considerable; and if there are only two apartments per floor, the cost per family is excessive; the odor of garbage is likely to pervade the stair hall, as hoppers are sometimes left open and tenants occasionally are careless in dumping their pails. The second scheme was preferred in this case. Garbage is kept in a ventilated container built in the outside wall, until collections are made. The can is then placed in a special metal container under the dumbwaiter car and sent down. The attendant in the basement travels from one dumbwaiter to another, wheeling a truck. As the collections are made he replaces the full can on the dumbwaiter with a clean empty can. When full, the truck is wheeled to the utility room, where the contents of the cans are thrown into the incinerator and the cans scoured at a sink. This system necessitates dumbwaiters and periodic service furnished by

National Photo

Garden Court, Michigan Boulevard Gardens

National Photo

Simplicity and Consequent Economy are Shown in Michigan Boulevard Apartments

the landlord. On the other hand it is cleaner. It requires fewer incinerators. As many as 55 families are served by a single stack in Michigan Boulevard Gardens. As no access is required above the basement, the incinerator stacks may be located in the "blind corners" of the plan, wherever space is available.

METER ROOMS for gas and electricity are essential. Whether to have one room for each basement unit, or one at or near each staircase is a moot question. The former arrangement lengthens the average branch service line up to the apartment, the latter lengthens the average run to the manifold in the laundry.

Toilet facilities for delivery men are essential in cities where public comfort stations are infrequent. They prevent considerable nuisance. It is also well to have a toilet in connection with the laundries in large units where women work for a considerable time at a distance from their apartments.

STAIR HALL PARTITIONS. The walls of stair halls are always a problem, the more so in a building in which all furniture must be carried up and down the main stairs. To avoid the constant cost of cleaning fingermarks and repairing the chipping of plaster caused by moving furniture, a material had to be found which is readily cleanable and which withstands abrasion. Brick walls would have required 8 inches of thickness, and unless glazed they are hard to keep clean.

The material adopted was a salt glazed vitrified tile block, with rounded corners and having the back scored to receive the plaster. The advantages of this material are its thinness, pleasant color, and glaze. The halls are cheerful and the light carries well to the rear. The difficulties likely to be encountered are these: The block is produced in a kiln, and the color varies with its position in the kiln. Uniform color on a block and avoidance of flashed colors are difficult to obtain, and to get them means vigilant inspection and rigid insistence that the material man furnish what is wanted. The material is difficult to cut, and no pipes can be run in the partitions. Shelf angles must be bolted to the concrete to carry the surface continuously past the floor levels. If delivery is not made promptly, plastering will be delayed in the rooms adjacent to the stair hall.

FLOORING. Two principles should be observed in determining the finished floor material in a fireproof building: (1) Avoid excessive thickness between the rough slab and the finished floor. (2) The thickness should be uniform in all cases so that the slab may be poured at a single level throughout.

With sleepers underneath the wood floors a thickness of 2½ inches is required between the rough and the finish. About the same dimension is necessary where tile floors are installed in bath-

rooms and terrazzo in hallways. The adoption of materials in all three locations which would finish ¾-inch thick above the rough slab saved 1¾-inch per floor, or 8¾ inches in the total height of the building; multiplied by an area of about 70,000 square feet resulted in the saving of approximately 50,000 cubic feet.

The materials used were these: In the stair halls, stair treads and bathrooms, a composition consisting of magnesite with marble chips as a wearing surface, which when ground is ¾-inch thick. In rooms, closets, apartment foyers and halls, a wood floor was laid, of oak in squares made up of pieces 2¼ inches by 9¾ inches, or 13 inches. Adjoining squares had the boards running in opposite directions, thus making a basket-weave pattern. This flooring is attached to the floor by dipping the bottom surface of the boards in asphalt.

Some difficulties have been encountered. Wood floors must be carefully dipped so that the asphalt does not get above the tongue, otherwise a liquid filler will bring the asphalt to the surface in the cracks. When these floors expand, due to moisture, the expansion can be taken care of by leaving an open margin under the shoe mould. This expansion occurs evenly over the whole floor. When the boards contract there is no general pulling back, but the contraction is likely to show as an open crack at any point. When the flooring is brought into a building that is still damp there is a certain swelling across the grain. This means that the resultant panels are not exactly square, and gives rise to irregularities at the meeting of the squares. Unless great care is exercised in laying, this may result in open holes between the squares, sometimes as large as a lead pencil.

Magnesite terrazzo should not be used with a dark background. There is salt in the composition which shows as a white efflorescence on any dark background. By repeated washing the salt may be removed, but it greatly mars the appearance while it persists.

PLUMBING FIXTURES. In speculative projects intended for quick sale it is customary to skimp the quality of the concealed work and have the trimmings showy but unsubstantial. Large housing projects are seldom sold; the owner must therefore consider the question of upkeep very carefully. Brass goods must be of the best quality with as few movable parts as feasible. Faucet seats should be readily removable. Handles and escutcheons should be metal, not china. The latter need constant replacement. For tubs with showers above it is advisable to use a combination fitting with one cold water valve, one hot, and a diverting valve to direct the united stream either into the tub or to the shower. This means three moving parts instead of the customary five. Mixing valves are expensive and may frequently get out of order. Any form of standing waste on bath tubs is a source of trouble and most of them require an access panel. A heavy rubber plug with a strong chain is about as satisfactory as anything. In the worst case, if lost they are readily replaced.

To avoid the cost of individual shut-offs for each fixture, a pair of valves may be installed controlling the water of each apartment. This permits making repairs on a given floor without losing the use of other bathrooms and kitchens on the same stack. Good toilet seats are a sound investment. Exposed metal parts are subject to verdigris. This can be avoided by having all brass work covered with vulcanized rubber. In kitchens a combination sink and wash tray with movable drain board and swing spout faucet is advisable. It permits light laundering of perishable fabrics in the apartment and relieves the demand for use of the cellar laundry.

ELECTRIC METERING. In a large project it is possible to make the purchase and sale of electric current a source of income by having a master meter, buying the current at wholesale rates and charging the tenant the retail rate. If this is done the landlord must buy and install the apartment meters, he must read them, send bills, and collect the money. In addition to the cost of these services, there are likely to be bad debts and disputes with tenants over the correctness of the reading. If the tenant has contracted with the power company and does not pay his bill, his supply is shut off, but there is not the same bad feeling as if the landlord were to do the same thing, under the same circumstances.

It is hoped that these paragraphs may prove of value to those of the profession who are engaged in the arduous struggle with the housing problem, and that they will prompt others to add their contributions setting forth their experience.

FINANCING COÖPERATIVE APARTMENTS

BY

LOUIS G. KIBBE*

THE financing of coöperative apartment buildings calls for the utmost in conservatism, for whereas in the case of a rental operation the builder is the only one who suffers loss in the event of failure, in the case of a coöperative apartment project any loss through foreclosure might fall upon the tenant owners. Fortunately the promoters of these projects in New York City have exercised commendable judgment in their financing, and as far as I know, no tenant owner of an apartment in Manhattan has ever suffered a loss from this source.

Broadly speaking, there are three acceptable methods of financing apartment buildings of the rental and coöperative types:

1. By what are known as institutional loans—that is to say, loans made by such institutions as life insurance companies, title companies and savings banks, the amount of the loan ranging from 50 to 65 per cent of the appraised value of land and building.
2. By means of a bond issue, usually in an amount representing approximately 75 per cent of the value of land and building.
3. By either a bond issue or an institutional loan, supplemented by a second mortgage, this method being used extensively in financing rental and semi-coöperative buildings.

In some of the western cities, notably Chicago, where there is not free access to institutional funds such as those described in plan 1, the promoters have been forced to utilize the bond issue method. However, in New York City this method is seldom used, practically all of the cooperative apartment projects having been financed by institutional loans.

Taking the three plans in the sequence just named, the advantages and disadvantages may be stated somewhat as follows:

1. *Advantages.* The initial cost of financing is much less than under any other plan, averaging 2½ to 3½ per cent of the amount of the loan. The interest rate is also the lowest available in the market, being as low as 5 per cent in normal times and seldom exceeding 5½ per cent. Because of the fact that in a coöperative project these loans are usually less than 50 per cent of the sales value of land and building, and of the care usually exercised by the promoters in the selection of the site, the annual amortization is considerably less than in any other type of financing. These savings contribute notably to the success of the project, being reflected,

1st, in the sales price of the apartments, and

2nd, in the annual charge for maintenance, frequently referred to as proprietary rent.

These institutional loans have an average maturity of about five years. Where amortization is not demanded by the lending institution, provision should be made for the creation of a sinking fund for the purpose of paying off part of the mortgage at its maturity, thereby insuring refinancing at a minimum cost.

The difference between the amount of the mortgage and the sales price of land and building is referred to as "equity" and in the case of cooperative apartments must be supplied by the purchasers of the respective apartments, with due consideration to the size, location, etc., of the apartment units. Obviously, the purchasers are called upon to pay more in cash for their apartments where the initial financing is in the form of an institutional loan than would be the case when a bond issue is involved. This condition represents about the only objection that can be given to the use of institutional loans and is more specious than real; moreover, the objection can be overcome completely by providing for term payments by the individual purchasers of the apartments, thereby insuring sound financing of the building and at the same time affording a convenient means for financing the equity payments.

Plan 2. The only appeal that this plan offers is in the reduction of the equity cash to be supplied by the individual purchasers, but the attendant disadvantages are so pronounced that this means of financing is seldom resorted to where institutional funds are available. The initial cost of a bond issue averages 8 to 10 per cent of the amount of the loan—the interest rate averages 6 per cent —sometimes even 6½ per cent being charged—while the annual amortization runs around 2 per cent to 3 per cent. These factors are reflected in the initial cost of the apartments and in the annual maintenance charges.

Plan 3 combines a first and second mortgage in the financing and should never be used in connection with coöperative apartment projects unless the second mortgage runs for a sufficient term of years to permit complete liquidation at maturity. A short term second mortgage in a considerable sum, maturing before liquidation can be accomplished, is a distinct hazard and may cause serious embarrassment through the necessity of refinancing at maturity.

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A CHECK LIST OF FEATURES THAT MAKE APARTMENTS POPULAR

BY

J. O. DAHL

THE quickest and most certain way to bring back to normal the building of apartments and apartment hotels is to design structures to meet the price ranges and comfort specifications of people who now live in one- and two-family houses and obsolete multi-family dwellings," said a builder whose developments are meeting with success.

"People often speak with sarcasm of homes which, in their estimation, are built to sell," he continued. "Personally, I make an obvious attempt to have every one of my structures built to sell. This doesn't mean that I don't put honest materials and workmanship into my buildings. But it does mean that I consider the factors of style, color and luxury to the same degree as do the mechanical and sales engineers.

"The average motorist buys a new car every year or two. The average apartment dweller, especially in the larger cities, moves as frequently. But my problem is greater than that of the motor manufacturer, because I can't get high enough rentals to justify scrapping my investment when my original tenants move out. What I have done is to look ahead at least five years and include the most modern features, and at the same time plan for enough flexibility to add later improvements as they come along. With the addition of such sales features and by maintaining my buildings in good condition, I am able to keep some of my tenants longer than usual, and to get new ones without a great deal of difficulty."

Women invariably cast the deciding vote in the selection of a home is the report from every rental agent. The man of the house is satisfied if his new home is convenient to the office and golf links and has adequate garage accommodations. He is finicky about a shower, good shaving mirror and light, a large tub, large drain pipe and ample storage space in the bathroom. Generally, he wants a quiet place that is warm in winter and cool in summer. Creature comforts are more important than beauty. But the modern woman, and she grows more modern each year, demands the last word in construction and equipment.

The list included here is as complete as space permits. It is based on the experience of realtors, builders and apartment dwellers in several states. The data have been checked against mail questionnaires and the writer's personal experience as the operator of hotels and a resident in apartments the past 12 years. It has been impossible to make allowances for certain sectional requirements due to climatic and other local conditions.

PLAN FEATURES

- Light, airy courts
- Adequate entrance lobby
- Rooms proportioned to class of apartment
- Rooms sized to take usual furniture
- Cross ventilation
- Minimum private halls
- Convenient communication between rooms
- Exposure of most used rooms
- Convenient door swings
- Unbroken wall spaces
- Large closets
- Adequate number of closets

CONSTRUCTION FEATURES

- Soundproof construction
- Fireproof construction
- Friction door hinges
- Servidors
- Ventilator doors
- Roll screens
- Rubbish chutes
- Safety locks above knobs
- Weather strips
- Large windows

PHYSICAL SURROUNDINGS

- Landscaped grounds
- Parking space
- Miniature golf course
- Putting greens
- Swimming pool
- Garden seats
- Playground, roof, safety features
- Flower gardens
- Fountains
- Tennis courts
- Wading pool
- Garden parasols
- Roof garden (seldom profitable as apartment house restaurant)
- Colorful awnings
- Chauffeur signals
- Porte cochere
- Mail boxes
- Window flower boxes

MECHANICAL FEATURES

- Concealed radiation
- Central cleaning system
- Incinerator

MECHANICAL FEATURES, *Cont'd*
- Silent mechanical refrigeration
- Self-leveling elevators
- Safety features on elevators
- Circulating ice water
- Water softener
- Rustless hot water lines
- Filtered drinking water
- Ventilated kitchens
- Ventilated corridors
- Automatic door checks
- Temperature control
- Noiseless, sootless heating
- Radio outlets
- Easily opened windows
- Surplus hot water

KITCHEN FEATURES
- High grade range, gas or electric
- Step-saving kitchens
- Colorful walls and trim
- Colorful floor
- Floor of cork, linoleum or rubber
- Automatic dishwasher
- Stainless sinks
- Mixing faucets
- Laundry tub in kitchen
- Built-in ironing board
- Built-in table
- Built-in can opener
- Built-in bottle opener
- Broom closet
- Numerous electric outlets
- Modern kitchen cabinet
- Dumbwaiter

BATHROOM FEATURES
- Color in tile and fixtures
- Safety shower mixer
- Heated baths (all year)
- Glass enclosed shower
- Enclosed tub bath
- Enclosed toilet
- Chair over toilet seat
- Tub and shower combination
- Colorful shower curtain
- Silently flushed toilets
- Floor material
- Mixing faucets
- Built-in bathroom scales
- Dental lavatory
- Double medicine cabinets
- De luxe mirrors
- Built-in bottle opener
- Hot water bag hooks
- Clothes hooks
- Convenient towel racks
- Recessed tissue holder
- Large tubs
- Large drain in bath
- Special shaving lights

BATHROOM FEATURES, *Cont'd*
- Built-in drawer space
- Several electric outlets
- Ventilated baths
- Chromium plated fixtures

ROOM EQUIPMENT
- Electric clocks
- Casement or double-hung windows
- Numerous base plugs
- Radiator enclosures
- Luminous door numerals
- Parquet floors
- Floors of cork, linoleum, rubber
- Drapery hardware
- Wall safe
- Full-length mirrors
- Phone connection in each room
- Wood-burning fireplace
- Fireplace, gas log
- Modern wall finishes
- Quality window shades
- Unbroken wall areas
- Arched doors
- Built-in book cases
- Modern facilities for hanging pictures
- Decorative lighting fixtures
- Luminous electric switches

CLOSET EQUIPMENT
- Cedar closet
- Built-in drawers
- Shoe racks
- Hat stands
- Built-in hangers
- Tie racks
- Cellarette closets
- Lighted closets
- Carpeted large closets
- Adjustable shelves
- Special door locks

SPECIAL FEATURES
- Well equipped house laundry
- Modern clothes drier in laundry
- Dry storage for trunks
- Baby carriage hall
- Ballroom or meeting room
- Food shop
- Valet shop
- Maids' rooms
- Provision for pets
- Garage
- Solarium
- Ample fire protection
- Public dining room
- Safety deposit boxes
- Delivery door in kitchen
- Telephone wall cabinets
- Mail chutes
- Centralized radio
- Awnings

SOUND INSULATION IN APARTMENTS

BY

ROGER W. SHERMAN

THE fact that noise has become a problem necessitating control indicates a fundamental and important change in the life of society. This change relates to the mushroom growth in complexities of existence. It is noticed in pressure and confusion. The stream of business and industrial life swirls daily into new nervous whirlpools; and the demand is growing that more compensatory measures for private life be developed to maintain an equable balance between the varied activities of living.

The isolation of sound is one such measure. Being largely psychological in its aspect, it has seemed less essential, heretofore, than the more obvious problems involving the organization of other planning factors. Excellent progress is being made toward criterions of structure and spatial efficiency. Problems of sanitation, light, ventilation and heat are being well met, and the solutions indicate a high degree of physical comfort. But the importance of questions involving mental and nervous reactions has not been, until recently, sufficiently recognized. Color, unity of arrangement, organization of time, conservation of human energy, the isolation of sound,—these all deal largely with the mental processes that influence physical action. They are questions, therefore, of great moment to the architect who is concerned with planning for private life. Upon him devolves the responsibility of organizing in terms of space and time physical entities in the production of a unity,—a unity which will, in turn, generate in its inhabitants a maximum of physical comfort and mental well being. The isolation of sound is recognized as a factor of increasing importance in this unity, and the solution of the problem it presents demands serious consideration.

FOUR PHASES

The apartment building as a unity peculiar to the present social structure is an established fact. Its purpose is the housing, for private family life, of an urban society. Within it, therefore, should be developed a maximum number of factors compensatory to the tension of public relations to achieve its proper function as a home, a place for physical comfort, nervous relaxation and mental pleasure. Sound isolation is a contribution to this function. Specifically, as a problem, it has four distinct phases:

1. The Psychological.
2. The Planning.
3. The Structural.
4. The Economic.

PSYCHOLOGICAL IMPORTANCE

This has been briefly indicated. Further investigation reveals that noise acts through the ear on the involuntary nervous system controlling the heart, the lungs and general metabolism. Tests under varied conditions show a lowering of efficiency in action and mental processes when noise is introduced, and a subsequent return to normal when the noise is removed. This seems to hold true in all cases, even when the noise has been tolerated for a sufficient time to be unnoticed as such. Sleep under noisy conditions has proved less generally recuperative than under conditions of quiet. It has been proved that quiet surroundings shorten the period of recovery from nervous strain. Rest is more profound, a tendency toward calmness and a lessening of mental distraction is noticed when noise is largely eliminated.

PLANNING

Insulation of apartment buildings against noises incidental to location may be accomplished in part by proper planning. Since walls act as an effective barrier to noise, the location of living spaces should be removed as much as possible from noise sources. The placing of service areas toward the street and the development of an interior garden court may accomplish this. Having many openings from the street to the court should be avoided. In large projects an arrangement of offset entrances to an indented court may serve as sound baffles. Air intakes should be located in quiet areas. Elevator shafts should be isolated from living quarters by corridors and stair wells. Bathrooms should be placed where sound is least likely to be heard, and plumbing lines should be located within the apartment that they serve and never within a wall separating two apartments.

STRUCTURAL INSULATION

I. Theory. Sound, a form of energy, is produced by vibration that travels in waves of varying velocities, depending on the medium. The denser the medium, the faster the sound will travel. Sound waves travel in solids, liquids and gases. "When waves in one medium encounter a second medium with a different elasticity or density, their regular progression is disturbed.

Part of the energy is thrown back in the form of reflected waves, part is absorbed in the second medium, and part is transmitted, the relative amounts depending on the differences in elasticity and density between the second medium and the first."[1] Sound waves may be transmitted in three ways: *First,* by passing through air spaces of a porous material, *Second,* by contact with a medium that in turn transmits a modified wave, and *Third,* by causing a minute vibration of a structure as a whole. Since sound is a form of energy, it cannot be destroyed. It must be transformed, and all solutions of sound isolation problems take this fact as a basis of procedure.

Laboratory experiments with materials of all types to determine their value as reflectors, absorbents and transmitters of sound disclosed three major facts:

1. Weight offers the greatest resistance to transmission.

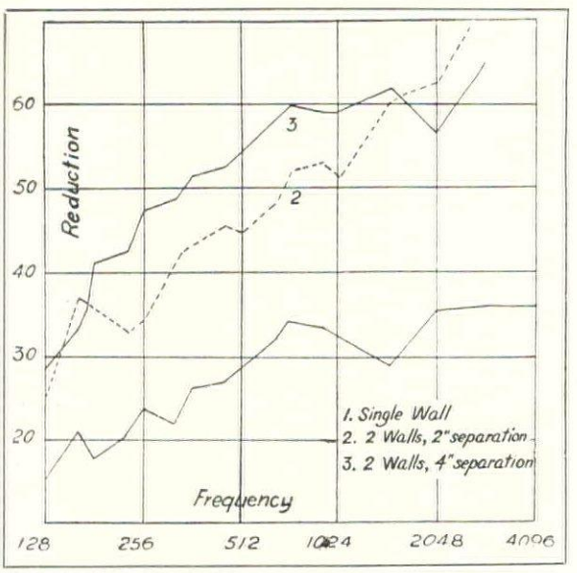
2. Porous materials absorb the most sound energy.

3. Hard, smooth-surfaced materials best reflect sound waves. These three statements relate generally to air-borne sounds. Various combinations of materials have been developed that, when used as walls and floors, reduce the transmission of such sounds between two rooms. Vibratory, or structure-borne sounds, are not as easily controlled. Watson states that: ". . . The theory of the subject is incomplete, and practical attempts to secure effective soundproofing are not always attended with success, even though the constructions used are in accord with the theory and apparently have the elements of adequate insulation. Sound progresses with facility through the different solid materials of a building in paths not easy to trace, and may be heard in positions quite remote from this source. This action, together with the extreme sensitivity of the ear, explains why the insulation of sound is a difficult matter."[2]

Sound is measured in "Sensation Units" (S.U.) or in "decibels" (dbs.). It has been demonstrated that the ear responds to the loudness of sound as the logarithm of the sound's physical intensity. (If one device, for example, produced 10,000 intensity units, it would require 100 devices to produce 1,000,000 units. Yet the ear would respond to the increased loudness only as the logarithms of those two quantities, 4 and 6, indicating the loudness of 100 devices to be only half again as great as one.) A sensation unit, or decibel, is the product of this logarithmic unit, or ear

[1] F. R. Watson,—"Acoustics of Buildings," 2nd Edition. Revised, pp. 4 and 5. John Wiley & Sons, New York, 1930.

[2] F. R. Watson,—"Soundproofing in Buildings," *Isolation,* Korfund Co., April, 1929.



P. E. Sabine

Fig. 1

scale, multiplied by ten. The range of sound measurement begins at the lowest point at which sound energy becomes audible,—the Threshold of Audibility; it ends at the upper level of maximum distinguishable intensity,—the Threshold of Feeling. Between them there is a scale of about 135 decibels. Ordinary conversation ranges between 35 and 65 dbs.

The penetration of a sound's intensity varies with the pitch. Sound vibrations cover a range of frequencies from about 16 to 21,000 per second, and the reduction factor of a given combination of materials in walls or floors will vary with even slight variations in pitch. (See Fig. 1.) In general, reduction is greater for high frequencies than for low. Since noise is composed of sounds of several frequencies, reduction values are usually given as the average of transmission tests in several frequency bands.

II. Practice. Sound control in apartments divides naturally into three groups:

1. Reduction of sound at its source.

2. Prevention of sound transmission through the structure.

3. Isolation of air-borne sounds from the area of audition.

Reduction of Sound at its Source. Since mechanical units generally produce noise, elevator machinery, blowers, fans, laundry machines, refrigerating and heating units should be selected for quietness as well as for efficiency of operation. Bathroom fixtures should be of the noiseless type. Sounds of running water may be lessened by the selection of pipes and connections adequate in size for the known velocity of water. Annunciator systems and door signals should be of the buzzer type. Checks on doors will prevent their

A Quiet and Restful Apartment Offsets the Effects of the Noise and Tension of Business Life. Buildings Facing Open Spaces Suffer Least from Reflected Street Noises

slamming, and care in the selection and installation of windows will reduce rattling and noises incidental to operation. Floors,—especially those of corridors and lobbies,—should be of a resilient material to prevent impact sounds.

Prevention of Sound Transmission Through the Structure. Several patented systems have been developed for insulating structure-borne sounds. As installed, they employ the principle of discontinuity of interior finish with the frame of the building by the use of absorbent sheathing and padded chairs or clips that support the interior finish and are designed to absorb and dissipate vibrations with the structure. Though many of them have been employed in the soundproofing of special rooms, radio broadcasting stations, schools of music, and for the correction of sound problems in completed buildings, their use in apartments has not become general. Fig. 2, 1 and 2 show partitions, and 5 and 6 floors that are typical of current practice. Several structural systems are in use for large projects. They combine some methods of sound insulation with the employment of pre-cast gypsum units for partitions, floors and ceilings. No reliable tests are available, but it is claimed that in addition to effecting considerable economies in construction they effectively reduce sound transmission. A common type of wall between two apartments consists of two tiers of 3-inch gypsum block separated by a 2-inch space in which are hung strips of felt, absorbent quilt, or a similar textured wall board. In some cases the space is filled with sawdust, rock cork, etc. Experience shows, however, that strips of any kind rarely add to the reduction value of the wall, and in the case of fill actually lessen it, as do ties or struts, by establishing a mechanical bond between the two walls. (See Fig. 1.) Furring strips on tile or gypsum block with the application of plaster over a fiber board base materially decrease transmission through single partitions and walls. Contact of walls with floors and ceilings should be prevented by the use of a cork or felt strip as indicated in Fig. 2, sections 1 and 2. Floating floors over the usual types of masonry and a furred ceiling plastered over fiber board reduce the transmission of impact sounds through floor constructions. Transmission of the noise of mechanical units may be lessened by setting machines on mats,—often made of alternate layers of cork, felt and lead, and sometimes supported on stiff spring clips,—which act as shock absorbers. Vents, pipes, soil lines, etc., should stand free of the structure wherever possible. Where they pass through floors and partitions they should be wrapped in felt, and hangers and braces should be applied over felt or porous rubber. Elevator shafts should be of very rigid construction, and the enclosing wall panels should be as nearly soundproof as possible.

Isolation of Air-Borne Sounds From the Area of Audition. Sounds within a room,—conversation, piano playing, radios, etc.,—may be reduced in intensity by the application, on ceilings or walls, of sound-absorbing materials. Cloth-

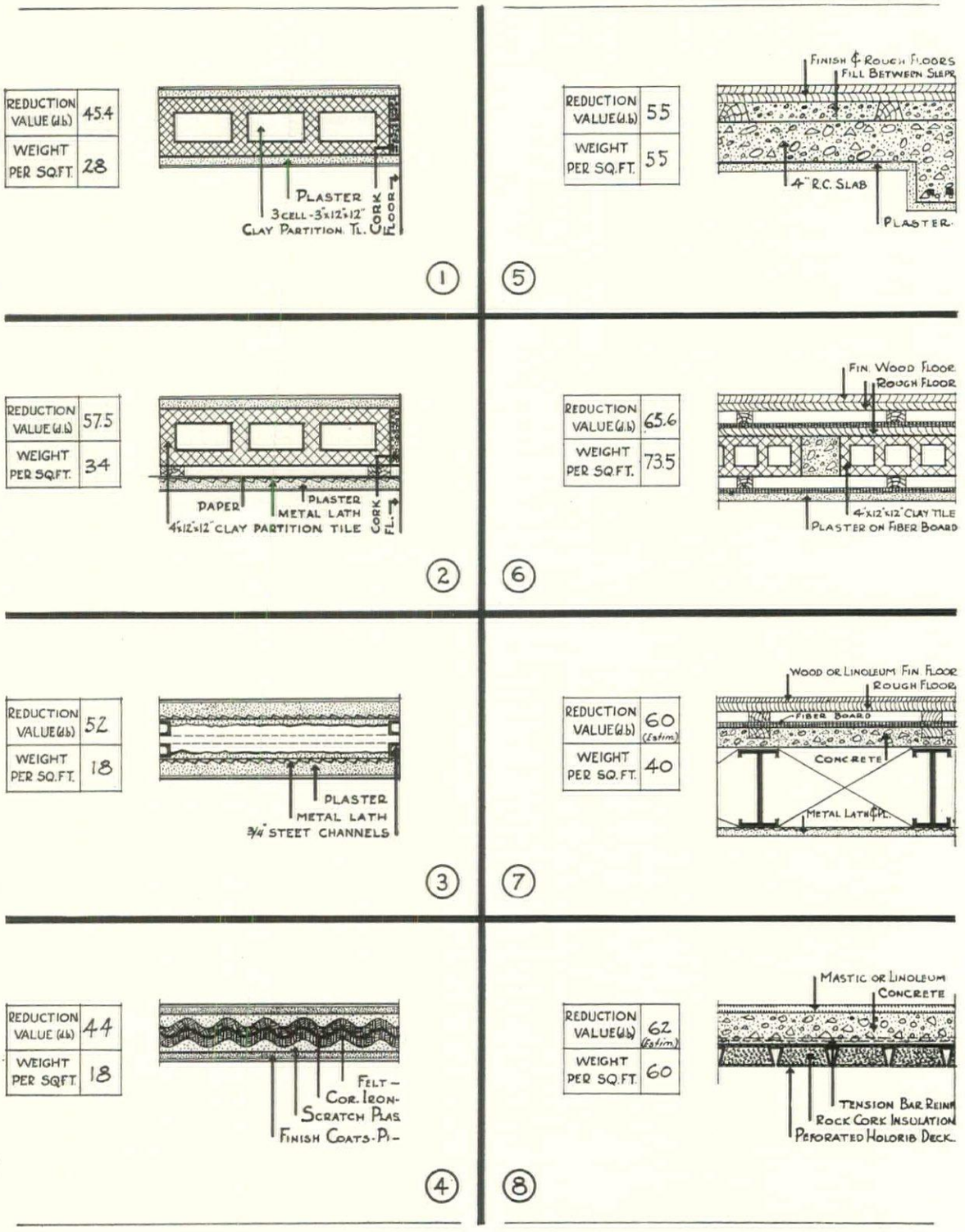


Fig. 2. Sections 1, 2, 5 and 6 Show Current Types of Wall and Floor Insulation. The Trend of Building Is to a Lighter, Less Cumbersome Structure. Sections 3, 4, 7 and 8 Show Possibilities of Combining Present Materials Toward This End

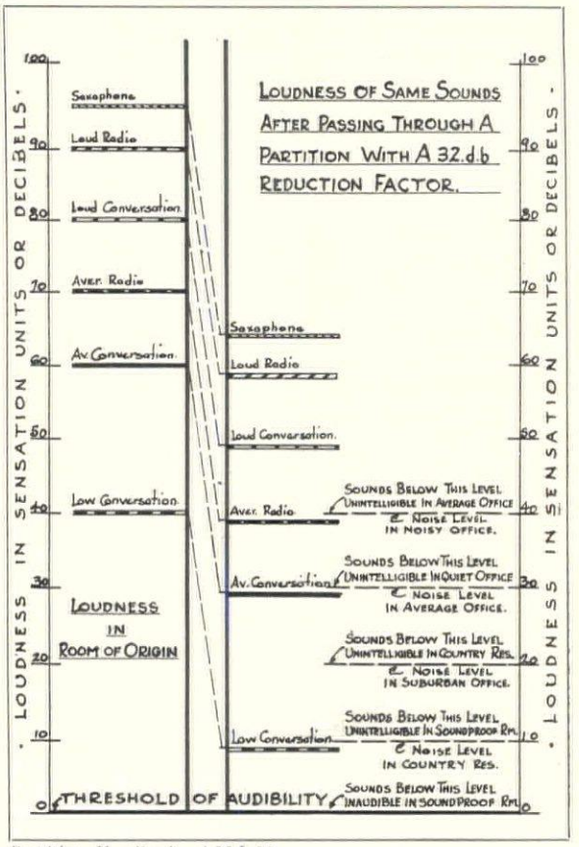
covered felt, rock wool covered with perforated metal, wall boards of cane or similar fiber, special acoustical plaster, loosely pressed composition tiles,—these are efficient in varying degrees. Rugs, draperies, furniture and people absorb considerable amounts of sound. Care should be exercised in the application of sound absorbents to prevent the creation of dead space without sufficient reverberation for aural comfort. Transmission of the noises may be reduced by using partitions and floors of the types mentioned. None can be especially recommended. Though many laboratory tests have been made, there exists a lack of practical data regarding reduction values for current types of construction. Field conditions vary greatly, and construction should be designed to produce the maximum efficiency for this and other factors involved. Doors of the usual type do not reduce sound greatly, and the consistent use of a sound-insulated type is important. To prevent travel of sound in ventilating systems, outlets from a single duct should alternate to individual apartments. Duct and fan connections should be of canvas. Air chamber or machinery noises from intakes may be reduced by using a series of baffles in the chamber or by the use of felt as an absorbent lining in the ducts.

The isolation of traffic noises constitutes a serious problem. All efforts to insulate for airborne sound may be nullified by intrusion of harsh street noises through open windows. Methods to exclude such noises are few. In some cases balconies may serve as sound barriers, and in some buildings a patented device has been installed on the exterior sills to accomplish the same purpose. In tests it shows a reduction of about 9 dbs. per window. Though this may prove adequate in some instances, the amount of ventilation obtained while still receiving the benefit of sound exclusion is limited. If the exclusion of outdoor noises is an important factor, windows should be stationary, and the mechanical ventilation of the building is indicated.

If the sound level of known conditions is established, it is possible to obtain another desired level by the use, as sound insulators, of construction units of known reduction values. These quotations, from the Bureau of Standards, are self-explanatory.

"Panels Whose Reduction Factors are Over 60 Sensation Units: Conversation carried on in an ordinary tone is reduced to inaudibility. If there is external noises in the listening room, a shout on the other side of the panel would be practically unnoticeable.

"Panels Whose Reduction Factors Lie Between 50 and 60 Sensation Units: Conversation in ordinary tones heard through the panel is barely audible, but unintelligible.



Partition Handbook, A.M.L.M.

Fig. 3

"Panels Whose Reduction Factors Lie Between 40 and 50 Sensation Units: Conversation in ordinary tones heard through the panel is quite audible, but difficult to understand. If the voice is raised, it becomes intelligible.

"Panels Whose Reduction Factors are Less Than 40 Sensation Units: Conversation in ordinary tones heard through the panel is distinctly audible and intelligible.

"The above comparisons are based on tests in a listening room in which there was no noise and which was quite reverberant. In a room furnished with rugs, draperies, or other sound-absorbing objects, the panels would be apparently more effective than when tested in bare rooms.

"Attention must be called to the masking effect of external noise. If a panel having a reduction factor between 30 and 40 sensation units is taken as an example, the following facts may be noticed. If there is no external noise and the panel acts as the wall between two rooms which are fairly reverberant, it is quite easy for two people who are on opposite sides of the panel to carry on a conversation, but if there is the slightest noise in the room where the person is listening, the conversation becomes a mumble, and the chances are that not a single word will be understood. The louder the noise the greater the masking effect.

From the above it is readily seen that a panel might give entirely satisfactory results under some conditions while under other conditions it would be entirely unsatisfactory. In other words, the conditions under which a structure is to be used are to be considered, as a given structure may seem satisfactory or unsatisfactory as these conditions are favorable or unfavorable." *

ECONOMIC VALUE

The complete use of sound insulation systems in apartment buildings has been limited, due to (1) complex installation, sometimes causing confusion in the field, (2) the fact that they occupy an appreciable amount of space, thereby cutting down rentable area to some degree, (3) additional cost implied by the foregoing, and (4) the unwillingness of owners to install such systems unless forced to do so by public demand or by unsatisfactory sound conditions in a completed building. Walls between apartments, elevator shaft enclosures and bathroom partitions are usually insulated to some degree, depending upon the location, the type and the cost of the building. Regarding such questions as possible increase in rents, prevention of early obsolescence, and the development of a preferred location resulting from the use of sound insulation, no reliable data are obtainable. Surveys should be made for every project to determine the relative importance of these points with others involved.

It is believed that public demands for adequate sound insulation in apartments will shortly become insistent. In New York City, the Noise Abatement Commission has made an extensive survey of the causes and prevention of street noises and is advocating legislative control of noise where possible. A committee of the American Society of Mechanical Engineers is investigating the causes of machinery noises and is endeavoring to fix a standard of sound by which machines can be graded. Both efforts are fundamentally economic, and indicate the importance of the subject from this standpoint. Quietness usually tends to increase values in a given locality, and programs or methods to promote it have a certain economic worth. A statement of this necessitates a close relation with other influences, and any other procedure is mere guesswork.

SUMMARY

I. Sound insulation in apartments constitutes a complex problem. Economic and structural questions vary in every case and require study. If sound insulation is to be procured, methods must include three parts:

1. Reduction of noise at its source.
2. Prevention of sound transmission through the structure.
3. Isolation of air-borne sounds from the area of audition.

Construction that provides for two of these parts may prove ineffective if the third is neglected. In many cases a standard method may prove unsatisfactory, and difficulty may be encountered under any or all headings. In such cases a searching technical analysis, an unbiased use of methods and materials and extremely close field supervision offer the only means of obtaining satisfactory results.

II. Future development of materials may do much toward the securing of quiet apartment buildings. A deep inquiry into sound insulation problems discloses close association with several others. If the subject of sound insulation in apartments becomes of vital economic importance, subsequent construction methods will greatly influence current practice in heating, ventilating, sanitation and structural design, with a possible departure from present plan requirements and a consequent radical change in exterior expression.

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*Chrisler, V. L. and W. F. Snyder,—"Transmission of Sound Through Wall and Floor Structures." Research Paper No. 48, pp. 548 and 549, Bureau of Standards, Washington, 1929.

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THE RESIDENTIAL DISTRICT GARAGE

BY

A. T. NORTH

PRACTICALLY all zoning regulations and building ordinances outlaw the parking garage from urban residential districts. There is, however, an actual necessity for having parking garages in multiple-dwelling residential districts to contribute to the convenience and comfort of their inhabitants. Parking garage accommodations also enhance the rentability of multiple-dwelling buildings, provided they are unobjectionable in appearance and operation.

There must have been valid reasons, sustained by popular approval, for declaring parking garages a nuisance occupancy in residential districts. The ordinary commercial parking garage building was cheaply constructed and architecturally unattractive. These undesirable features are often further added to by the noisy operation of the garage, conducted by ill-kempt operatives. To these undesirable features there may be added unsightly gasolene pumps and the characteristic over-illumination at night.

Architects and garage engineers are today designing parking garages that are acceptable in residential districts and that are distinctly fine architectural contributions to their neighborhoods. These buildings, with high class management and operation, have definitely removed the parking garage from the nuisance occupancy class. In some cases there were objections to their construction, resulting in litigation. The courts evidently held that with proper design and operation, sufficient safeguards were provided for the protection of the surrounding property. The number of adequately designed parking garages is limited, but they are widely distributed geographically, which indicates the universal necessity for this class of buildings. Different solutions of the problem have been made, tributes to the ability of the architects.

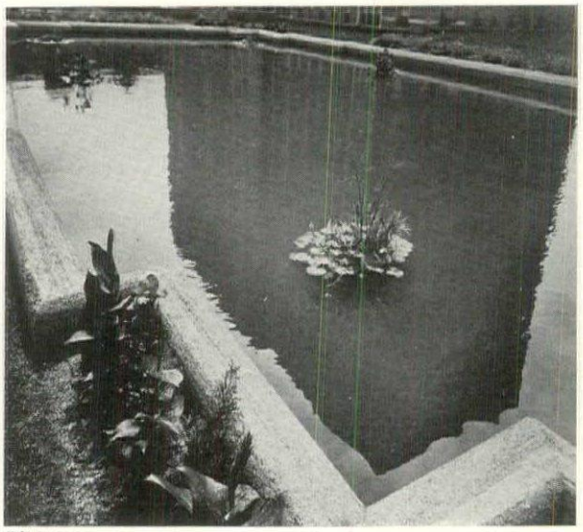
Rittase

Lawn on Garage Roof, Garden Court Apartments.
Ralph B. Bencker, Architect

A notable example of the parking garage in close proximity to high class apartment buildings is that of the Garden Court Apartments occupying the city block bounded by 47th, 48th, Pine and Spruce Streets, Philadelphia, Ralph B. Bencker, architect. The project consists of seven apartment buildings facing the different streets. The central

Rittase

Entrance to
Garden Court Garage

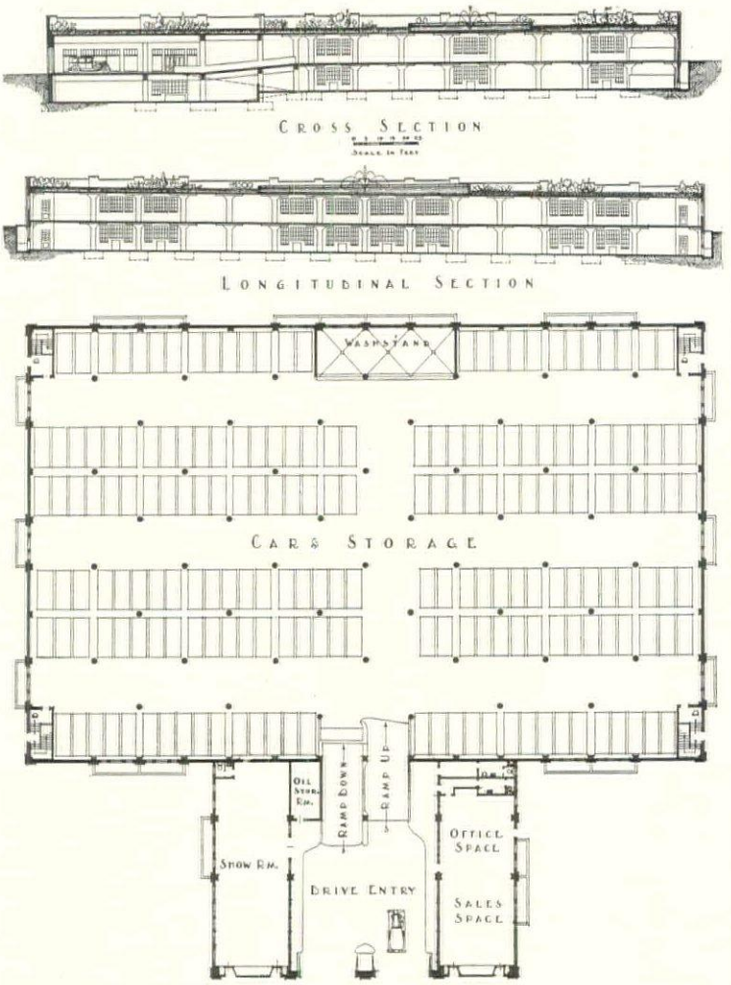


Rittase

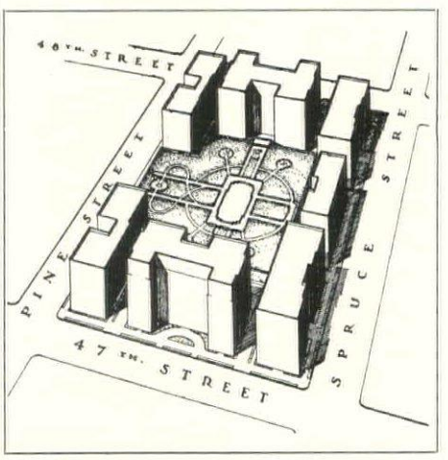
Lily Pond on Garage Roof

portion of the block is occupied by a one-story and basement garage building. The entrance to the garage, on Pine Street, is flanked by a one-story store room on each side. The roof of the garage, one story above ground, is pitched to drains and finished with a membrane waterproofing covered with asphalt. A concrete curb about 2 feet, 6 inches high forms a lily pond which also contains a small fountain. Eighteen inches of soil is placed on top of the roof, which is planted for turf and flower beds. The roof of this garage forms the garden court and presents a pleasing aspect to the surrounding apartments. Exhaust fans remove the engine fumes through vent ducts in the adjoining buildings. In this instance the garage is secluded from the adjoining buildings and streets, except for its entrance and exit, and the garden is an attraction added to that of the convenience of the garage.

The problem of the parking garage adjacent to apartment buildings was solved in a different manner in the Homewood Garage, Baltimore, Palmer, Willis & Lamdin, architects. This garage building is placed on one side of a city block and is a detached structure. The remaining portion of the block is occupied by apartment buildings. It is an exclusive neighborhood, adjoining the new site of Johns Hopkins University. Entrance

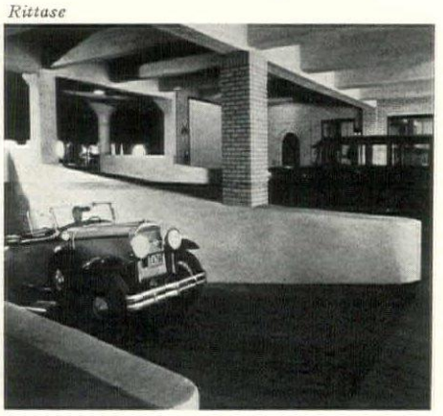


Garden Court Garage



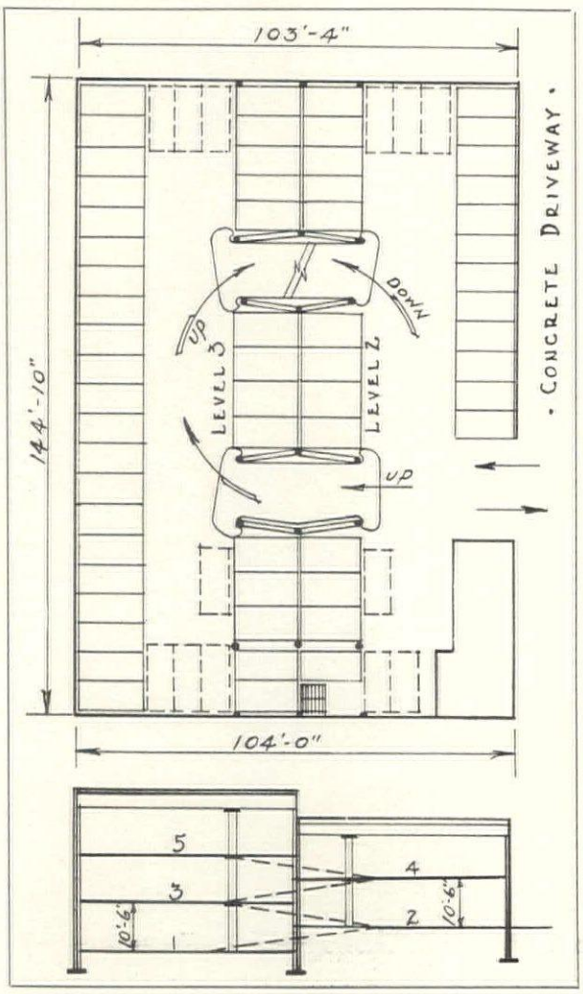
Garden Court Garage. Above, Block Plan Perspective; Below, Interior of Garage

Rittase

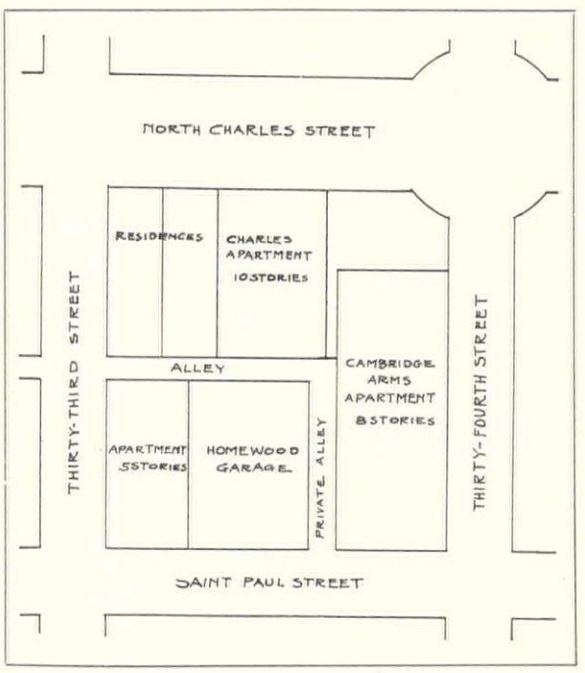


Leopold

Homewood Garage, Palmer, Willis & Lamdin, Architects. Garage Building in Center, Surrounded by Apartment Houses



Homewood Garage, Plan and Section



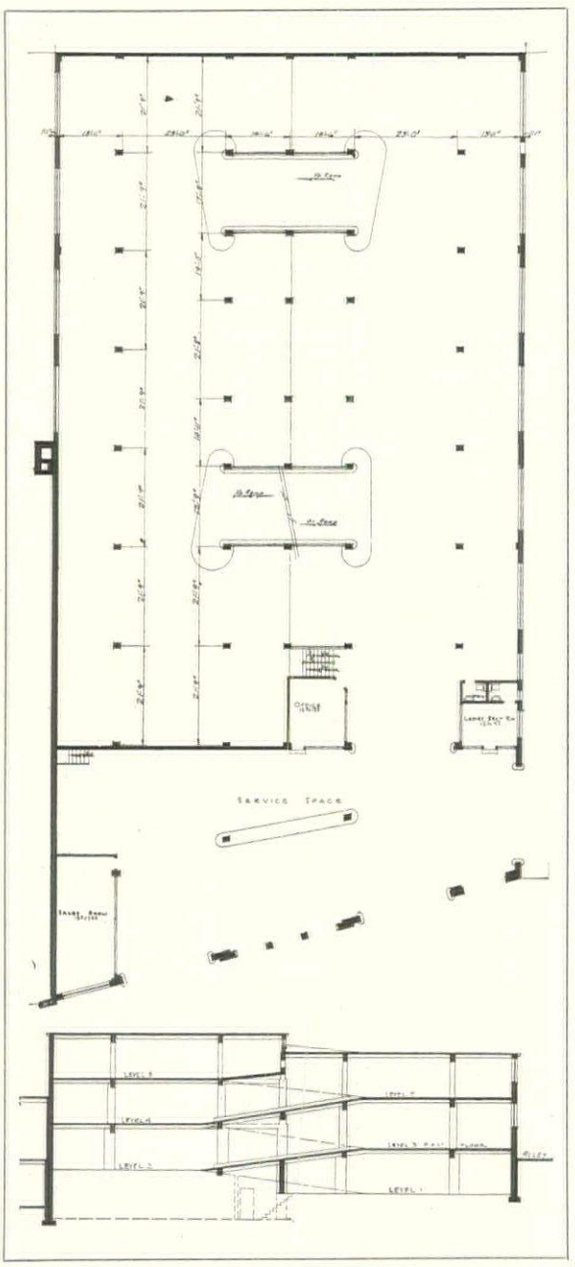
Homewood Garage, Block Plan

to the garage is in one side of the building from a wide concrete driveway leading to the street. The street elevation is severely plain, having a series of finely proportioned arched recesses in the wall. An entrance for pedestrians is placed in the center of this elevation. The whole conception has been designed and constructed in a dignified, simple manner, appropriate to the neighborhood.

In restricted residential districts provision is made usually for a small business center conveniently located, in which there is a parking garage. The Ward Parkway Development, Kansas City, has such a garage, designed by E. W. Tanner, architect. Two entrances on the front and one on the side provide access to the building. In the front portion are located the gasolene pumps and service station. There are no signs, oil pumps, or other garage features to indicate the specific use of this attractive commercial structure.

Ward Parkway Garage,
E. W. Tanner, Architect

Tyner & Murphy

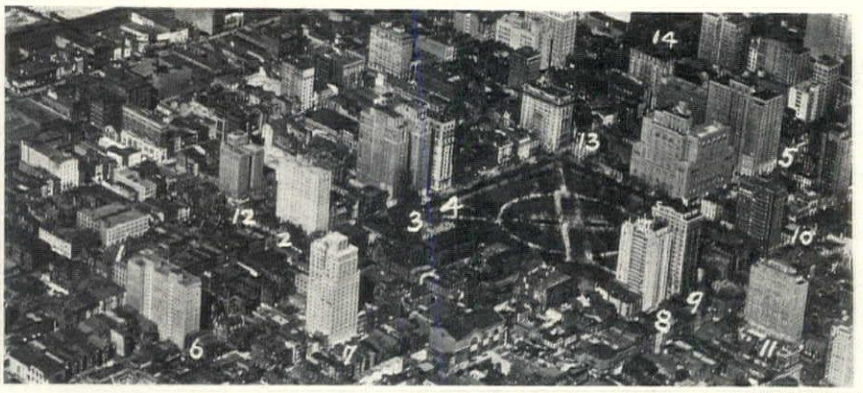


Ward Parkway Garage, Plan and Section

Large apartment buildings are being constructed in old, exclusive residential districts made up of one-family city dwellings, such as the Rittenhouse Square section of Philadelphia. As the parking garage is a necessary adjunct to the high class multiple-dwelling house, the Rittenhouse Square section is served by the Plaza Garage, formerly the Aldine, located on Sansom Street, the Ballinger Company, architects. This building is of the ramp type, with two stairways and a passenger elevator; garage office, waiting rooms and toilets on the first floor, and chauffeurs' room on the roof.

The parking garage has been incorporated successfully in high class apartment buildings. The advantage of this arrangement is that a direct and convenient connection, by elevator, is provided between the apartments and the garage. The type of construction used is such that the garage por-

Plaza Garage, The Ballinger Company, Architects



Rittenhouse Square
1. Plaza Garage
2. Chatham Hotel
3. Rittenhouse Plaza
4. Wellington
5. Warwick
6. Embassy
7. 2031 Locust Street
8. 1900 Rittenhouse
9. 1830 Rittenhouse
10. 18th and Rittenhouse
11. 19th and Spruce Streets
12. Warburton House
13. 18th and Walnut Streets
14. Latham

Dallin Aerial

tion is effectively insulated from the rest of the building for noise, fire and fumes. Of this type, reference is made to the Continental Apartments, Arsenal Square, Cambridge, Charles R. Greco, architect. About 40 per cent of the ground area, a rear court, is occupied by a garage in the basement and sub-basement, each with direct access to the street. The Longwood Towers Apartments, Brookline, Mass., Harold Field Kellogg, architect, and the Park Mansions Apartments, Schenley Park, Pittsburgh, T. R. Hinckley, architect, are important examples of the inclusion of the garage in the apartment building.

The residential district parking garage is operated exclusively on the 24-hour monthly contract system, having little transient business. Experienced observers are of the opinion that it operates on as profitable a basis, by and large, as the business-section commercial garage. The land investment is comparatively small. The established confidence in the operator results in additional revenues, frequently amounting to more than 60 per cent of the total receipts, from the sale of accessories, gasolene, oil, washing, lubricating and other services.

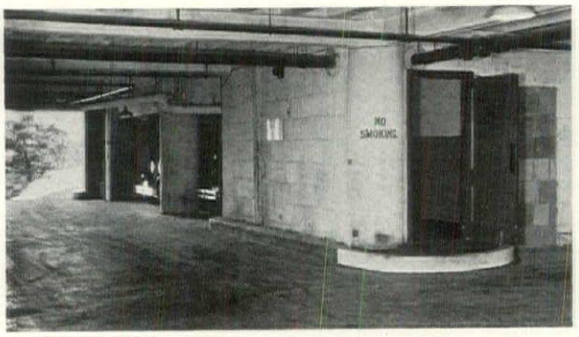
It is necessary and proper to define legally the permissible locations of garage and other business occupancies by zoning laws. It is demonstrated that in high class multiple-dwelling residential districts, the parking garage is a social and economic necessity. It follows, then, that some legal method must be found to permit their construction that will insure the conservation of property values and the peace and comfort of the people. In formulating a method of legalizing their construction it must be remembered that a prohibition under ordinary conditions always enhances the value of its violation. Under some existing methods of legalizing violations of building ordinances and zoning laws, these valuable privileges have become a matter of barter and trade because of improperly constituted authority. The dismissal of injunctions has proved to be a successful method under existing laws, entailing the loss of valuable time and undue monetary expense to which no one should be subjected. Possibly a solution of the problem of these zoning laws or building ordinance violations would be to establish certain legal requirements as to architectural design, mechanical equipment, sound insulation, fumes disposal, fire protection and character of operation, and the adjudication of the zoning law violations to be made by an established method of arbitration between all of the parties interested.

Willoughby

Continental Apartments, Charles R. Greco, Architect. Entrances to Garage at Left, Ramps Up to Basement and Down to Sub-Basement Levels. Garage Under Interior Court

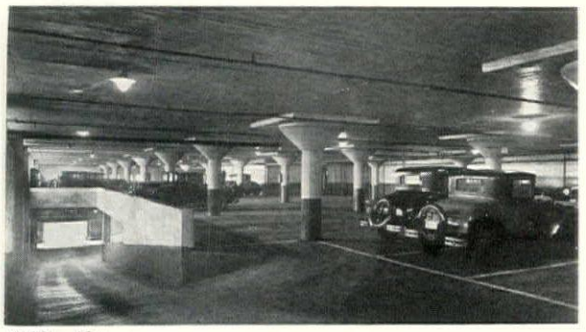
Willoughby

Garage Incorporated in the Apartment Building, Longwood Towers, Brookline, Mass. Harold Field Kellogg, Architect



Hess

Interior Park Mansions Garage

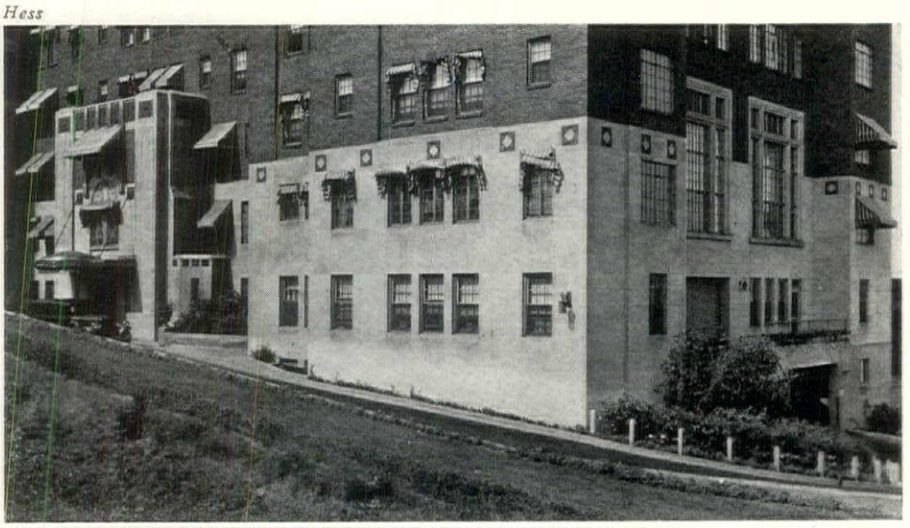


Willoughby

Longwood Towers Garage Interior

Elevators Direct From Apartments Have Small Lobbies in the Garage

Hess



Entrance to Apartments Upper Left, Entrance to Garage Lower Right. Park Mansions, Pittsburg. T. R. Hinckley, Architect

SELECTING APARTMENT ELEVATORS

BY

W. T. WHITE *

PARALLELING the growth of the apartment building has come the development of the "Tenant-Operated" elevator. First we saw the familiar standard straight push button type which still finds its place in the scheme of things in spite of the fact that it is essentially a "one-man" car, or as someone has said, it is "one for all and all for one," one after another. Second was developed the modern Two-Button Multicall type, today's great forward step, in which almost all the advantages of an operator-controlled car may be available to the public, providing both power-operated car and hatch doors are installed. Then came three modifications of this control: First, the Single-Button Multicall, developed to give to the small apartment house many of the advantages of the Two-Button type at about the price of the straight Push Button type; another, the Two-Car, Two-Button Multicall Control which extends the advantages of this type to a bank of two elevators controlled from a single riser of corridor push buttons; and finally, the Personal Service feature designed for apartments of the highest class where an attendant is provided to watch over and assist the passengers. For the skyscraper apartment hotels and coöperative apartment buildings the standard operator-controlled cars which have been developed for the modern office building, are available, and arranged for either car switch operation with level landing or for Full Automatic Control.

Fortunately the intense activity in the building and development of apartments has failed to curb individual expression. The present-day apartment house or apartment hotel has grown to be "home" for many of us. There seems to be just about as much variation in apartment houses as there is in private homes, and so it is with the elevator requirements. The type of elevator service rendered must make its appeal to the tenant through his home life, which is distinct and different from his business activities. Does he come from a former home where he has been accustomed to have servants to wait upon him? Then in general the "Tenant-Operated" elevator is not for him, unless it be equipped with the "Personal Service" feature. Is the building speculative in character? Then the equipment may have to be selected almost entirely on a price basis, but here sufficient consideration must also always be given to sound engineering principles. In other cases the owner may wish to make his building outstanding in character, but he must not be unduly influenced by the spectacular without due regard for fundamentals.

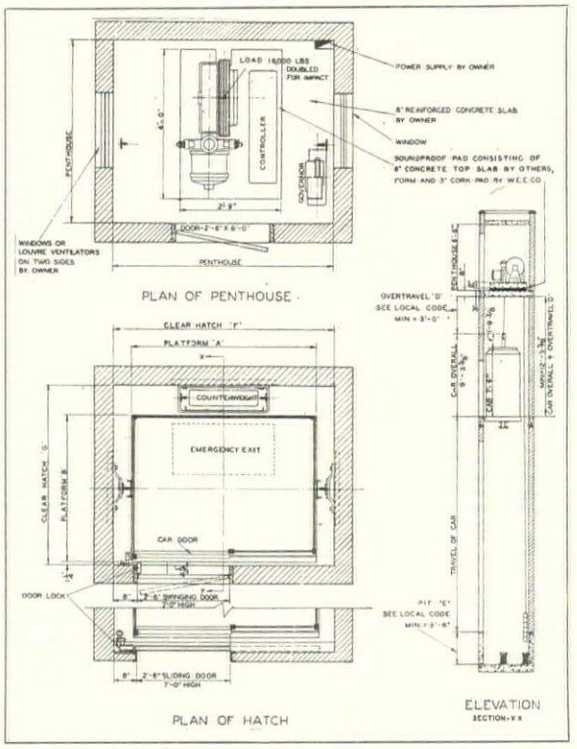
*General Engineer, Westinghouse Electric Elevator Co.

FUNDAMENTALS. What are these sound engineering principles, these so-called fundamentals? Let us list the major characteristics of an apartment house elevator in the approximate order of their importance.

They are: (1) Safety, (2) Reliability, (a) Accessibility, (b) Ventilation, (3) Quietness of Operation, (4) Appearance, (5) Type of Service Rendered, (a) Convenience, (b) Control, (c) Traffic Handled, (6) Standardization, (a) Costs.

1. SAFETY. Safety is of the utmost importance in apartment houses, because it affects the passenger at home where it involves the safety of the family, children as well as adults. Standards of practice which would be relatively safe for adults would be unsafe in elevators used frequently by children and old persons. Particular attention should be paid to safety where the elevators are "Tenant-Operated" and no operators are in attendance. Some of the factors which determine the safety of an elevator are not always appreciated. For example, in some cases in order to match up with the rest of the corridor trim, the swinging elevator hatch doors have been so mounted that the distance from the car platform door to the corridor door has become large enough to permit a child to step onto the threshold and then allow both doors to close. Under such conditions, a "Tenant-Operated" elevator might easily move away to answer another call, with possible disastrous results.

It is natural and well within the realms of possibility for an elevator to stop between floors, due to setting of the safety, or to pass the top or bottom floors due to overload or control failure. Provision should be made so that a hoistway door may be opened from the outside by an attendant to allow the removal of passengers. The elevator should be equipped with a call bell so that passengers may send for assistance. Hoistway doors may be either of the sliding or swinging type and should be self-closing. For "Tenant-Operated" cars the car gate or door should also be equipped with a reliable closing device. The present trend



Penthouse and Hatch Layout for the Standardized Apartment House Elevator

is toward a power-operated car door. Solid doors should be used when power-operated, since fingers may be hurt if caught in a scissor-type power-operated gate.

2. RELIABILITY. Reliability of operation is of great importance in an apartment house because the service is frequently dependent upon a single elevator. In the hall type of apartments, two elevators may be grouped together to give service to a number of apartments on the same floor. The design of many apartment houses, however, is such that only one or two apartments can be served from a single elevator. This arrangement is often desired because of the privacy obtained. It has a disadvantage, however, in that the service is dependent upon a single car, and a shutdown would render this group of apartments without service. In some cases where service elevators are installed, they are so arranged that entrance to the apartment is obtained only through a kitchen or butler's pantry. In one particular apartment house, the passenger elevator in the front and the service elevator in the rear were purposely made to open upon a communicating hall. It was the practice of this building when a shutdown occurred in a passenger elevator, to lay a carpet on the floor of the service elevator which had purposely been equipped with a rather good cab, and use this elevator as a passenger elevator. Guests could then be escorted to this elevator and from the elevator to the front door of the apartment which they were visiting.

Another factor which greatly increases the reliability of service is to have all machinery in an accessible place. A secondary sheave or governor located beneath the main penthouse floor and in such a small space that it is very difficult to get at, is apt to be neglected. Ventilation is of great importance, and this, too, is frequently neglected. The insulation of electrical machinery will stand certain working temperatures for a long period of time. If this temperature is exceeded, deterioration may in some cases be very rapid. It frequently happens that machine rooms which are poorly ventilated are for the same reason very inaccessible. Repairs are not only expensive and difficult to make, but delay may be involved which will be detrimental to service, particularly where the whole building is dependent upon a single elevator.

3. QUIETNESS OF OPERATION. It is common knowledge that machinery for apartment house work should be particularly quiet in operation.

4. APPEARANCE. The appearance of the elevator, such as the cab, accessories and entrances are of as great importance as smoothness of operation, elevator speed and capacity. The tenant frequently knows nothing about the elevator at all except that it has a beautiful cab and other appointments, which, of course, should

Class No.	Type of Bldg.	No. of Floors	Type of Equip't.	Speed FPM	Capacity of Car	Control	Door Equip't.	
							Hatch	Car
1	Apt. House	Up to 6	Geared Rhe. Single Spd.	125	1500-1750 Lbs.	S. Button Multicall	Hand Closer	Power Operated
2	Apt. House or Apt. Hotel	5 to 8 8 to 15	Geared VV Geared VV	300 400	1500-2000 Lbs. 1500-200 Lbs.	*2-Button Multicall CS VV * Dual	Power Operated "	Power Operated "
3	Apt. Hotel or Coop. Apt	15 to 20 Over 20	Gearless VV Gearless VV	500 600	2000-2500 Lbs. 2000-2500 Lbs.	* CS VV Dual Full Auto. (signal)	Power Operated "	Power Operated "

* Or Two Button Multicall with Personal Service.

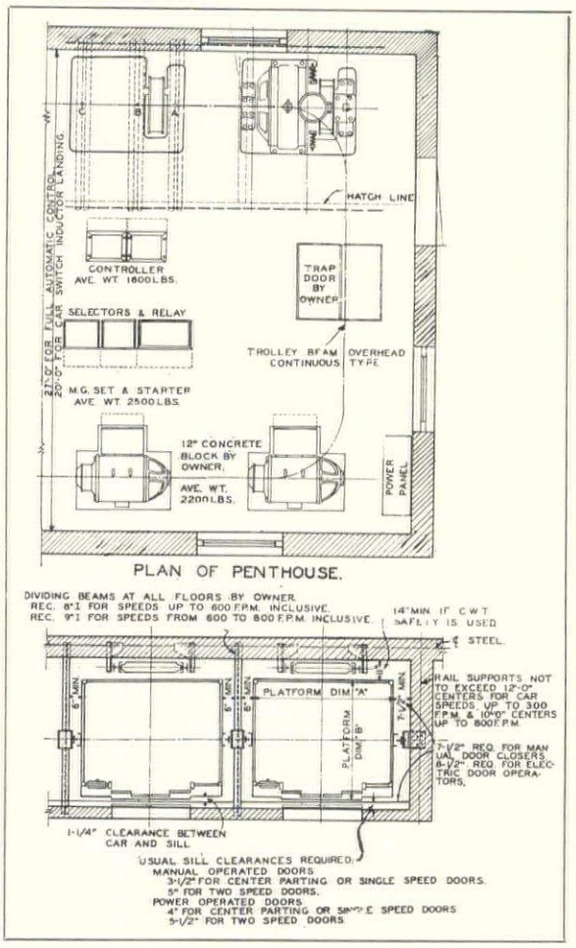
be in harmony with the building decorations. Proper attention to these details will enable the elevator equipment to attract tenants by first impressions and hold them afterwards by performance.

5. TYPE OF SERVICE RENDERED. The service rendered should be consistent with the type of building and conform to the building standards. The service outlined is recommended.

The elevator must be convenient to use if it is to be of the "Tenant-Operated" type. For this reason power-operated doors are recommended in the given outline wherever the cost is in keeping with the character of the building. The development of the Personal Service feature has been brought about largely through the desire of the owner or manager to make the elevator service as comfortable and convenient as possible for his tenants. The types of control, as listed here, are in general to be recommended, but variations are oftentimes acceptable. Any elevator manufacturer would welcome the opportunity to investigate and make unbiased recommendations.

THE TRAFFIC PROBLEM in apartment houses is seldom one in which the number of passengers to be handled has a great deal of bearing upon the equipment to be used. The problem is frequently one of psychology rather than traffic, and the service to be rendered is more one of personal service to the individual than it is of general service to the building. The lack of appreciation of this fundamental principle has been the cause of many misapplications. The speeds of elevators, for example, are determined not only by the time required to carry a passenger from an apartment to the street, but also upon the effect of this speed on women, children and elderly persons.

It is assumed that there will always be at least a service elevator available in case it is necessary to shut down a passenger car for any cause. The desirability of incorporating in the building plans such arrangements as to make the use of this service car convenient and comfortable for the tenants has been touched upon under Reliability. Where more than one elevator is provided, it is desirable that they be placed in adjacent hatches wherever possible. Of course, such an arrangement is out of the question with certain types of buildings where each section or wing may be provided with its individual elevator. In such case the availability of the corresponding service car must be carefully studied. The actual number of passenger cars required to give adequate service in the many varying types of apartment buildings, apartment hotels and coöperative apartments should be given the most careful attention. The leading manufacturers maintain engineering staffs, available to the owner or architect. When consulted, they should be given all of the essential data, including the location and type of the building, the kind of competition, the type and habits of the tenants if possible, the number and sizes of the apartments and the approximate number of tenants, plans of the first or lobby floors and the various typical floors, with an elevation giving floor heights.



Typical Passenger Elevator Layout. Plans of Penthouse and Hatch

6. STANDARDIZATION. There is a definite economic need for a high quality elevator designed and built especially for the service indicated under Class 1. Apartment houses of this type have yielded to mass production methods. Thus it follows that the elevator equipment must necessarily be cheaper than other types, and first cost and maintenance must be kept lower. To obtain for a lower cost and smaller maintenance charges an elevator which is safe for women and children to operate, reliable, quiet, smooth in running and with small space requirements, it is necessary that equipment be selected that has been specially designed for such service and which is the result of considerable study and experience on the part of the manufacturer.

POLICY AND OPINION

UGLY BRIDGES

BRIDGES appear to be receiving general attention, as was indicated by an editorial in the New York *World,* August 25, 1930, which makes specific reference to the new Poughkeepsie Bridge. This editorial contains two statements to which exception may be taken as being unsound and dangerous to the promotion of æsthetic bridge design. One statement: "Yet with regard to the appearance of bridges, we have often wondered whether it is possible to build an ugly one." Ugliness, of course, is susceptible to definition as applied to bridges. By and large, it is evident that bridges of all kinds as disposed throughout this country are unparalleled examples of ugliness. Efficient? Yes, the American engineer gets the maximum work from every ton of structural material used,—that is economical designing, of which we are proud,—but beauty has not been a consideration. The wonder is, rather, that it is possible for us to build a beautiful bridge.

Again: "All bridges are beautiful because of the nobility of their function, something that transcends even the worst blunders of design." Nobility of function does not necessarily establish beauty of structure. A battered box car or a dilapidated gondola car transports food to the starving or coal to the freezing,—both noble functions of charity and mercy,—but are these cars structurally beautiful? The principle involved, in bridges or even chairs, is applicable to the innumerable structural forms that properly, adequately and economically serve their purpose, but from these a *selection* must be made that is good looking. Man's handiwork, *per se,* has no inherent beauty. Beauty is the resultant of certain qualities introduced intentionally.

American bridge engineers have failed pitiably to incorporate beauty in bridges. The few bridges that do possess that quality serve but to accentuate this failure. Engineers collaborate frequently with architects in European countries, and the good results are readily apparent in a study of European bridges. Collaboration between engineers and architects is rare in this country. In some cases it has improved decidedly the æsthetic design of bridges. It is a question as yet as to just what our architects can contribute to the betterment of bridge design. Their failures appear to be a lack of understanding of the function of the parts of the bridge and a failure to dissociate their conception of a building with its stylistic accessories. There is, however, a growing appreciation of the problem of the æsthetics of bridge design among architects and engineers that must lead to the betterment of American bridges. A. T. N.

PLANS AND RENTS

A CRITICAL study of the American apartment building as a type discloses two obvious characteristics,—plan and architectural design. The apartment building is a distinct type that has been developed apparently to satisfy the ideas and demands of the tenant occupants. Rentability and earning capacity are the principal factors that influence the design. Thus the economic interests of ownership rather than appropriate architectural design are the causes of the apartment building's present status. These justly may be the premier considerations, but it *is* entirely possible to associate financial success with the finest quality of architectural designing in every kind of income-earning building.

Rentability depends chiefly on two factors,—location and plan. Every tenant desires the most comfortable and convenient quarters purchasable by his rent-paying ability. Competition for tenants has resulted in the development of plan arrangements and mechanical equipment that best satisfy these two desires. As a result, the plan of the American apartment as a type is probably the most comfortable and convenient of any. Competition has compelled also the development of the most economical,—not always the best,—kind of construction. Plan and construction, then, have been classified and standardized, in a measure, into the several grades or classes of apartments in keeping with the procurable rentals. Recognizing the social and economic necessities for the several grades or classes of plan and equipment, it is acknowledged that the apartment house plan has been developed to a high state of perfection. The standardizing of plans has made it possible to produce them at a surprisingly low cost.

In these studies, it is found that the characteristics of plan and construction vary in the different sections of the country, indicating the influence of local conditions as to materials, methods of construction, building laws, social customs and methods of financing.

SMALL KITCHENS FOR APARTMENTS

BY

ROGER W. SHERMAN

REDUCED to its simplest terms, a kitchen exists as (1) a place in which to prepare food, and (2) as a place where dishes are washed and put away. In addition, it provides storage for food, utensils and cleaning articles. Apartments are tenanted by people with interests other than a personal and meticulous upkeep of a complicated establishment, and the arrangement of equipment to serve the purpose of a kitchen with the minimum of time and effort is of great practical value.

GENERAL FACTORS INFLUENCING DESIGN

1. SIZE, SHAPE AND LOCATION in relation to living quarters, corridors, ventilation, daylight, heat and water supply. These will be determined by the factors of location, cost, size of units, rental scale or selling prices, and percentage of equity return governing the choice of building types.

2. EFFICIENCY OF EQUIPMENT ARRANGEMENT. Experiments in home laboratory kitchens* have established the value of a scientifically compact area where all equipment is available with a minimum of motion and effort. Location of work counters, food, utensils, sink and stove should be governed by this principle. Sinks should have drains or counters on both sides where possible; if not, the drain should be at the *left* of the sink. Cabinet and refrigerator doors should swing in a direction to expose interiors most naturally from the center of the working area.

3. COMFORT OF OPERATION. A minimum working space of about 30 inches between fixtures is necessary for kitchen work without strain. Cabinets above a height of 7 feet are of little value where space does not permit the use of a small portable step-ladder. Ideally, the heights of counters, sinks and stoves should be adjustable, but a counter height from the floor of 34½ inches should be specified as suitable for the average person. Catches on cabinets should be positive, but easy to operate, such as the bullet type; and drawers should be of metal to prevent sticking. Confusion in unit door swings and inaccessible corner cupboard space should be avoided. Floors should be quiet, durable and resilient, such as linoleum, cork or similar compositions. Light should be evenly diffused, and fixtures should be placed so as to avoid shadows within the work area. Wall plugs above counters permit the use of various kitchen appliances and should be specified and their location shown on plans.

4. MAINTENANCE. Equipment should be selected for convenience, minimum of upkeep, and possible salvage value. Cabinets and shelving should be units of standard approved manufacture, avail-

*Spatial efficiency and labor saving methods are being intensively studied by housing engineers throughout the country. Results of scientific experiments with kitchens by experts of the Good Housekeeping Institute and the Herald Tribune Institute constitute the authority for many of the statements contained in this paper.

The Small Kitchen Should Conserve Space, Time and Human Energy. Arrangement Shown Is Wasteful of All Three. Locations of Both Sink and Range in Relation to the Cabinet Are Inconvenient. Counter Space Is Inadequate and Poorly Placed. Mechanical Refrigeration Is Preferable. Storage Space Is Wasted Under the Stove and Sink, and Two Broom Closets Are Unnecessary. The lighting Would Cause Shadows Over All Work Areas

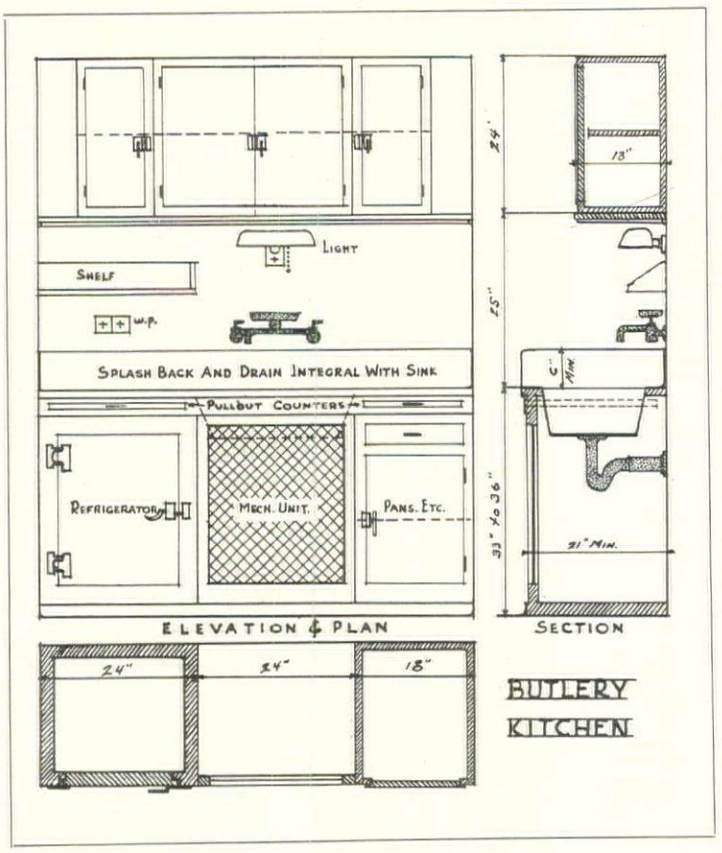
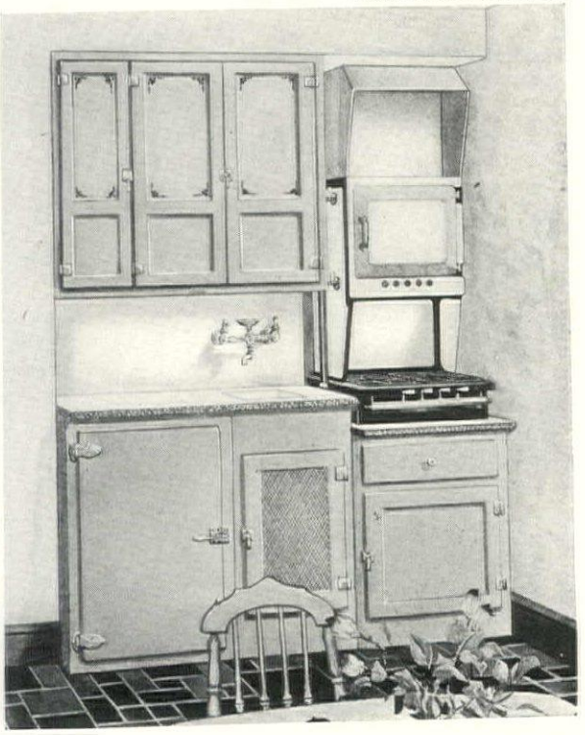


Figure 1. An Efficient and Compact Arrangement of Units. Door Swings Make the Interiors of Cabinets, Refrigerator and Cupboards Available Without a Change of Position. The Location of the Sink and the Pull Out Counters Give Adequate Working Space. Light, Wall Plugs and Shelves Are Placed for the Maximum of Utility. A Ceiling Light Should Be Provided, Switched Automatically by Enclosing Doors. The Butts of These Doors Should Cause No Interference with the Operation of Unit Doors. Metal Grille Should Be Entirely Removable for Access to Sink Trap and Mechanical Unit

A Poor Arrangement. Unit Doors Swing in Wrong Directions; Sink and Drain Installation Is Unsanitary and Difficult to Keep Clean, and Counter Space Is Inadequate. Units Are Cramped Behind Doors

Good Arrangement in a Small Area. Integral Sink and Drainboards Are Easy to Keep Clean. An Oven is Not Always a Necessity in Kitchen of This Size. Pull Out Counters, a Shelf and Wall Plugs Would Increase the Efficiency

Courtesy C. E. Sellers Co.



able in either wood or metal. Counters should be of a material that resists stains, is durable, and is easily cleaned, such as non-corrosive metal, enameled iron, or a composition material impervious to moisture. Sinks should be integral with drains and splash backs. Plumbing fixtures and mechanical units should be easily accessible, but protected from possible damage. Floors should be coved to bases, and small waste spaces difficult to clean are to be avoided. Smooth plaster or tile surfaces are best for walls, as rough textures collect dirt easily. They should be washable. A vented hood over the stove protects ceilings from dirt.

5. COLOR. A treatment to aid light reflection is the best. Walls, ceilings and equipment should be in the same general tone. Contrast in the color of detail aids visual efficiency, but should be simple and direct. Cabinet bases and other parts receiving hard wear and susceptible to stains and mars should be in dark, neutral tones. Simplicity is desirable, but extremes lacking a quality of cheerfulness are to be avoided.

TYPES

The efficiency of the small kitchen is established by layout, size and arrangement of equipment. Types should be chosen in relation to class of tenants, location and rental of unit apartments, and should be carefully planned for the minimum of installation and maintenance cost consistent with these considerations. There are three general types.

1. THE BUTLERY KITCHEN is a recent development for enclosed installation in one-room or studio apartments. No stove is provided, and in large projects it is used as a serving pantry in connection with a complete kitchen. (See Fig. 1.)

A. *Layout.* This varies with different projects. Planning considerations are easy availability, economy in relation to living space, and unit grouping for economy of mechanical installation. Doors should be provided for enclosure when not in use.

B. *Space.* The minimum practical width is 5 feet; the average is about 5 feet, 6 inches. The minimum depth should be about 22 inches.

C. *Equipment* should include refrigerator, 3 cubic feet in capacity, — with mechanical unit

Courtesy Wasmuth-Endicott Co.

The Counter Is Shallow, But Compartments Are Well Arranged for Service and Availability. Mechanical Refrigeration Would Give More Work Space and Increased Efficiency

Courtesy Wasmuth-Endicott Co.

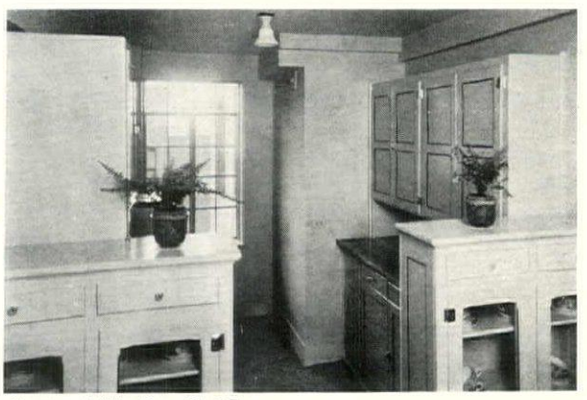
A Good Example of Built-in Units, Well Placed. The Tiling of Drain Boards and Splash Back Is Easy to Maintain. Compartments Are Easily Reached, But Cupboard Doors Swings Should Be Reversed for Maximum Efficiency. A Coved Base Integral With the Floor Is an Aid to Cleanliness

under sink; base cupboard for pots, pans, etc., with cutlery drawer; sink, 14 x 20, or 16 x 24, integral with drain board and splashboard. Pull-out counters are necessary for units of this size. China cabinets should be above the sink. Space should be left at both sides of cabinets to form shelves for storage of cleaning materials, etc. The sink should be set between the refrigerator and base cupboard, and the doors of these units should open in opposite directions *from* the center. Doors of cabinets should be similarly swung.

2. EFFICIENCY KITCHENETTE. This is a larger development of the foregoing. It is also for installation in a one-room or two-room "light housekeeping" apartment. The assemblage of units constitutes a complete kitchen in a shallow enclosed area.

A. *Layout and Space.* The layout of this type would be similar to that of the butlery kitchen. The minimum space—by using a gas refrigerator—is 5 feet, the depth 25 inches in the clear. Although the addition of cabinet units, etc., may enlarge the space to any desired length, the recommended size is about 6 feet.

B. *Equipment* includes refrigerator of about 3½ or 4 cubic-foot capacity, with mechanical unit under sink; base cupboard for pans with two



Courtesy White Door Bed Co.

A Practical Arrangement of Equipment. Space Is Wasted Under a Sink of This Type, But Conserved in the Stove and Refrigerator Combination. A Different Type of Lighting Would Obviate Glare and Shadows.

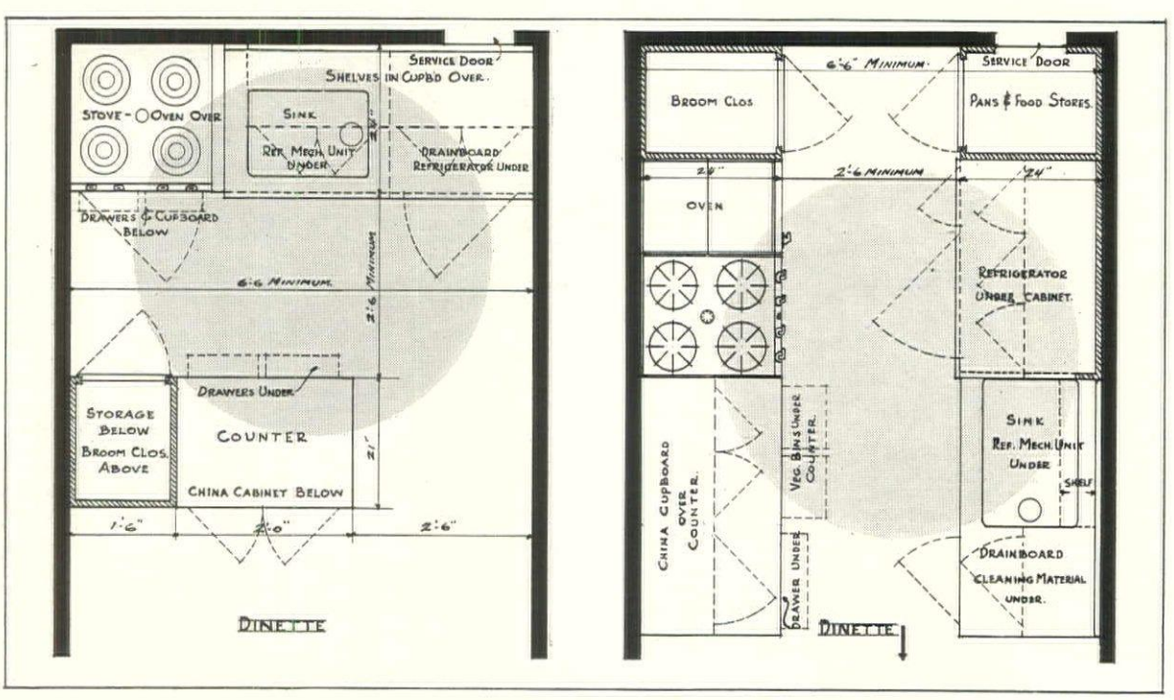


Figure 2. The Shaded Areas Indicate Compactness and Efficient Unit Arrangement in Two Typical Plans. Sizes in Equipment Will Vary, But the Dimensions Show a Minimum Practical Working Space

Courtesy of Herald Tribune Institute

The Kitchen Shown at the Left and in Plan at the Right Below, Is an Excellent Grouping for a Large Apartment Kitchen. A Change in the Model of Refrigerator, and the Installation of Cabinets Above It Would Conserve Space. The Use of Decorative Arches Is Not Essential to the Efficiency of the Room.

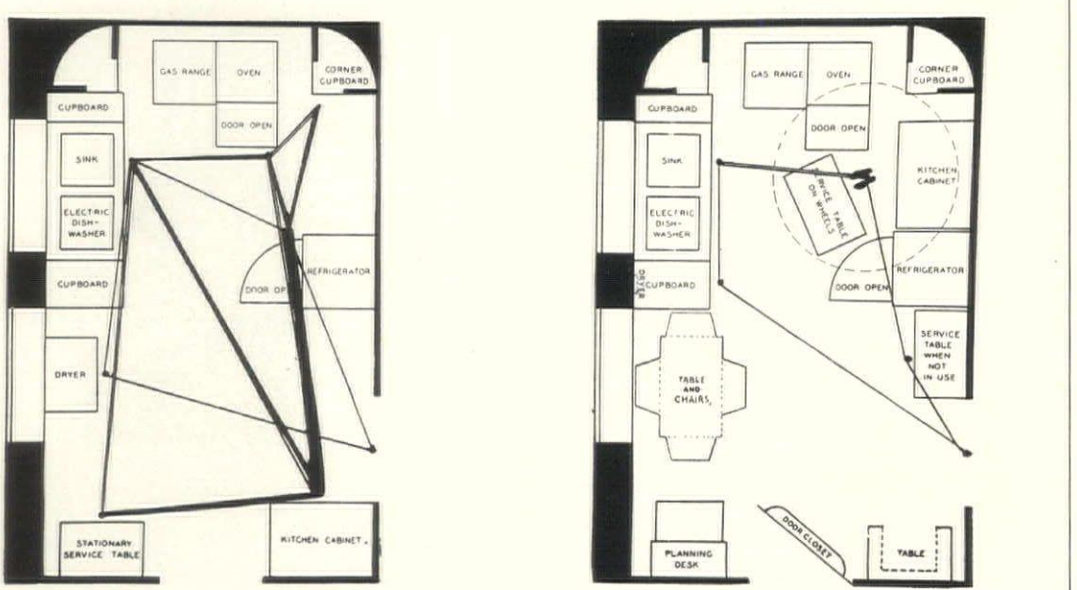
drawers and bread box; sink, 16 x 24, or 18 x 24, with integral drain and splashboard; pull-out counters; stove and oven with vented hood; cupboards over the sink with a shelf next to the hood.

The arrangement of both types should place all equipment and supplies within easy reach of a person standing at the counter.

3. KITCHEN AND DINETTE. Two general types are included under this heading. (See Fig. 2.) The first is a kitchenette with additional china and storage cupboards in connection with a dining space, for use in one- or two-room apartments. The second provides adequate facilities for apartments that include a living room and two bedrooms.

A. *Layout.* The combination of kitchen and dinette normally constitutes a room opening from the living room. Complete enclosure is not necessary in the small apartment, but some separation from the living room is usually desirable. A corridor service door should be provided. Dumbwaiter shafts should be located for non-interference with efficient arrangement of equipment units. If the space is enclosed, a window should be installed.

The Plans Below Show the Value of Proper Equipment Arrangement. A Typical Operation Involving 281 Steps in the Kitchen at the Left, Was Done With But 45 After a Rearrangement of Units Illustrated on the Right



Courtesy of Herald Tribune Institute

Courtesy Curtis Co.

(Left.) Details of Equipment That Save Time and Effort Are of Special Value in Small Kitchens.

(Right.) This Metal Closet Is But Six Inches Deep, Occupies an Otherwise Useless Space, and Provides Compact But Adequate Storage Space

Courtesy of Herald Tribune Institute

B. *Size and shape* vary with different projects. Typical layouts and minimum sizes are indicated in Fig. 2.

C. *Equipment* for the first type has been indicated. Units for the second should include a complete kitchen cabinet; four-burner stove with oven and broiler; mechanical refrigerator, 4 cubic-foot capacity; a sink, about 18 x 24, integral with drain and splashboards; cupboard with vegetable bins; storage cupboards with drawers; and cabinets for glass, silver and china. The size and location of units will vary with differences in layout, but should be considered in relation to compactness, comfort, easy availability and good lighting.

In apartments larger than those implied by the considerations mentioned, the kitchen usually becomes a room separate from others and should be developed as a unit space in relation to the requirements of the apartment layout. As in other types, the conservation of space and effort are important for comfort and efficiency.

Kitchens Should Be Planned With a View to Completeness as Well as Arrangement of Equipment. In All Types Space Should Be Considered in Relation to the Convenient Placing of Necessary Utensils

DRAFTING ROOM PRACTICE IN APARTMENT WORK

BY
LAURENCE AND JOHN SCACCHETTI

THE architect who has been commissioned to prepare plans for multi-family dwellings is immediately confronted with the problem of doing so in a minimum of time in order that the owner may be relieved of carrying charges which increase daily in considerable amounts. It is also to his interest to have the plans completed with a minimum of labor, as these projects are not usually full fee commissions, due to the fact that the owner, who is generally the builder as well, frequently maintains a skeleton architectural force of his own which is entrusted with carrying out those portions of the architect's service which have been omitted to reduce the cost of plans.

The division of the planning of the project, while it may result in an economy to the owner, is generally a prime factor in increasing the cost of the plans to the architect. It is obvious then that the architect who is to realize a profit on such a commission must rely upon a definite system by which his employees may be guided, in order that no unnecessary work or duplication of work be performed.

With mass-production methods injected into every line of endeavor, it seems inevitable that this system should eventually creep into the drafting room. It is now applied to the extent that draftsmen are proud to admit that they are specialists—not for a particular type of building nor a specialized form of construction, but experts in the development of detailed data for a portion of a particular type of building.

There is probably no type of building where "expertizing" has been developed to a greater degree than the apartment house. While sound apartment house planning is comparatively new, the place of the apartment in the world is very definitely established as the ultimate living quarters for all types and manners of urban and suburban people.

As the majority of people in metropolitan districts favor this form of living, a type of apartment must be developed to fit the purse of each class. It is due to this fact that mass-production methods must be applied in the drafting room.

SQUAD LEADERS. It is advisable, in the proper operation of a drafting room, to have a nucleus of squad leaders who are well versed in their branch of work, for in this manner the maximum efficiency is attained. Men who are trained in developing drawings for one type of apartment are either extravagant in the use of space or materials for a cheaper grade of construction, or too parsimonious in the use of these for higher grade work.

Another factor which has forced drastic action in drafting room methods is the intensive development of realty which has done so much to enhance land values. An owner is quite unwilling to allow his architect to experiment with an untrained force on a project where the daily carrying charges assume alarming proportions for even a moderate-sized project. A delay in the drafting room, even though of minor duration, may mean the difference between a paying venture and a failure. A holdup of this nature tends to inject a panicky feeling into all involved in the project. It leads to the issuance of incomplete or incorrect drawings which, in turn, leads to misunderstandings and errors in buildings and, of course, "extras" to be paid for by the owner.

STANDARDIZATION is the only remedy for inaccuracy and limited time. Oversystemization retards progress and clutters an office with files whose place should properly be taken up with men. The reduction of overhead depends a great deal on the drafting room efficiency.

THE "SET UP." In adopting methods of standardization, the system, to work properly, must start with the first line that is drawn. A sketch for a proposed building should not be started until all the requirements are known. Without drawing a line, it should be possible to pre-determine from tabulations on previous work, the approximate number of rooms available, from which is determined the best possible division of suites. Approximate cubes may also be worked up on this basis, which result may determine whether the scheme as outlined possesses the merits attributed to it by an anxious promoter or overzealous architect.

FIRST SKETCHES. Familiarity with all details concerning a site for an apartment building is an invaluable asset to the architect in making his first studies. If any savings on drafting room costs are to be made, the best time to conserve is at a project's inception. Almost invariably, the first scheme is also the last in the office of the architect who is familiar with this type of work.

The individual entrusted with the development of a sketch for a new project may utilize tables to considerable advantage in the preliminary

work. While these, at best, are "rule o' thumb," they have been found to be time savers. The tables here shown are examples of this. Though the plots used as a basis for comparison have been selected at random from a group of buildings recently erected, it should be noted that while the sizes and areas of the plots vary to a considerable degree, the net and gross average areas allowed to each room remain quite consistent, with just slight variation.

A sketch is more than an indication of the lot's possibilities. It should be considered as a preliminary working drawing. All legal requirements for exits, light and ventilation, construction, and the thousand and one details which are apparent when the project materializes should be taken into account before issuance. Usually these sketches should be accurately drawn at the scale 1/16 inch = 1 foot.

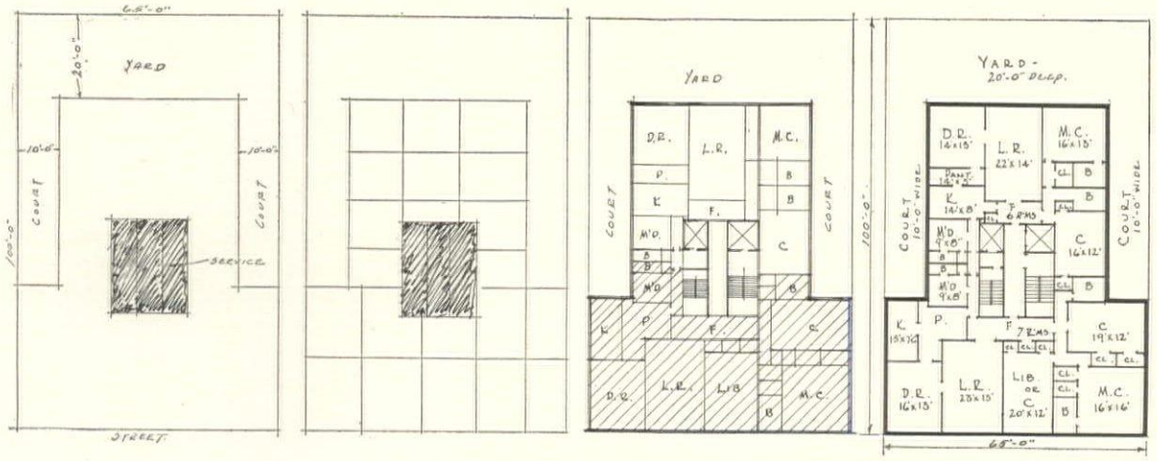
"RUBBER SKETCHES" are those optimistic rough layouts so called in the drafting room, due to the fluctuating and diminishing of room sizes and clearances, which should be avoided. In addition to making a bad impression on owners, whose spirits are bolstered with promises of large rooms only to have these hopes shattered when the sketches are converted to working drawings, they work incalculable harm in the drafting room. Much time is wasted in attempting to regain space on a plan which never existed, but was indicated on the "rubber sketch." If thicker walls are required for fireproofing or structural reasons, they should be considered at the time the sketch is drawn. Honesty is the best policy, particularly when the outcome will prove more disastrous to the offender than to the victim.

STARTING WORKING DRAWINGS. When the project materializes, it is essential that it be put through the drafting room in the least possible time. In speculative work the architect is rarely commissioned to proceed until all financial details are complete. This means that carrying costs are charged by the owners against the project from the day the architect is commissioned to prepare plans, and hence the necessity for speed and accuracy. It is at this point that the architect reaps the benefit of having a complete and accurate sketch, which may be taken and dimensioned for courts, yards, rooms, stairs, and in fact everything that is necessary to lay it out quickly and accurately. It is obvious that a small-scale study is better for "revamping" than the more cumbersome quarter-scale.

When dimensioned, the sketch is then laid out on tracing paper, and the structural engineers are consulted for column layouts which are worked out together with the architect. In the meantime small-scale studies of fenestration are being worked out from the figured sketch, and changes

TABLE OF AVERAGE AREAS

Size of Plot	Area of Plot in Sq. Feet	% of Lot Occupied	No. Apts. per Floor	No. Rooms per Floor	Gr. Area per Room Sq. Feet	Net Area per Room Minus Courts and Yards, Sq. Feet
CORNER BUILDINGS—CLASS A						
50x100	5,000	82%	1	12	417	342
57x120	6,840	80%	1	14	488	390
75x125	9,375	78%	2	21	446	348
40x120	4,800	83%	1	11	437	364
64x100	6,400	82%	1	14	457	375
75x90	6,750	80%	2	15	450	355
67x75	5,025	80%	1	11	457	366
100x110	11,000	73%	2	24	460	333
60x100	6,000	80%	1	13	461	373
100x150	15,000	76%	3	32	469	354
		Average			454	360
INTERIOR BUILDINGS—CLASS A						
50x120	6,000	65%	1	11	545	355
25x120	3,000	65%	½	5½ duplex	545	355
70x94	6,580	70%	2	13	506	354
66x100	6,600	70%	2	12	550	385
80x102	8,160	70%	1	16	510	357
		Average			531	361
CORNER BUILDINGS—CLASS B						
100x100	10,000	74%	5	22	3-4-5-6 rms.	
58x115	6,670	82%	5	14	2-3-4 rms.	
75x90	6,300	77%	2	15	420	325
50x100	5,000	80%	2	13	383	307
56x90	5,040	78%	3	14	360	280
110x110	11,000	70%	7	30	366	265
62x100	6,200	80%	4	16	387	311
		Average			383	298
INTERIOR BUILDINGS—CLASS B						
50x100	5,000	65%	3	12	417	270
75x100	7,500	70%	5	18	416	291
50x100	5,000	70%	4	12	417	292
80x100	8,000	70%	4	22	364	255
110x110	10,000	70%	6	22	455	318
88x110	8,800	65%	4	20	440	260
88x100	8,000	70%	4	20	400	255
		Average			416	278
CORNER BUILDINGS—CLASS C (*Non-Fireproof*)						
Irregular	12,000	77%	9	31	386	295
102x144	14,688	73%	11	41	360	262
100x100	10,000	80%	9	29	345	276
Irregular	21,944	76%	22	64	348	258
100x110	11,000	80%	9	32	343	275
100x145	14,500	76%	12	44	320	250
		Average			349	269
INTERIOR BUILDINGS—CLASS C (*Non-Fireproof*)						
Irregular	16,725	65%	9	39	429	278
100x131	13,100	65%	10	32	410	270
100x100	10,000	70%	10	24	416	295
100x100	10,000	70%	10	28	357	250
100x120	12,000	70%	10	30	400	260
100x110	11,000	70%	8	28	392	275
		Average			400	271



A B C D

Development of Preliminary Plans

A. Plot layout, Accurate as to Dimensions and Angles. Locate Mandatory Unoccupied Areas; Also Courts and Yards for Light and Ventilation, Thus Establishing Envelope. B. Approximate Number of Rooms Determined By Cross-Section of Average-Room Sizes for Class of Apartment. Determine Location and Approximate Area of Stairs and Services. C. Divide Area Into Approximate Actual Rooms, Considering Orientation, Circulation, etc. D. Develop Plan and Balance Units

in walls and partitions are made before the engineers have advanced too far with any definite framing. Mechanical and sanitary engineers are also provided with the preliminary data in order to be made acquainted with the project. The architect will also avail himself of the engineering advice maintained by all elevator companies to obtain a layout for architectural and structural purposes. In this manner loads and impacts on beams and columns are definitely determined at the proper time, requiring no revision of structure at a later date.

CONCURRENT PLAN DEVELOPMENT. The alert captain will obtain prints of the preliminary typical or governing floor layout when sufficient dimensioning has been done, and distribute these drawings to other men for the purpose of laying out upper or lower floors, or other arrangements varying from the general layout. First or ground floor plans are studied for entrance requirements; cellars are sketched out to develop a scheme of circulation for service and equipment; upper floors are studied with an eye toward conserving space where setbacks or other legal limitations restrict the layout.

SECTIONS. Preliminary sections through the building are started as soon as the typical floor arrangement is settled. Only in this manner may the always serious problems of stair headroom, curb lines and grades be settled. Beam depths are assumed prior to the receipt of framing plans. For each type of house, experience only can show which depth beam is most economical to use for uniform, symmetrical and inexpensive framing.

SCHEDULE OF DRAWINGS. One may gather from the foregoing that the development of apartment houses is nothing more than a series of guesses, each subsequent guess being a little more accurate than its predecessor. It is only by assumption that a definite result is obtained. Moreover, the assumption is not confined merely to drawing; it is also used extensively in scheduling the project for the proper coördination of all work common to commercial architecture. The director in charge of a project will usually schedule it for its various stages in order that he shall at all times be familiar with and be in position to determine the status of a project by merely glancing at his data sheet. This may be arranged in the form of a graph, a chart, or by memoranda. A system which is quite simple is illustrated herein. Fig. 1 shows a chart for an apartment building from its first stages to the period of filing in the municipal bureaus. This type of schedule permits laying out work for a period extending from a few weeks to several months. The diagram is a simple affair, which may be drawn out and run off on a mimeograph at a very small cost.

The squad leader at the job's inception, will estimate from experience the time required for developing each drawing and may, if he so desires, write in the names of the men working on each sheet. If properly worked out, one will not find a discrepancy or variation exceeding 5 per cent in the length of time required to carry a project through to the various stages of completion. Moreover, a constant check is maintained over work not being directly handled in the office. The assumed time is of course shown on the chart in a black, unbroken line. Changes in the schedule may be made with crayons, such as red for work behind schedule and blue for drawings in advance of the time slated for their issuance.

LEGAL REQUIREMENTS. In preparing drawings for examination in the bureaus, it is imperative that all legal phases be amply covered. Avoidance of the issue or incomplete data will never

escape the eye of the trained examiner. Vague information or ambiguous notes will serve only to aggravate the official and make him more cautious, causing delay on an approval. A thorough knowledge of all legal requirements combined with experience to show a minimum of confusing information, will go a long way toward securing a speedy approval. The departments are not concerned with decorative features, nor whether the flooring is to be of a stock or a special pattern. Only those doors which affect egress or privacy need be shown on filing plans; no mention need be made of wall or ceiling treatments; closet dimensions are superfluous. Briefly, only the work involving structure, light and ventilation, fire precautions and sanitation need be indicated. Information other than this means wasted effort for the examining authorities.

The legal requirements may, for our purpose, be separated into four main subdivisions as follows:—

1. Height and Bulk of the building, which are regulated by any existing zoning ordinances and which deal with the percentage of the lot which may be occupied by the building and the height at the street front, the minimum area which required yards and courts may contain for given heights, as well as any permissible setbacks, dormers or pent houses. This does not, however, include any private restrictions which may exist in certain localities.

2. Light and Ventilation, which in addition to any yards or courts required under the previous heading, include additional open spaces from which rooms are to receive legal light; the minimum permitted sizes of living rooms, kitchens, bathrooms and water-closets, etc.; the minimum sizes and areas of windows serving these spaces; the sizes of alcoves or alcove rooms when and if permitted, and the openings between them and legally lighted rooms; the method of ventilation for bathrooms, water-closet compartments and other spaces not in direct contact with the outer air; and the required number of air changes if mechanical ventilation is to be used. Under this heading may also be included the division of certain rooms by the use of low or dwarf partitions or such fixed equipment as may by law be permitted, such as china closets or dressers between kitchens and dining alcoves.

3. Fire Protection; which concerns the minimum number of exits from apartments, the minimum number of stairs, fire escapes, fire towers, horizontal exits, stair halls, elevators, elevator shafts, elevator vestibule, public halls, corridors, the minimum permitted size for each, their location; the method of separating them from the living portions of the building and from each other. Also any required standpipe and sprinkler lines, their tanks, hose, hose racks, pumps and any lot line windows and doors or those windows and doors which may be on yards or courts of less than certain specified dimensions.

4. Sanitation, which deals with the minimum number of water-closet and bathroom accommodations required, plumbing fixtures, soil, waste and vent lines, water supply lines, heating apparatus, etc.; also the permitted uses for certain portions of residence buildings for other than residence purposes, as well as the privacy of rooms and bathrooms from other rooms.

All of the foregoing requirements are to be met in both the fireproof and the semi-fireproof types buildings, although they vary for each type of building to a considerable extent.

This, then, completes the plans for examination. An office that is properly equipped to handle this type of work may generally proceed with reasonable speed in the development of drawings to the next stage, even though the plans are in the hands of the municipal authorities. Having a good working knowledge of the laws, the examination is regarded more or less in the nature of a check. No intentional violation of law having been committed, it is fairly safe to proceed with the completion of drawings for estimating.

DRAWINGS FOR ESTIMATING. It is at this point that accuracy in the previous stages of the work is of material benefit. The tracing paper drawings which were used for filing are as a rule somewhat abused, due to re-study, changes and corrections, due to structural or mechanical conditions, and are likely to be somewhat out of scale. Estimating plans must be accurately drawn in order to bring out all those conditions which ordinarily constitute extras if not properly shown. As these drawings form the basis of the contract, they must be complete and accurate for their purpose.

If it is the intention to issue the drawings at stated intervals for estimating by various trades, one system is employed. On the other hand, if the project is slated to be sent out for general contract bids, another method must be followed.

SUBCONTRACT METHOD. If the former is the method decided upon, the project is scheduled as hereinbefore stated, substituting the chronological order of trades as they would be employed on the work; for example, the data required for foundations, masonry, steel, concrete and concrete floors, together with sufficient other incidental information in connection with these trades to avoid extras, are shown and the drawings issued. Other trades follow in their proper sequence until the final drawings are ready for the complete structure.

GENERAL CONTRACT DRAWINGS. In the case of a general contract, the drawings are

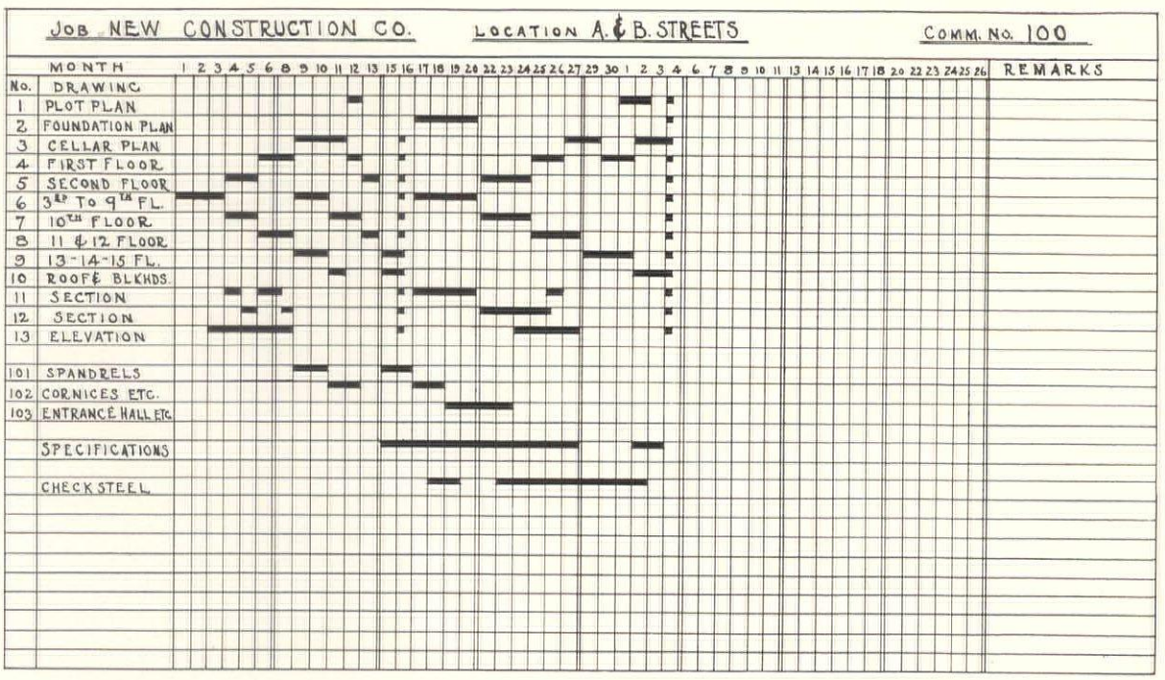


Fig. 1. Drawing Schedule Showing Dates of Work on Drawings. Two Weeks Are Here Allotted to the Set for Filing with the Building Department, and Three Weeks More for Completion of the Contract Drawings

withheld until all trades are properly covered with sufficient data to present a complete picture by implication, if not actually shown. Specification and schedules of finishes are rough-drafted and gone over by the squad leader and the specification man. Here again a great deal of time may be saved by having a complete specification file. Where sufficient data are available from other buildings of like characteristics, a specification may be taken bodily, and by employing a system of insertions and corrections or cutting out and pasting in revised paragraphs, a specification can be developed very quickly for checking with the owner's requirements.

CHANGES. As changes usually involve considerable expense in the drafting room, a constant check must be maintained over all drawings. Where structural or mechanical information is not forthcoming at the proper time, revisions of the drawings to incorporate the delayed data are bound to occur. This delays the work, tends to demoralize the draftsmen, who quickly lose interest, and increases the chance for errors. Sufficient larger scale details should be worked out and the information transmitted to the consultants. Spandrels, cornices, and exterior details must be drawn for the structural men; special methods for running piping, or minimum clearances for the passage of duct work must be passed on to the mechanical engineers. Unless this is done they must either assume a solution or delay the work until properly informed, both inefficient practices.

Coördination of all the elements involved in the proper conduct of an operation is the secret of successful handling of commercial work. Consider what one day's delay on the part of the consultants, due to lack of information, may mean to an architect who has a group of men delegated to a project. He may force the work to go on regardless of the consequences, resulting in perhaps two or three days of changing to suit the final condition, with the chance of errors of omission or commission creeping in.

DETAILS OF ESTIMATING DRAWINGS. Estimating plans are considered as such only when all the points governing the trades involved are covered. Checking lists should be employed and all discrepancies noted on a sheet, and as each correction is made, crossed off the list. By this method the chances of a slip-up are quite remote. For estimating purposes the drawings need not be completely dimensioned; equipment need be merely indicated, and even the correct location or swing of doors, definite position of lighting, radiation or plumbing if not far off from its final location need not be shown. Furred spaces, and indication of materials and finishes and structural requirements are of course imperative for a complete estimating plan. Small-scale studies of interior arrangements are of great benefit and generally expedite the figuring of an estimate and minimize the number of questions to be answered

regarding them. These are useful to the architect who, as a rule, shelves the project during its early stages of construction and remembers it only when the call comes for details, at which time a small-scale idea will go a long way toward refreshing his memory.

CHECKING. When the plans have been issued for estimating purposes the man in charge will coördinate all branches of work and settle on a definite policy of completion.

The plans are checked for general dimensions in order that the framing may also be checked for position. Spandrel beams are checked for masonry, window or door clearances; interior framing is placed with regard to shaft and hatch clearances, with proper fireproofing allowance. Other framing is studied for symmetry and spacing. When this has been located on the typical floors, a re-check is made to establish beam levels and clearances to allow for horizontal pipe or duct runs. Notations of changes are made as desired on either structural or mechanical plans. Familiarity with a project will permit a checker to bear in mind the intent of the architectural plans and be guided accordingly in his corrections. It is unnecessary to fully complete the checking for an entire project at one time. While other sheets are in progress of checking, those bearing notations may be returned to the engineers for correction. In this manner all those interested may be furnished with sufficient information to keep the project moving. Additional corrections are bound to occur, but these can quickly be picked up and the changes made without delay. This procedure is followed until all scale drawings are complete. The plans then receive a final check against the specifications, and the necessary corrections to the former and addenda to the latter are made. The construction plans are now complete.

DETAILING. No work can be carried along very far without details. Even though a portion of the work would not be affected for a considerable length of time, it is advisable to detail it while the draftsmen still have the "feel" of the work. Those details peculiar to each project are likely to become hazy if this important work is shelved until actually needed for construction. Furthermore, large-scale drawings bring to light numerous defects in plan or design which may easily be remedied by a revision issued before that portion of the work is reached. If some details are worked out in conjunction with shop drawings of work previously detailed, the entire project may be correlated and the amount of drawing considerably reduced.

SHOP DRAWINGS should be checked immediately when received. They may often bring to light defects in drawings previously issued, requiring revisions to the work of other trades. A tickler system of cards may be employed to show when shop drawings governing certain trades should be in the architect's office. This system of expediting work of subcontractors is as useful to the architect as it is to the owner or builder. An office that does considerable work may delegate a clerk to investigate the tickler file and bring these cards to the attention of those interested. Otherwise the squad leader may handle this item in conjunction with the rest of his schedules.

No project is complete in the drafting room until the last nail is driven in the building. It has never been possible to carry a project through to completion without some correspondence or telephone calls. The type of drawings and the administration of the work will be made apparent when requests for information or interpretation come through. If these are reduced to a minimum, the project's costs and attendant overhead will show up favorably.

SUPERVISION. The supervision should be entrusted to one who has had sufficient experience to realize the necessity for adherence to the drawings, and with a mind broad enough to render decisions where variations are made necessary by conditions, always keeping in mind the legal requirements governing, and not permitting the installation of any work that will reduce clearances or constitute a hazard or a legal violation.

While the foregoing suggestions may be applicable to most offices in whole or in part, it must be remembered that the type of work as well as the temperaments of the individuals involved preclude the possibility of making a definite recommendation for the management of all work. Each office must have its own system built around it to fit its structure. Constant changing of system does more harm than good. Efficiency in drafting room methods can be obtained only where the employes are well trained for their particular work, whether it be planning, designing or detailing.

MECHANICAL AND ELECTRICAL EQUIPMENT

BY

HENRY J. NELSON, M.E.

OF THE OFFICE OF SCHWARTZ & GROSS, ARCHITECTS

A GREAT deal has already been written regarding the mechanical equipment and features of the office building. This article will attempt to show how the design of the mechanical and electrical installations of an apartment house and apartment hotel of ordinary size differ from the tall buildings. It might be well to keep in mind the fact that office buildings are built for a large number of persons per unit of area, whereas apartment houses and apartment hotels are built as living places for a small number of people per unit of area. Also in the latter each tenant has his individual tastes and idiosyncrasies.

The cost of the structure, the rent schedule, location of the property, type of management and other factors, all tell the engineer what type of installation to design and what the expense of the mechanical equipment can be. Of course, there is an absolute minimum below which the engineer will not attempt to equip a building, but as a general rule, he must work within a budget.

His design will not necessarily be the most economical at all times, for the engineer must sacrifice economy in design to suit architectural treatment as will be illustrated later. In spite of that, all systems must be flexible and simple to operate, inasmuch as the superintendent of the building must be able to control and make minor repairs of all systems himself.

Competition in renting has forced the owners and builders to design their buildings to give more to the prospective tenant for the same rent than the next owner. The rooms given most attention in this matter should be the bathroom and kitchen, where, for a small increase in building costs, the owner achieves a noticeable effect.

BATHROOM

In the apartment hotel one finds bathrooms of moderate size with medium priced plumbing fixtures of sturdy construction and good wearing qualities, for this type of tenant will give hard usage. Here, everything is very simple, like the hotel bathroom, with the necessary bathtub with shower over, lavatory and water-closet. Colored fixtures are not usually installed as these apartments may be used by a great many people for short periods and the expense is unwarranted.

Since the passing of the Multiple Dwellings Law, in New York, it is possible to have secondary interior bathrooms in apartment houses, and the engineer is now required to provide adequate ventilation for these rooms. This is accomplished by connecting each bathroom to a large fan by duct work, the fan located at the roof level. Great care must be taken that the system will operate without noise. To this end, the engineer must design a balanced system with low velocities. Grilles are placed in each bathroom connection with louvres for control.

In the better class apartment house, we find color being used extensively, usually only upon request of the tenant, as otherwise renting troubles will start, because the color selected for a given apartment may not be to the tenant's liking. Bathrooms should be designed so that they are as noiseless as possible. The engineer may help in this respect by arranging his fixtures in such a manner that local noises are confined, and by reducing the velocity of the water.

PLUMBING

In the best apartment houses the materials which go into a plumbing system proper are of the best qualities. The best pipe is generally used throughout for both hot and cold water systems, galvanized wrought iron is used for vent lines; all soil, waste, drainage, sewers and leaders 3 inches and over are constructed of extra heavy cast iron pipe with bell and spigot joints and similar fittings; all such piping smaller than 3 inches is usually galvanized steel pipe with galvanized recessed drainage fittings. All vent piping is standard galvanized steel pipe with galvanized cast iron fittings, except where extra heavy cast iron pipe is permitted.

KITCHENS

The kitchen is sometimes ventilated by an electric kitchen fan mounted either in the window or in the wall. This fan not only eliminates all cooking odors but relieves stuffiness.

The electric requirements for a kitchen are varied. Provision must be made for refrigeration, cooking, dishwashers, toasters, heaters, beaters, and electrical appliances of all sorts. This is essential in the larger apartments where a great deal of entertaining is done. Such equipment frequently requires heavier wiring as well as more convenience outlets.

KITCHENETTES

As a general rule, kitchenettes are ventilated through a duct system similar to that for interior bathrooms, with a fan located at the roof of the building, and this system eliminates all cooking

odors, so that the one-room apartment may appear as a living room of a large apartment. Lighting, in the kitchenette, is provided generally by a drop light, and adequate provision must be made for cooking, either by power electric outlets or by gas.

HEATING

The greatest heating problem arises in studio apartments, especially if the studios are one and a half stories high. Here one side of the room is glass in its entirety, requiring a great deal of heat with no place to put the radiation. In such cases the convection type of radiator is often the solution.

Usually the walls are recessed to receive these radiators and the radiators finish flush with the wall. Where there is a set-back roof and doors as well as windows open onto it, radiators are placed under the step leading to the set-back roof or set in an unimportant room adjacent with grilles to allow hot air to enter.

LAUNDRY

Nearly all apartment houses and apartment hotels have provisions for laundering located in the cellar. A combination sink and wash tray in the kitchen is used by the tenant mostly in cases of emergency, and the main laundering is done in the cellar, where porcelain wash tubs are arranged in batteries, with gas burners for boiling between each pair of tubs, and wringers and other modern equipment are provided. A separate room should be provided as a drying room and another as an ironing room.

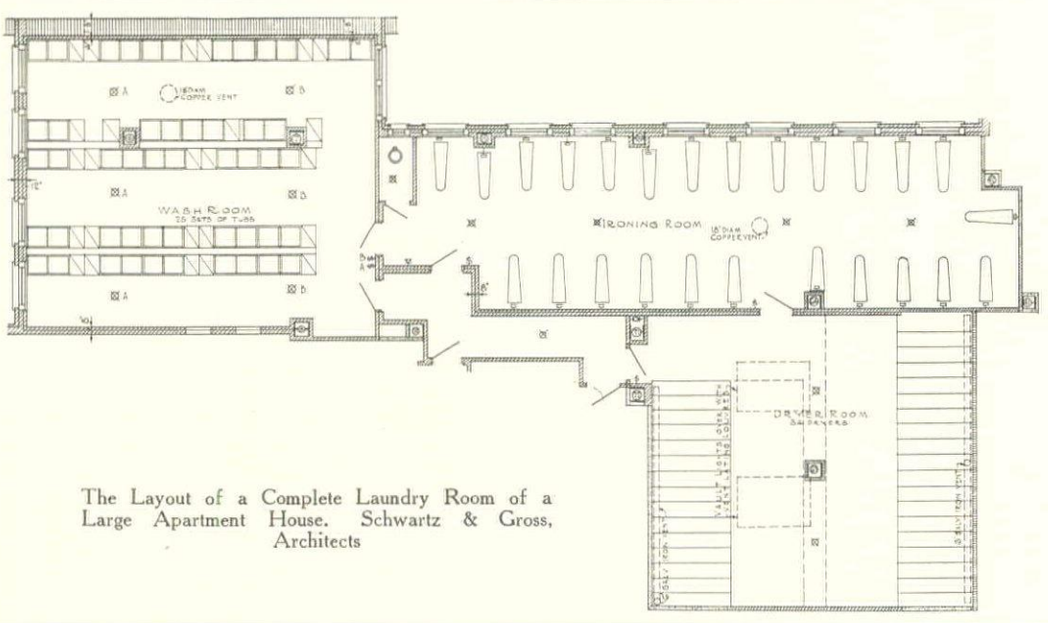
In the drying room metal drying racks should be installed, usually one for every three or four apartments, arranged in file. The clothes are dried either by gas burners or steam coils located under the racks. A lock is provided on each rack so that clothes may be safely left.

In the ironing room, ironing boards of the same number as drying racks should be installed. The boards must be of very sturdy construction completely covered and ready to use. Boards are arranged, systematically so that ample space is provided for all paraphernalia. A typical laundry layout for a large apartment house is shown.

Electric layout for the laundry is simple, washroom and drying room requiring but ceiling outlets for general illumination. The ironing room has a convenience outlet at each board for the electric iron and a drop light fixture over each board, or general lighting.

The ventilation of the laundry is a serious problem and it is advisable to get as many windows in this space as possible. An exhaust system of ventilation should be installed to rid the laundry of excessive heat and laundry odors. In the better type apartment house this exhaust system is frequently installed in conjunction with the ventilating system for the first floor, service rooms and servants' quarters. In the cheaper type apartment house free air exhaust fans are installed in the laundry windows and air circulated from other parts of the cellar. In such cases where even this expense is not warranted, a 6-inch galvanized vent is provided from the dryers to the outside air and an 18-inch copper vent from the wash and ironing rooms.

The electric system for multi-family homes usually requires a transformer vault to change the high tension alternating current to low.



The Layout of a Complete Laundry Room of a Large Apartment House. Schwartz & Gross, Architects

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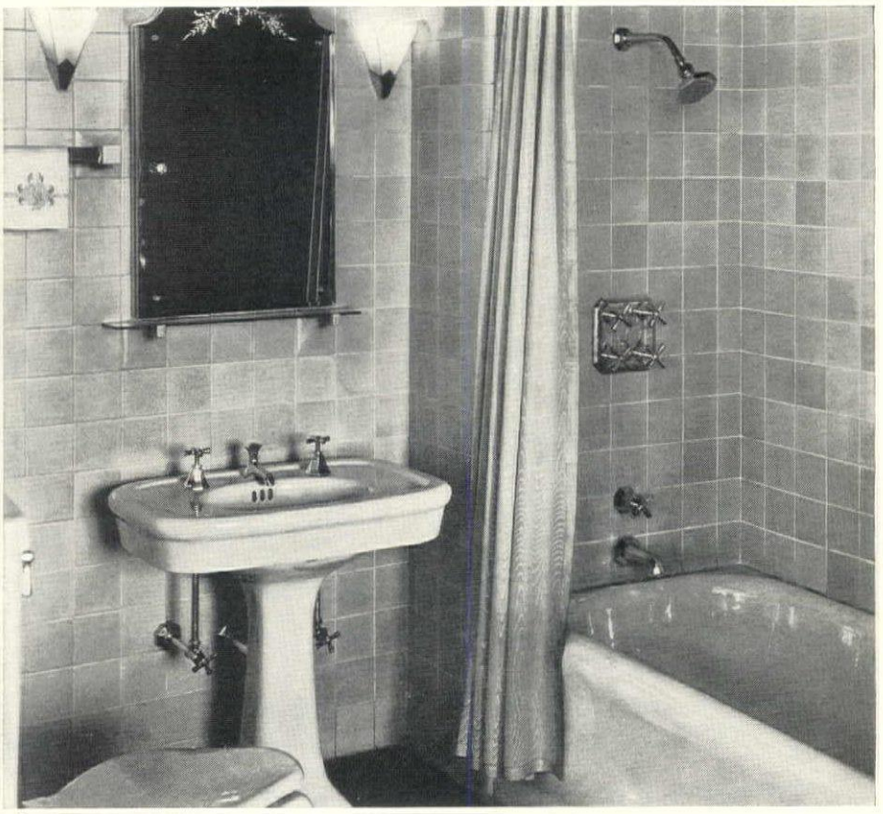

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•

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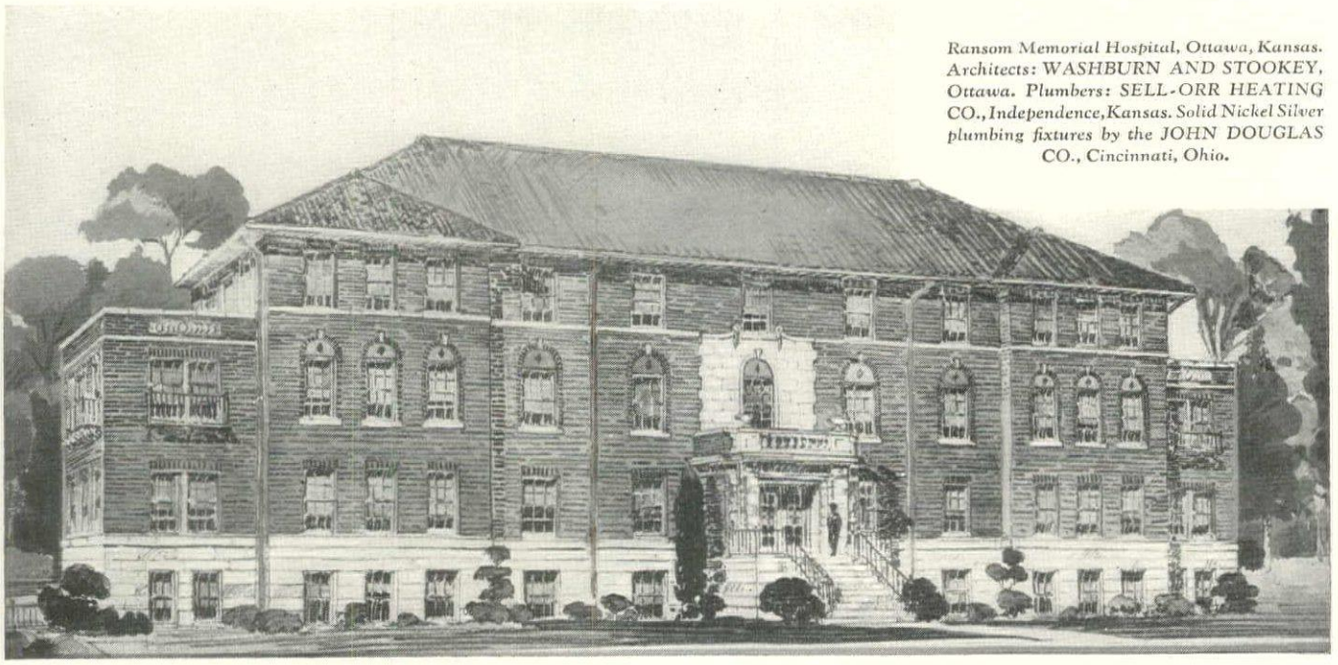
PLUMBING FIXTURES

MEETING ARCHITECTURAL STANDARDS OF QUALITY



Ransom Memorial Hospital, Ottawa, Kansas. Architects: WASHBURN AND STOOKEY, Ottawa. Plumbers: SELL-ORR HEATING CO., Independence, Kansas. Solid Nickel Silver plumbing fixtures by the JOHN DOUGLAS CO., Cincinnati, Ohio.

SOLID NICKEL SILVER PLUMBING FIXTURES BY DOUGLAS IN RANSOM MEMORIAL HOSPITAL

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Above illustration shows slop sink equipped with Solid Nickel Silver fixtures by Douglas.

18% to 22% Nickel SILVER

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No expansion tank required

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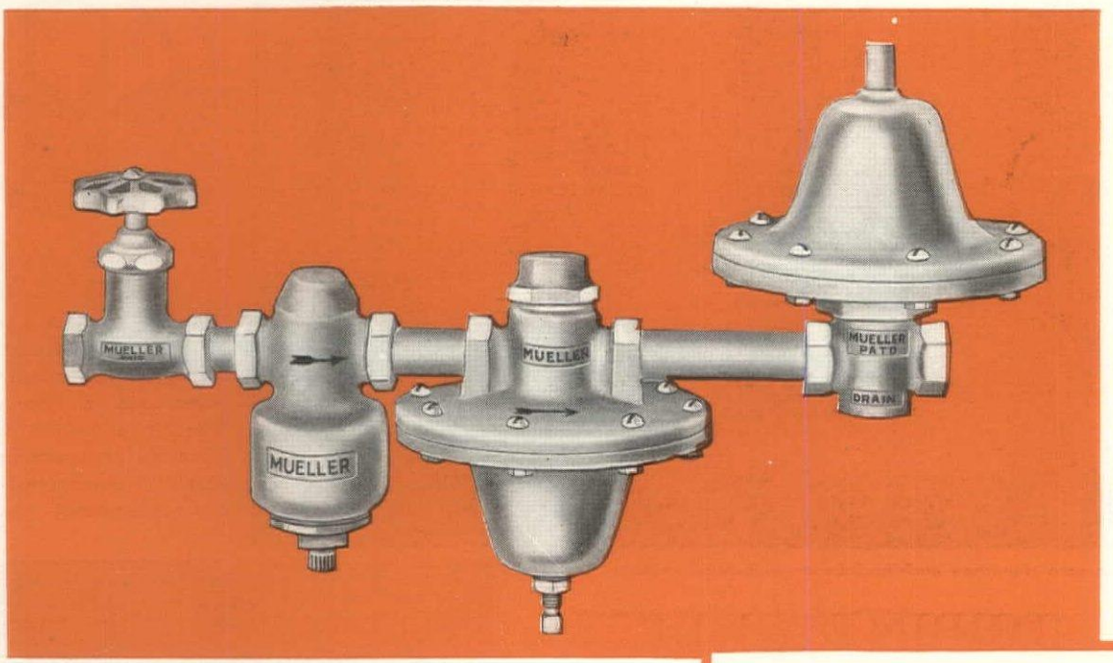

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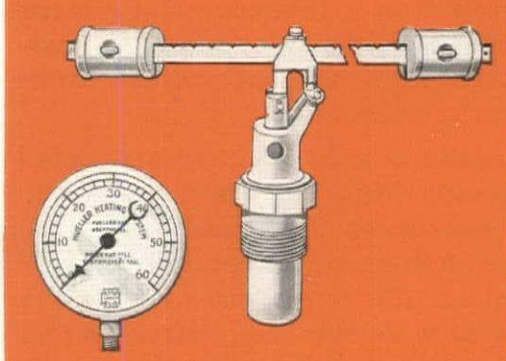
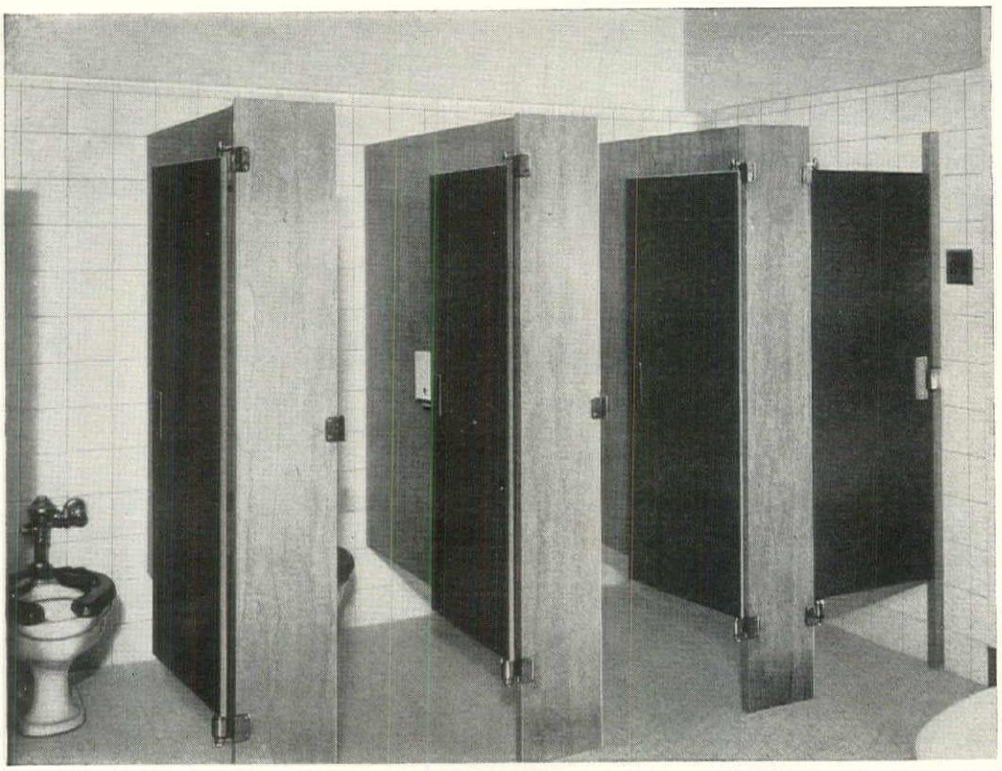
5. Substantial fuel saving due to damper control and faster circulation.



MUELLER

AUTOMATIC SYSTEM OF HOT WATER HEAT CONTROL



By Permission of the New York Stock Exchange Building Company

Veneer-Steel
TRADE MARK REG.

IN OFFICE STRUCTURES PARTICULARLY

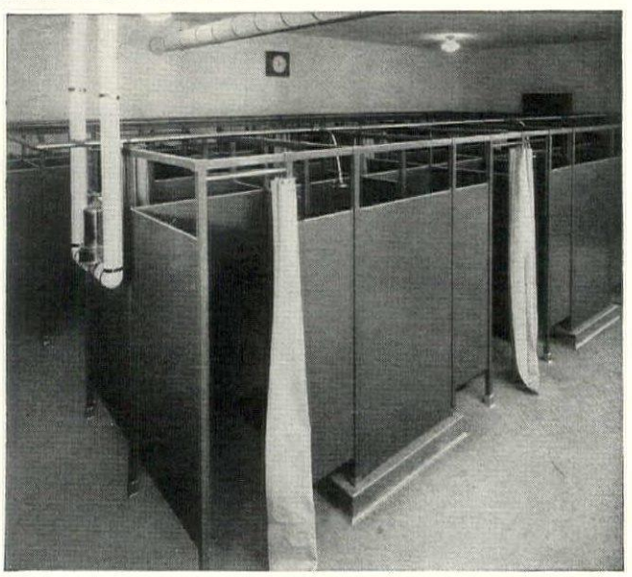
Veneer-Steel sound-proof doors on partitions of marble, structural glass, etc., have found great acceptance in office structures. The hinge used is the famous Hart & Hutchinson ball-bearing gravity type—proved insurance of trouble-proof performance.

. . . DEPENDABILITY HAS BEEN PROVED

VENEER-STEEL Partitions for toilets, showers, dressing rooms—for ward screens and dwarf partitions in hospitals—have thoroughly established their dependability. Here are partitions that will stand up against rough use, time, hot and cold water, and excessive temperature changes.

Veneer-Steel Partitions and Doors are rustproofed, noiseless, non-absorbent and flush-type. They are built of *galvanized* sheets overlaid on a fibre core and cemented thereto with all edges soldered. All posts and wall attachments are sherardized inside and out after fabrication.

Hardware solid white brass buffed bright or pressed brass chromium plated. Because Veneer-Steel Doors and Partitions are solder sealed they are impervious to moisture and cannot absorb or retain odors. Standard finishes for Veneer-Steel Partitions and Doors are olive green and grey. Special finishes and wood grains can also be supplied.



CONCERNING GALVANIZING

W. T. Flanders of the Malleable Iron Fittings Co. says in his book: "GALVANIZING and TINNING"

"IT has not yet been discovered how to regenerate steel. Until such a discovery is made we are compelled to resort to embalming.

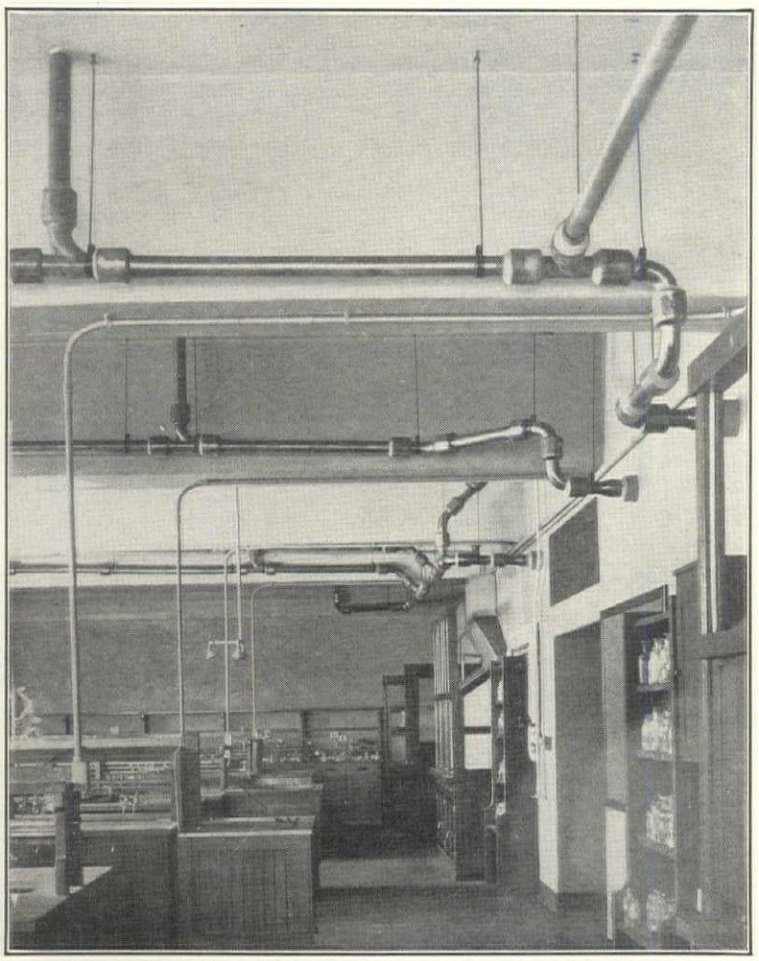
"The metallic method of embalming consists of coating the steel with some other metal, and zinc is without doubt, the best protective coating for iron and steel."

Veneer-steel Partitions and Doors are galvanized.

Complete details found in Sweet's or send for bulletins

THE HART & HUTCHINSON COMPANY

BRANCHES IN NEW YORK CITY, PHILADELPHIA AND BOSTON
FACTORY—NEW BRITAIN, CONN. . . AGENTS IN OTHER PRINCIPAL CITIES



View in Chemistry Laboratory—OHIO STATE UNIVERSITY.
The Chemistry Building at Ohio is equipped with KNIGHT-WARE Sinks, Waste Lines and Ventilating Ducts.

These institutions are equipped with KNIGHT-WARE

PRINCETON UNIVERSITY
Chemistry Building
COLUMBIA UNIVERSITY
Chemistry Building
WEST VIRGINIA UNIVERSITY
Hall of Chemistry
OHIO STATE UNIVERSITY
Chemistry Building
Pharmacy Building
JOHNS HOPKINS UNIVERSITY
Chemistry Building
Hygiene Building
Biology Building
NEW YORK UNIVERSITY
Chemistry Building
WASHINGTON UNIVERSITY
Biology Building
DUKE UNIVERSITY
Chemistry Building
PURDUE UNIVERSITY
Chemistry Building
Pharmacy Building
PENN STATE COLLEGE
Chemistry Building
LAFAYETTE COLLEGE
Mining Engineering Hall
BATTELLE MEMORIAL
Chemistry Laboratory
McGILL UNIVERSITY
Pulp & Paper Research Bldg.
COLUMBIA PRESBYTERIAN
Hospital Centre

GUARANTEED SATISFACTORY — MAURICE A. KNIGHT CHEMICAL STONEWARE — ACID-PROOF CHEMICAL STONEWARE

KNIGHT-WARE

"IT IS THE BODY ITSELF"

Specify Knight-Ware Because it is—

Positively *acid, alkali* and *corrosion proof* regardless of strength or temperature of solution . . .

Tough and *Durable* and resists abrasion to the highest degree . . .

Economically and *easily* installed. Hung in the same manner as any other material, one hanger per length on horizontal lines and one support per ten feet on vertical risers only being required. Joints are economically made and easily poured and will withstand fully 20 pounds pressure . . .

Less expensive than silica irons and most other acid-proof equipment . . .

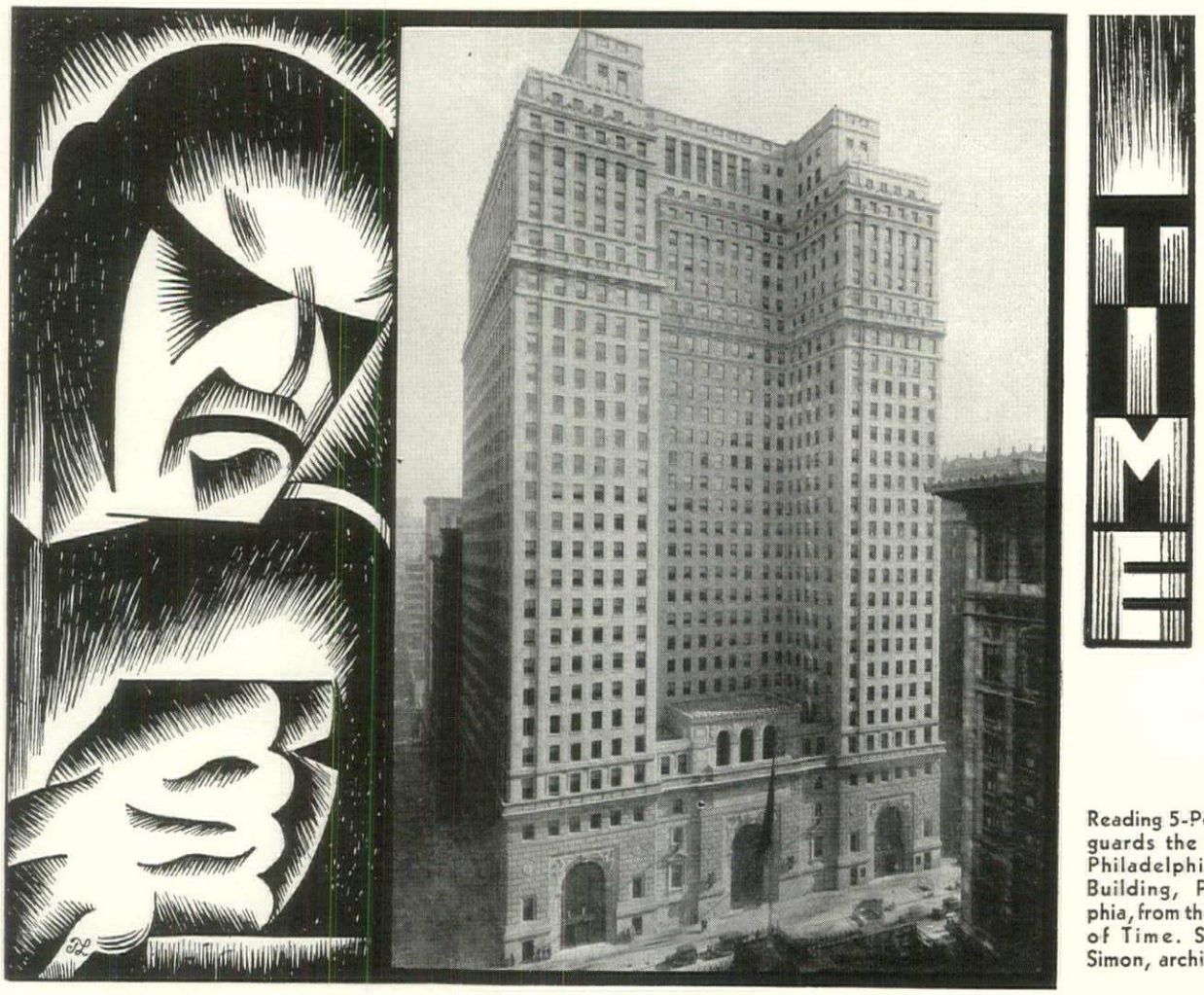
Permanent. Will last the life of the building in which it is installed.

MAURICE A. KNIGHT

OFFICE AND PLANT
AKRON, OHIO

New York City	Chicago	Philadelphia	St. Louis
804 World Bldg.	230 N. Canal St.	1600 Arch St.	1st Nat'l. Life Bldg.
Beekman 1657	Franklin 4658	Rittenhouse 6300-6301	Main 1784

San Francisco	Niagara Falls	Montreal, Que.
Merchants Exchange Bldg.	309 United Office Bldg.	1307 Notre Dame St., W.
Douglas 375	Niagara Falls 507	Main 2625



Reading 5-Point Pipe guards the Fidelity Philadelphia Trust Building, Philadelphia, from the attacks of Time. Simon & Simon, architects.

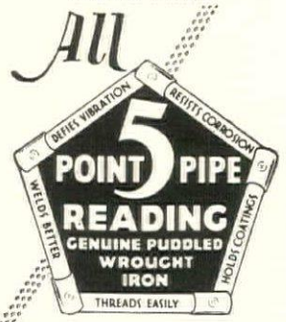
WHATEVER ELSE YOU CUT—

Once you have specified rust-resisting Reading 5-Point Pipe, *make sure that it remains in your specifications.* To substitute inferior pipe on the basis of first-price alone is to strike at the arteries of your building—to make it obsolete before its time. Over and over again, Time—That Tough Old Tester has proved that inferior pipe means higher operating costs per year of service—constant repairs—probable replacement of the entire pipe system within a relatively short time.

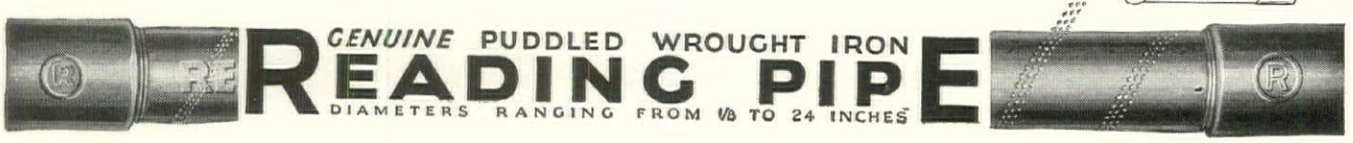
Reading 5-Point Pipe, being made of the original Genuine *Puddled* Wrought Iron, repays its first price many times by insuring freedom from pipe replacement *throughout the entire life of the building.* Whatever else you cut, let this long-lasting pipe remain—the greater life-span of the building will approve your wisdom.

READING IRON COMPANY, Reading, Pennsylvania

For Your Protection, This Indented Spiral Forever Marks All



Use only Reading 5-Point Nipples with Reading 5-Point Pipe . . . you'll know them by the indented spiral band.



Science and Invention Have Never Found a Satisfactory Substitute for Genuine Puddled Wrought Iron

He Took Up the Draftsman's Pencil to Battle Constipation

The daily output of a lathe operator drops. A child grows listless and inattentive as the school day drags into afternoon. An office worker slumps idly at his desk, neglecting the work before him.

The boundless energy that drove a business genius to the top rung of the ladder, slips silently away, leaving only a dull clod of a mind and body.

Yet doctors tell us that constipation is really nothing but a habit—or rather the lack of one. It is a chronic disorder, of millions, induced by irregular evacuation during youth.

The Clow Soldier of Sanitation took up the draftsman's pencil to fight this enemy of modern man and industry.

His first attack was for the coming generation. It resulted in a closet bowl, efficiently designed to make evacuation easier and more certain for school children.

For many years careless designers had been inflicting high bowls upon children in school toilet rooms.

The seat of the Clow Bowl was lowered, 2 inches closer to the floor. The position of the child is natural, with knees high and stomach muscles relaxed. Thus by making evacuation easier, regularity is made more of a habit.

Following this first bowl have come others on the same idea to help grown-ups in all walks of life.

And the Soldiers of Sanitation score another important victory in their battle against uncleanliness, pollution, ill-health and inefficiency.

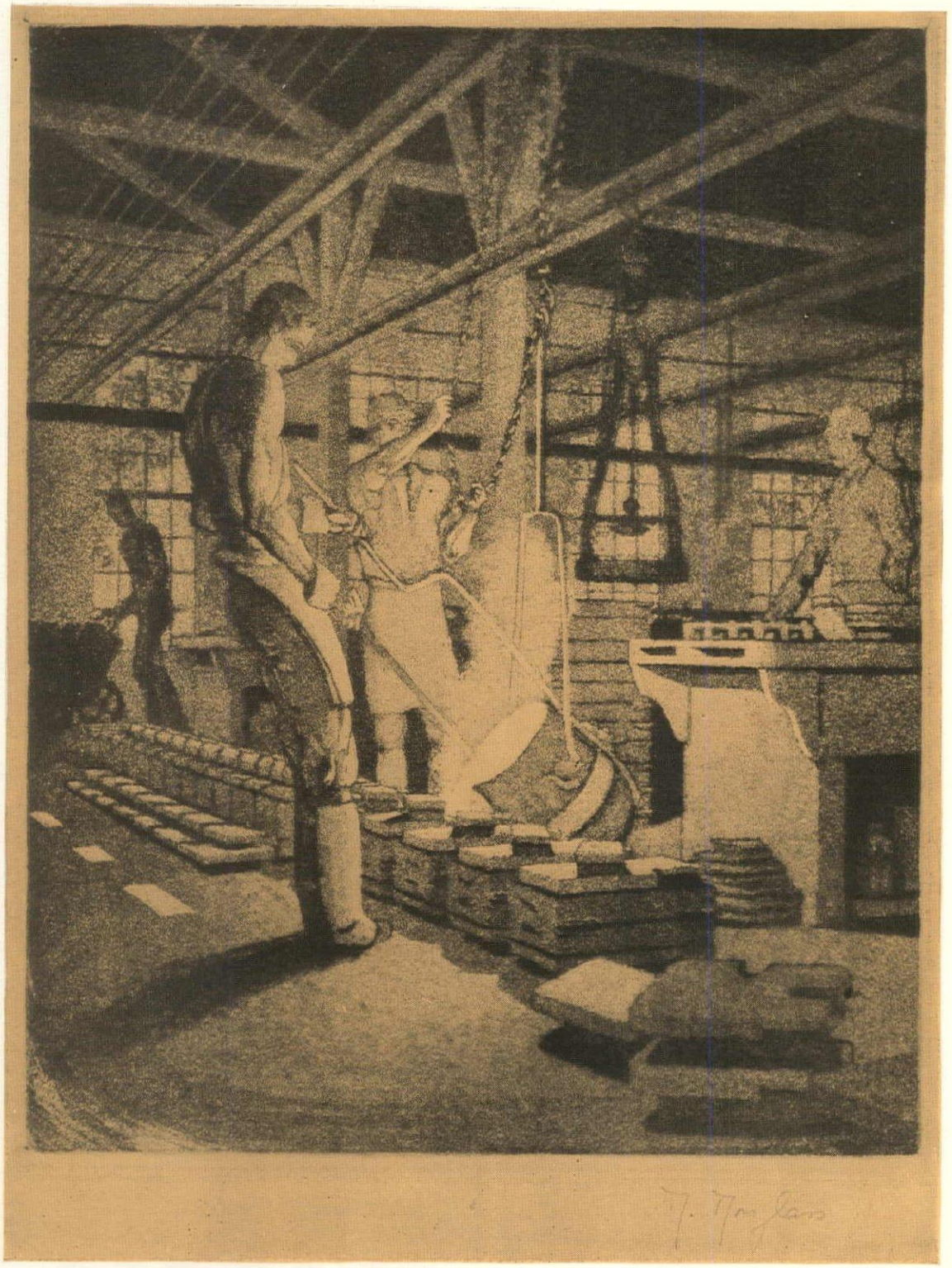
CLOW

CHICAGO

PREFERRED FOR EXACTING PLUMBING SINCE 1878

Consult your architect

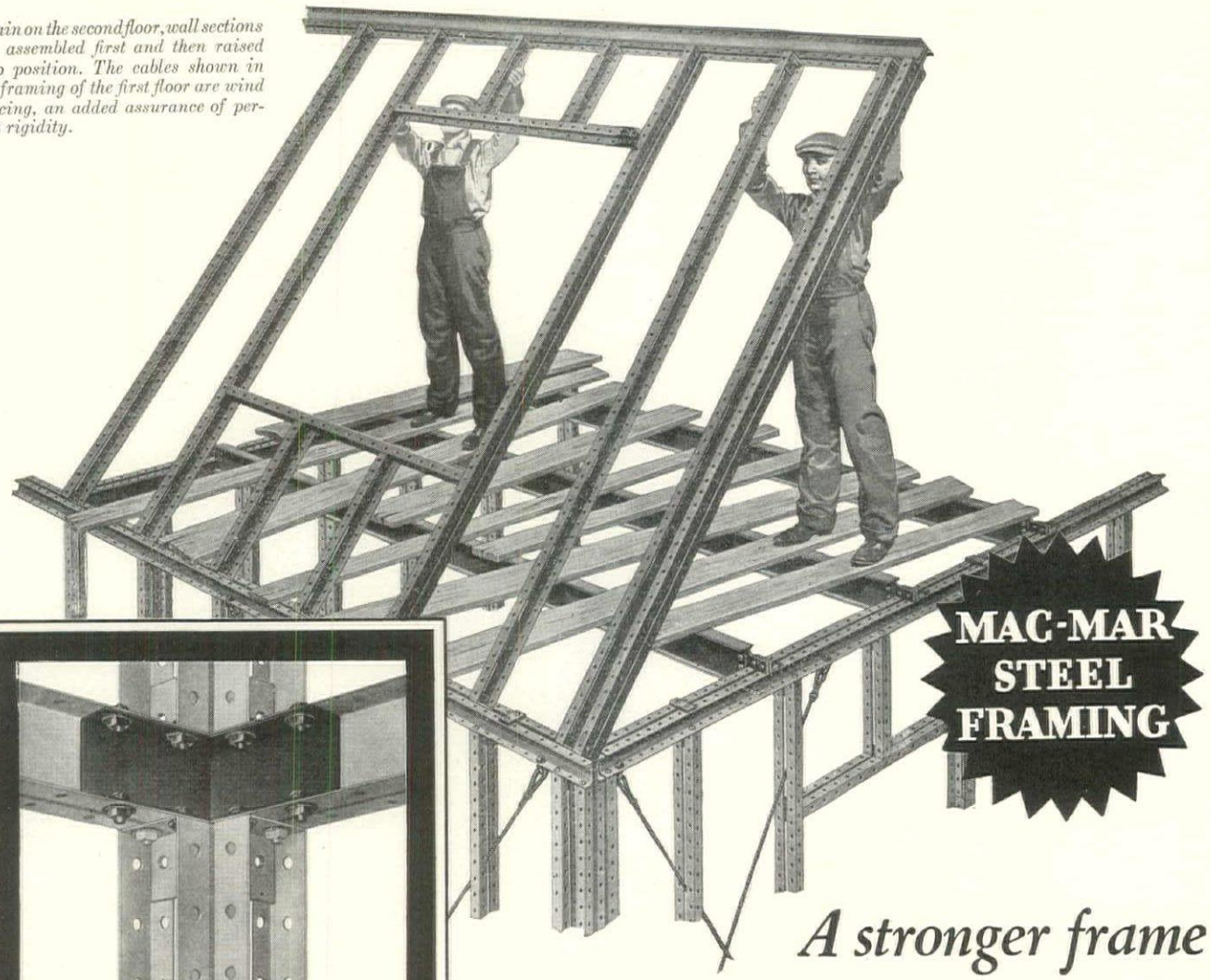
The Clow Soldier of Sanitation is a specialist on the acute problems of sanitation that confront every builder of a school, hospital, industrial plant or other public building. At his finger tips is the accrued experience of Clow's 52 years experience—at his back the complete line of fixtures to meet every mass plumbing need. Call him in. This is Frank O. Tinthoff, Peoria, Ill.—Southern Illinois Territory.



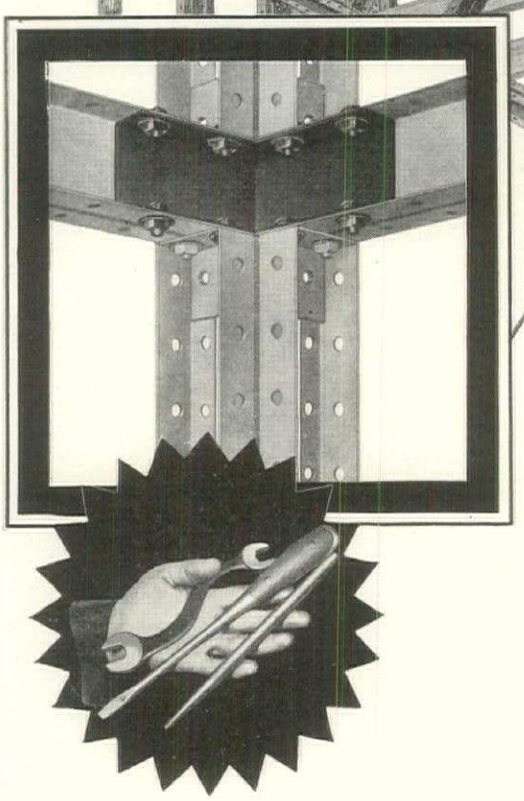
POURING BRONZE . . . FOR FLAWLESS CASTINGS

Scientific foundry practice bulwarks Jenkins Valves against the blows of hard service. Metal is poured at the proper temperature to assure castings free from imperfections . . . Jenkins Valves are manufactured throughout to provide long-term performance characterized by definitely low upkeep . . . Jenkins Bros., 80 White Street, New York; 524 Atlantic Avenue, Boston; 133 North 7th Street, Philadelphia; 646 Washington Boulevard, Chicago; 1121 North San Jacinto. Houston. Texas: Jenkins Bros.. Ltd.. Montreal. London.

Again on the second floor, wall sections are assembled first and then raised into position. The cables shown in the framing of the first floor are wind bracing, an added assurance of perfect rigidity.



MAC-MAR STEEL FRAMING



Above is a detail showing a corner of the sills of the second floor, a third stud behind the two visible, forms a strong 4 x 4 corner post. Note the rigidity of this construction, secured with the simple tools illustrated.

A stronger frame easier to erect . . . .

LOOK at the illustrations on this page. Notice the simplicity with which the joints of this copper-bearing steel framing are made secure. Look at the simple tools with which the framing can be erected quickly, easily. Remember that MacMar Steel Framing is fabricated to fit the plans exactly, and then think how erection is simplified by the elimination of cutting and trimming of framing materials on the job. These are some of the advantages of MacMar Steel Framing.

The house constructed of MacMar Steel Framing is *strong*. It is fire safe and lightning proof. And it will never shrink or warp, causing plaster cracks and ill-fitting doors or windows. It is warmer in winter, cooler in summer.

A set of blueprints sent to us will bring you promptly a quotation on MacMar Steel Framing. Prices quoted with or without erection. Write us for complete information.

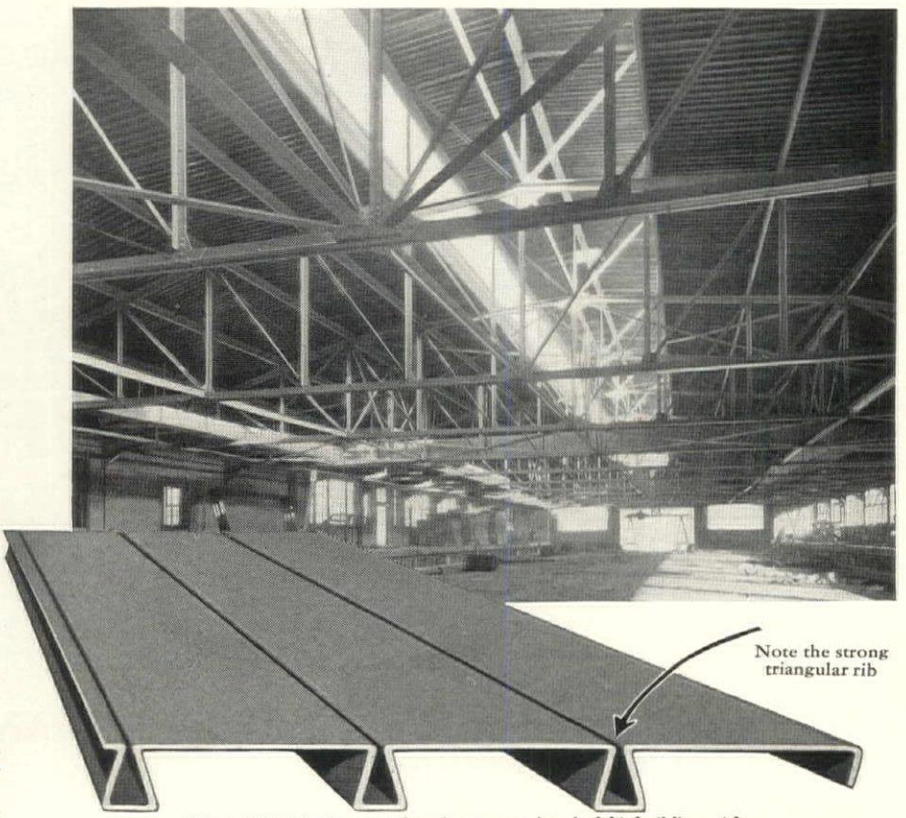
STEEL FRAME HOUSE COMPANY

Subsidiary of McClintic-Marshall Corporation

OLIVER BUILDING PITTSBURGH, PA.

ILLINOIS BELL TELEPHONE

SAVES STEEL with STEEL !



Illinois Bell Telephone saved on the structural steel of this building with a Fenestra Holorib Steel Roof Deck.

17-Point Holorib Roof Deck

1 A copper-bearing steel roof deck, combined with sufficient insulation to prevent condensation.

2 A long-lived roof, requiring a minimum of maintenance.

3 Its light weight reduces the requirements of the structural steel—(one square foot of Holorib weighs approximately 5 lbs., including insulation and waterproofing).

4 Carries required loads over wide purlin spacing with ample factors of safety.

5 Makes a firm, smooth and inherently dry mopping surface for the application of insulation and roofing felts. The affinity of its component parts gives it a much longer life than other roofs.

6 Quickly laid. Speeds the completion of the building.

7 May be laid in any weather men can work —nothing to pour—nothing to freeze—nothing to dry out.

8 Applicable to flat, pitched, saw-tooth, monitor, bowstring or curved surfaces.

9 Unaffected by atmospheric changes. Expansion and contraction are negligible.

10 Saves winter fuel. Provides cooler interiors in warm weather.

11 Saves insurance. Takes a fireproof rating when used over incombustible contents.

12 Telescoping end laps made over the purlins form tight interlocking joints.

13 Triangular reinforcing ribs running longitudinally in the sheet form a continuous beam that rests directly on the purlins.

14 May be welded in place forming a rigid yet self-adjusting foundation for insulation and waterproofing.

15 Lower in cost than any other types of fire-resistive roof of the same insulating efficiency.

16 Provides attractive ceilings. It is not a dust collector.

17 May be used as a highly satisfactory floor with or without concrete.

Fenestra Holorib Steel Roof Deck—plus insulation—plus waterproofing—weighs LESS than 5 pounds per square foot.

Copper-bearing steel sheets, reinforced by sturdy *triangular* ribs (see above), have an inherent strength which permits unusually wide purlin spacing and still maintains ample factors of safety.

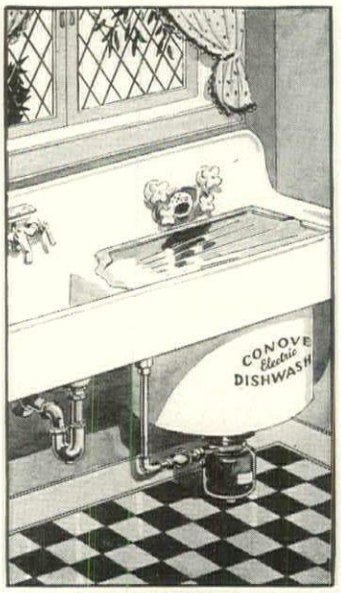
Figure for yourself what that may mean in the saving of structural steel. At the left, check seventeen distinct advantages which accrue to any insulated roof built on a Fenestra Holorib deck.

Fenestra Holorib is now a part of the Detroit Steel Products Company; sold through country-wide Fenestra Holorib representatives and backed by the oldest and largest steel window manufacturer in America. Immediate shipments are available. Engineering and designing service for the asking without obligation. Telephone the nearest Holorib or Fenestra representative or write for literature to:

Fenestra Holorib Division

DETROIT STEEL PRODUCTS COMPANY
2250 East Grand Boulevard Detroit, Michigan

Fenestra HOLORIB
ROOF DECKS FLOOR FORMS



Conover Sink Model

Ideal for SMALL KITCHENS and SMALL FAMILIES

No one can appreciate more than an architect how difficult it is to make small kitchens efficient, yet modern and attractive in appearance. Therefore no one will recognize more quickly than an architect the increased appeal of apartment hotels and small apartments that are equipped with the

CONOVER Electric DISHWASHER SINK

It washes — rinses — dries

Specially built models for small kitchens. The CONOVER requires no more floor space than same sized kitchen sink without the dishwasher feature. Large movable drainboard gives greater efficiency than average sink drainboard. Takes trap at ordinary height and is interchangeable with regular kitchen sink. Does away with unsightly pipes and allows plenty of room for under-sink radiators that are so essential in the modern small kitchen.

Young married couples and other tenants of small apartments who are obliged to be out a great deal are particularly impressed with the generous storage capacity of the CONOVER tank. Dirty dishes from several meals can be placed hastily out of the way and out of sight for once-a-day dishwashing at most convenient time,—*and the kitchen is always tidy*. Rubber plated dishracks insure quiet operation and avoid chipping of dishes; self cleansing; very simple to operate.

Endorsed by Authorities

Approved by Good Housekeeping Institute, Delineator Home Institute and thousands of satisfied users. Available in various sizes and models to meet practically every requirement, including models for tiling-in and for cabinet installation, with drainboards on right or left side, and in regular or acid-resisting enamel, in white, green and other popular colors.

CONOVER Sink Models are sold exclusively through Master Plumbers. CONOVER Portable Models are sold only through the Electrical trade.

Write for folder, "The Kitchen of Tomorrow."

THE CONOVER COMPANY

140 So. Dearborn Street, Chicago, Illinois

DISTRICT OFFICES: 101 Park Avenue (Architects' Bldg.), New York
1700 Walnut Street, Philadelphia; 115 Chauncy Street, Boston

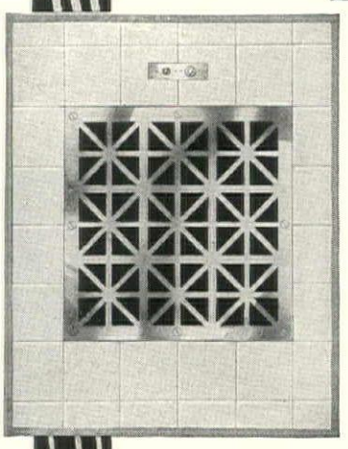
UNBROKEN BY THE SLEDGE-HAMMER BLOWS OF EXPERIENCE

Years ago the Spencer Heater Company discontinued commercial ratings and instituted in their stead Spencer Guaranteed Capacities. Every Spencer Heater is guaranteed to carry a definite amount of radiation. Ample allowance is made for losses from covered mains, risers and returns, and peak loads.

These capacities, determined in our laboratory, have been proved accurate by that most exacting test of all — Experience. It is significant that every Spencer has faithfully lived up to its guarantee, with never a failure to mar this perfect record. Spencer Heater Company, Williamsport, Pennsylvania.

SPENCER *Magazine Feed* **HEATERS** *for steam, vapor or hot water*

Every Room Needs an Electric Heater



LATE nights and early mornings, when the heat dies down—also in the Spring and Fall—what a blessing to be able to push a button and feel the glowing heat from a Prometheus Electric Heater!

No building is *modern* unless *every* room is equipped with a

PROMETHEUS Electric Heater

This heater is built into the wall and has an attractive grille of chrome or monel. Heating element is entirely enclosed. Easily installed. Approved by Underwriters.

Write for catalog.

PROMETHEUS ELECTRIC CORP.

358 West 13th Street New York, N. Y.

Little Points *make* *a* Big Difference

DIVERSITY OF EQUIPMENT

There are 21 standard types of Sedgwick Hand Power Dumb Waiters and Elevators.

PROMPT DELIVERY

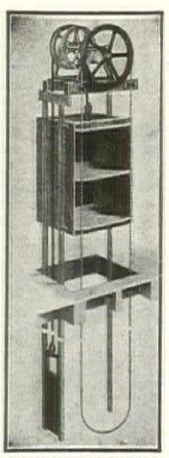
Shipment of standard equipment can be made upon receipt of order, special outfits in less than a week.

EXPERIENCED ADVISORY SERVICE

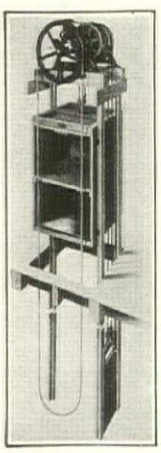
With 40 years of specialization in the design, manufacture and installation of hand power elevating equipment for all purposes, the Sedgwick Architectural Engineering Department is well qualified to submit advice.

UNDIVIDED RESPONSIBILITY

Recognized as the largest manufacturers of hand power dumb waiters and elevators exclusively, the name SEDGWICK is positive guarantee for satisfaction.



TYPE "FDCG" DUMB WAITER



SEDG-VERSAL DUMB WAITER

The "FDCG" Dumb Waiter illustrated above is suitable for average loads of 75 pounds or less. The Sedg-Versal Dumb Waiter is suitable for average loads up to 150 pounds. This information and additional data is now prepared in convenient folder form ready for your files. Write for new Architect's Reference Chart showing Application—Uses—Loads and Sizes of Dumb Waiters and Elevators, if your copy has not been received. Address Sedgwick Machine Works, 151 West 15th Street, New York, N. Y.

SEDGWICK
Dumb Waiters - Elevators
FOR ALL PURPOSES

SOUND SYSTEMS

are of great importance to the Architect.

The best time to provide for a sound system in structures built to accommodate education, treatment of the sick, travel and entertainment, is at the time the housing for the enterprise is being planned. We will gladly send the architect full information about Powerizer for his files or have an expert call and discuss any prospect in installation, either for a new building or for one now existing.

Complete Powerizer Sound Systems are installed and serviced by our authorized electragists everywhere. Powerizer is a perfectly balanced set of units comprising all equipment for pick-up, amplification and distribution. An attractive booklet about the uses of Sound Systems will be sent upon request.

The original of this reprinted advertisement appeared in the MAY issue of Modern Hospital.

RADIO RECEPTOR CO., INC.
106A Seventh Ave., New York City

Licensed by the Radio Corporation of America and Associated Companies (A.F. 9-30)

POWERIZER
SOUND SYSTEMS

SIKA* HAS DRIED UP THE MUSEUM

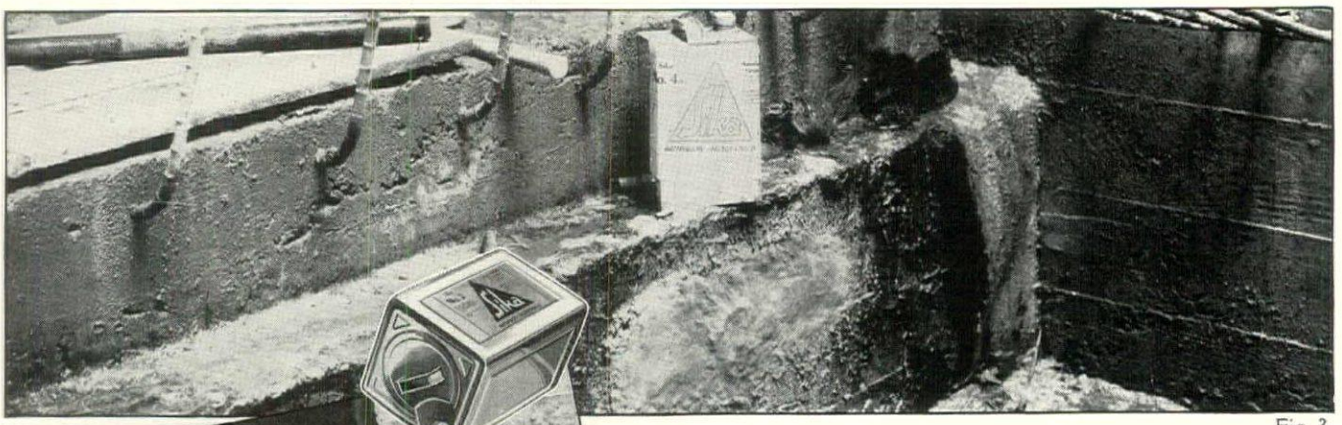


Fig. 3

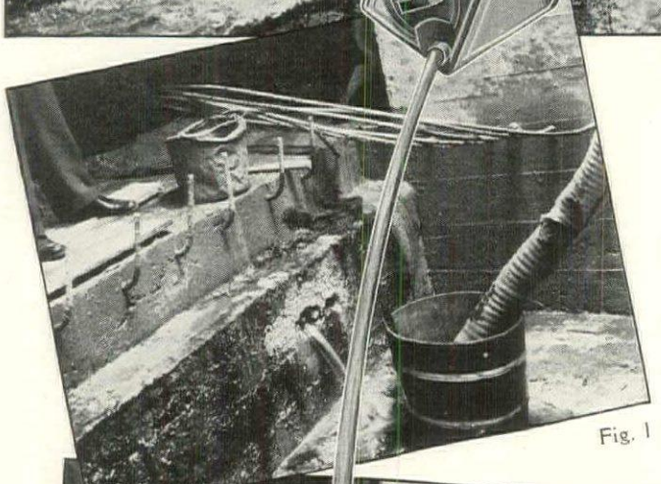


Fig. 1

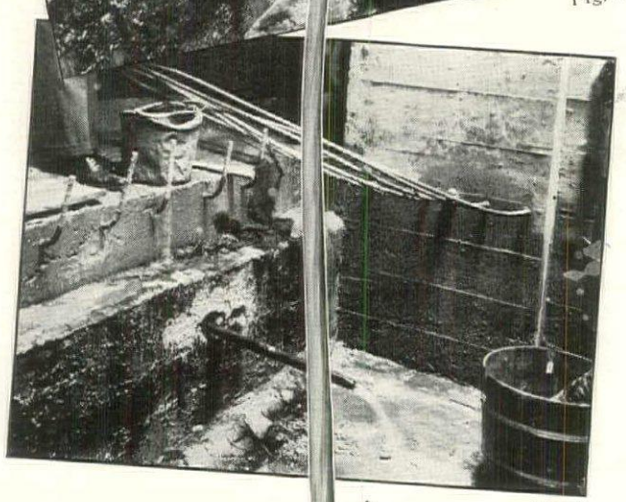


Fig. 2

FIVE feet of water stood in the concrete foundations of the Roosevelt Memorial Wing of the American Museum of Natural History in New York. As fast as it was pumped out, more water flowed in.

One application of Sika* stopped the leaks. This is how it was done:

THE leaks were local and each was treated separately. Portland cement concrete mixed with Sika* No. 4A (Moderately fast setting) was used to fill the cavities leaving a hole as shown in Fig. 1. A pipe was thrust into this hole as in Fig. 2 and neat cement mixed with Sika* No. 4A (moderately fast setting), filled in around it. The pipe was withdrawn, leaving a small hole through which ***all*** the water flowed. Then a small plug of neat Portland cement and Sika* No. 2 (instantaneous setting) was jammed into this small hole. In five seconds the water was stopped. See Fig. 3. It will never leak at those places again.

YOU should know about Sika*. It is easy to use. It is inexpensive. In twenty years of use it has never failed to waterproof, even where all other waterproofings have failed. Ask our nearest office for complete data.

**Pronounced See-ka; The Sanskrit word for "Dry."*

Sika

WATERPROOFS UNCONDITIONALLY

AMERICAN SIKA CORPORATION

56 WEST 45th STREET, NEW YORK

Sika Canada Limited
1198 University St.,
Montreal, P. Q., Canada

413 North State St.
Chicago, Illinois

Sika Canada Limited
513 Pacific Building
Vancouver, B. C., Canada

The architects of this building are Granger and Bollenbacher; the general contractor is Ralph Sollitt & Sons Construction Co., the electrical contractor is Bambula-Bach Electric Co.

By Far, the Cheapest in the End

In Chicago, the 1530 North State Parkway Apartments are being wired throughout with Hazard insulated wires and cables. The demonstrated economy of using materials of known reliability convinced the builders that Hazard Wire really is the cheapest in the end.

HAZARD INSULATED WIRE WORKS

Division of The Okonite Company

WORKS: WILKES-BARRE, PA.

NEW YORK	CHICAGO	PHILADELPHIA	PITTSBURGH	ST. LOUIS	BOSTON
ATLANTA	BIRMINGHAM	SAN FRANCISCO	LOS ANGELES	SEATTLE	DALLAS

SAVE ON YOUR MASONRY

BETTER masonry at less cost has made Brixment the world's largest-selling mason's cement:

[1] It costs less than the portland and lime required to make an equal amount of mortar.

[2] No soaking, no slaking. Ready to mix by hand or machine.

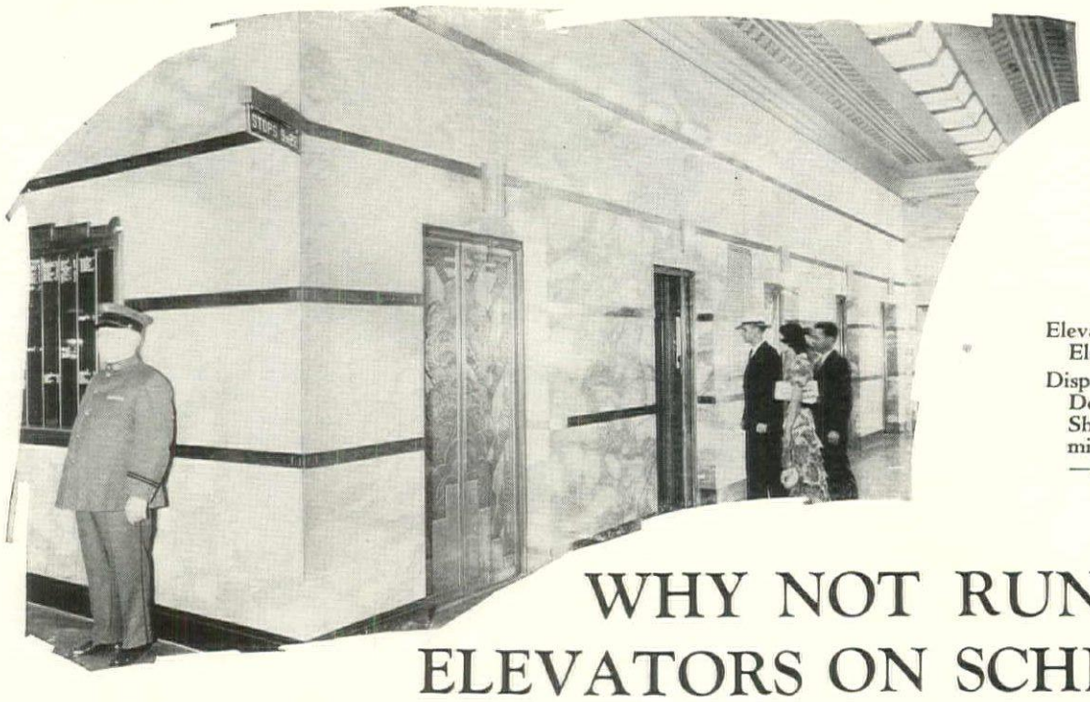
[3] Saves bricklayer's time because it's easier to spread and sticks to the headjoint; its unusual plasticity and convenient set help him in striking joints.

[4] Reduces labor in cleaning down the wall because it doesn't slop down over the face of the brick. Louisville Cement Co., Incorporated, Louisville, Kentucky.

CEMENT MANUFACTURERS SINCE 1830

BRIXMENT

for MASONRY and STUCCO

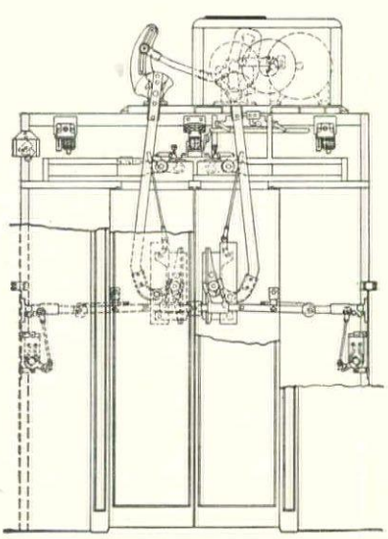


Elevator Foyer, Daily News Building, New York City

Architect—
Raymond M. Hood
Engineers—
Wyscoff & Pickworch
General Contractors—
Hegeman Harris Co., Inc.
Elevators—Westinghouse Electric Elevator Co.
Dispatching System; Electric Door Operators; Type B Sheave Hangers; Cast Aluminum Elevator Car Doors —Elevator Supplies Co.

WHY NOT RUN YOUR ELEVATORS ON SCHEDULE?

Dispatching Panel in the Daily News Building, New York City



"ES" Electric Door Operator in the Daily News Building

THERE'S nothing new in the application of systematic scheduling of transportation units. Railroads, surface cars, buses are run by the clock. And Elevators should be—they carry more passengers than any other system of transportation.

In spite of the fact that the most modern electric elevators were chosen for the new Daily News Building, in New York City, the architects and engineers were convinced that an automatic dispatching system would render most effective elevator service to these fast moving arteries of vertical traffic.

They studied the situation carefully with "ES" Engineers and installed an "ES" Automatic Dispatching System. Their fourteen cars operate at regular intervals giving fast, efficient service.

This service is greatly facilitated by "ES" Electric Door Operators, because of their ease of control, safety and smooth action.

Improved elevator service in old buildings is almost invariably possible. A scheduling system and automatically operated doors may be your solution. But whatever it is, "ES" can help you find it. There is no obligation incurred by calling on "ES" for a survey of your conditions. Our nearest branch office is at your service.

"ES" Equipment in the Daily News Building, New York City, includes:

Electric Elevator Door Operators
Type "B" Sheave Hangers
Dispatching System
Cast Aluminum Elevator Car Doors

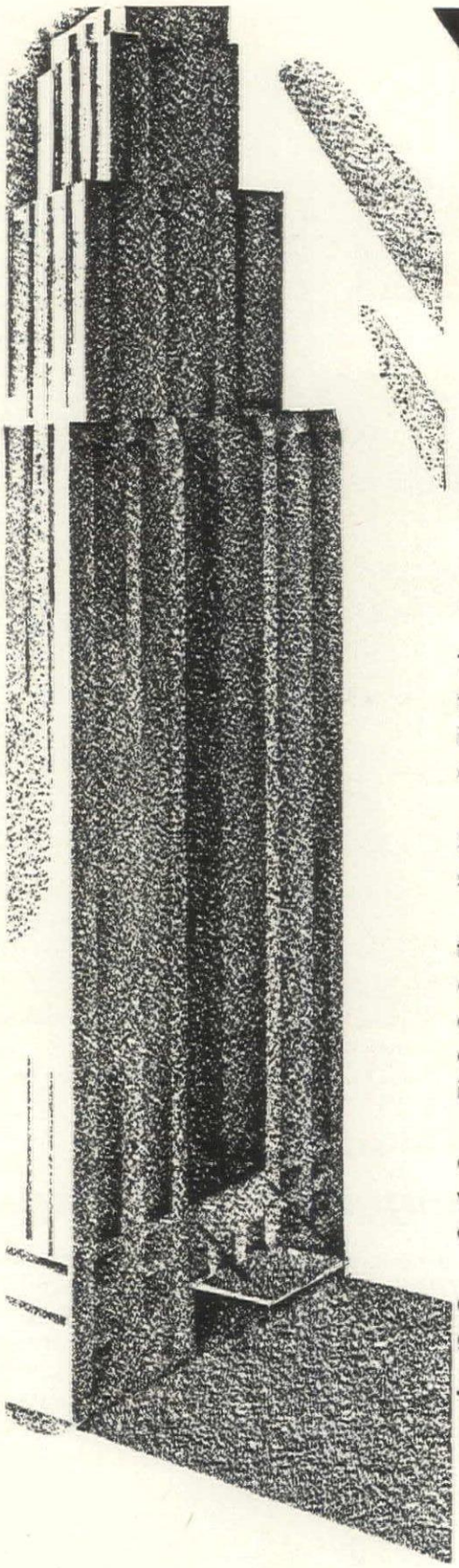
ES

PRODUCTS

ELEVATOR SUPPLIES COMPANY, Inc.

MAIN OFFICE AND WORKS
HOBOKEN, N. J.

Boston Chicago Cincinnati Cleveland Detroit Los Angeles Dallas Pittsburgh Philadelphia San Francisco



YOUR BUILDING TEN YEARS FROM NOW . . .

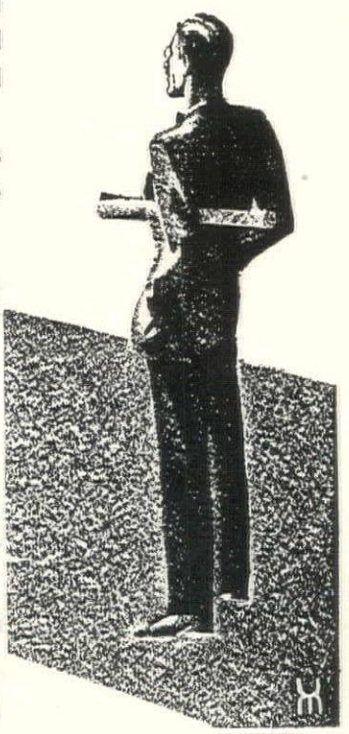
Ten years from now the outside will look the same, you say—but how about the inside? How about the rents, and the cleaning service costs?

These are questions which the Spencer Central Cleaning System answers in a profitable way.

Even before the building is opened this System begins a lifetime of efficient cleaning work. It removes all dirt and dust the day it arrives. It cuts the costs of cleaning and keeps all parts of the building clean and serviceable every day.

Bare floors and concrete, linoleum and rugs—any surface is quickly cleaned with quick strokes of the light and efficient vacuum tools.

If you do not have our *special* series of Bulletins for Architects we will be glad to send you a set for your files.



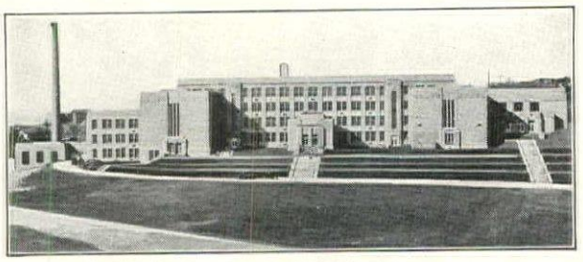
THE SPENCER TURBINE COMPANY
Hartford, Connecticut

SPENCER CENTRAL CLEANING SYSTEM

4604

The New HAVEMEYER STEEL JOIST

Upper—THE BIARRITZ, Atlantic City, N. J., Louis Joseph Tonk, Architect, Herbert V. Realty Company, Builders.

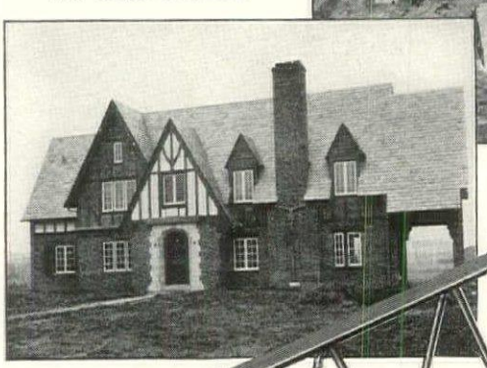


HERRON HILL HIGH SCHOOL, Pittsburgh, Pa.
James Steen & Sons, Architects.

Upper—MARTIN BUILDING, Elizabeth, N. J., Frank A. Berry, Architect, John W. Ferguson Company, Builders.

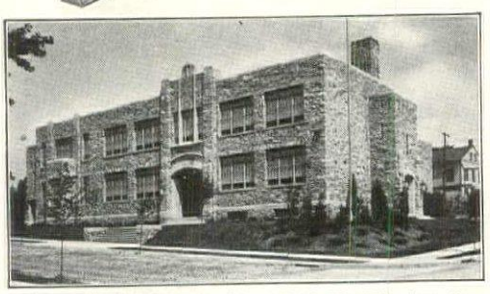
Lower—TRINITY REFORMED CHURCH, Akron, Ohio, J. C. Fulton & Sons, Architects. C. W. & P. Construction Co., Contractors.

Lower—RESIDENCE, Akron, Ohio, J. F. Suppes, Architect, Wm. Koegel, Contractor.



Centre Illustration—ROCKLAND COUNTY STATE HOSPITAL, Orangeburg, New York, State of New York, Sullivan W. Jones, Architect, W. E. Haugaard, Successor. Niewenhous Co., Inc., Contractors.
Photo by Fairchild Aerial Surveys, Inc.

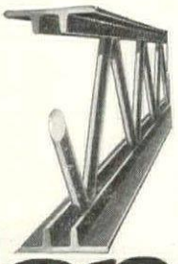
for all types of light-occupancy buildings



SACRED HEART PARISH SCHOOL, West Reading, Pa., Jacoby & Everett, Allentown, Pa., Architect, Wyomissing Development Co., Wyomissing, Pa., Contractor.

Combining fire safety with minimum weight and simplified installation, the New HAVEMEYER Steel Joist meets a need long-recognized in the construction of fireproof floors and roofs for all types of light-occupancy buildings . . . For Schools, Hospitals, Sanitariums, Churches, Apartment houses, Hotels, Residences, etc., the HAVEMEYER Steel Joist is ideal. Its use is recommended wherever the utmost in economy, fire-safety and speed of erection are imperative.

Write for new booklet "Havemeyer Steel Joist."



The new HAVEMEYER Steel Joist is made with a specially rolled "Twin-tee" steel section for top and bottom chords. The chords provide a flat bearing surface which adds materially to the lateral stiffness of the joist and simplifies the placing of lath for the finished floor or ceiling. Altogether the HAVEMEYER Steel Joist is a rigid electrically welded unit capable of the utmost strength proportionate to its weight.

Concrete Steel Co.

Concrete Steel Co.

2 PARK AVENUE · · NEW YORK CITY

Times Wide World Photos

Shamrock V

. . . greatest of an illustrious line of racing sailcraft

WHEN the SHAMROCK V slid gracefully down the ways, in Southampton, England, one of the greatest racing sailcraft of all time was born to the world . . . a contender worthy of the name.

In these costly craft materials of construction are all-important, along with balanced design. Seventeen hundred pounds of blue annealed Armco INGOT IRON was used in the centreboard casing to oppose the menace of salt corrosion in this vital part of the SHAMROCK'S hull.

The famous trophy which the Shamrock V will attempt to win back in the international race for sailing craft.

THE AMERICAN ROLLING MILL COMPANY
Executive Offices, Middletown, Ohio
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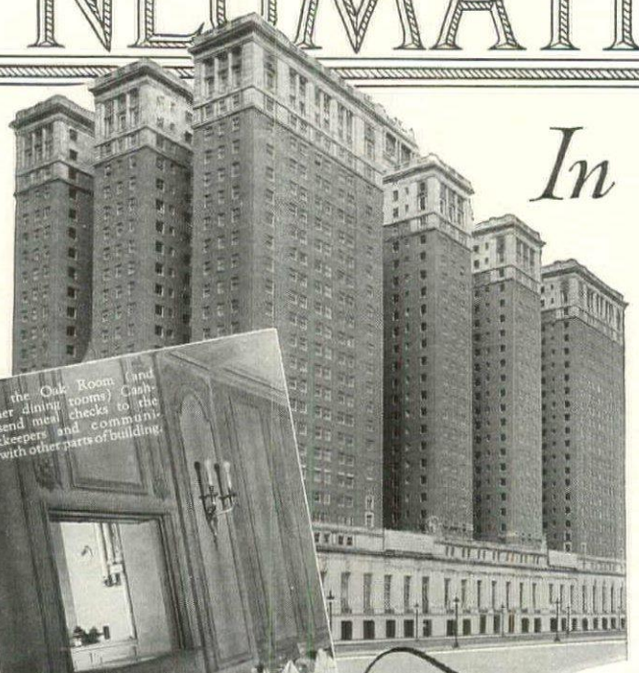
ARMCO

"BE SURE IT'S MADE OF ARMCO INGOT IRON"

PNEUMATIC TUBES

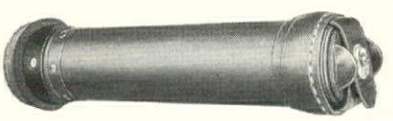


In a Great Hotel

THE STEVENS

CHICAGO, ILLINOIS

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



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

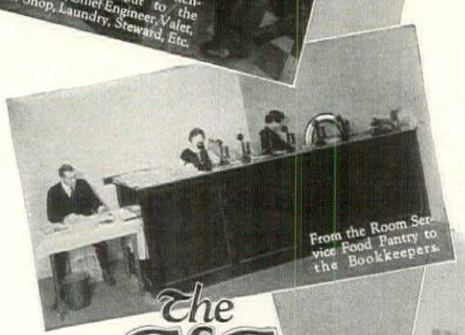
Guests are registering and checking out in a continual procession. Meals are served and charged. Telephone calls, valet service and laundry charges must be transferred to guest accounts *immediately*. Hotel executives, department chiefs and floor clerks must be linked together for the exchange of written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

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

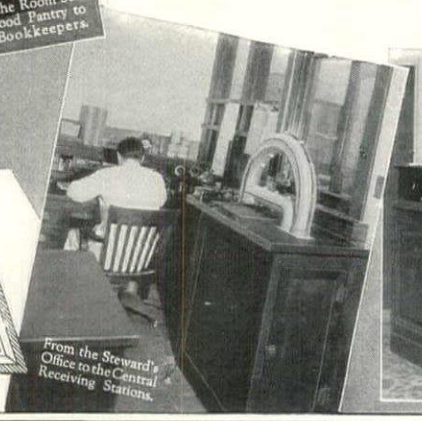
Catalog in Sweet's Arch't. Cat., 1930 *Ed. pp. D*5113-15
Catalog in Specification Data, 1930 *Ed. pp.* 232-233

G&G ATLAS SYSTEMS, Inc.

544 West Broadway New York
407 Dominion Bank Bldg., Toronto



The G&G ATLAS PNEUMATIC TUBE SYSTEM
REG. U.S. PAT. OFF.



Critical Builders choose G-E WIRING SYSTEM

501 Madison Ave. Building
New York, N. Y.

General Builder
Gresham Construction Co.

Architects
Robert D. Kohn
Frank E. Vitolo

Electrical Engineer
Eadie, Freund & Campbell

Electrical Contractor
Fischback & Moore, Inc.

All of New York City

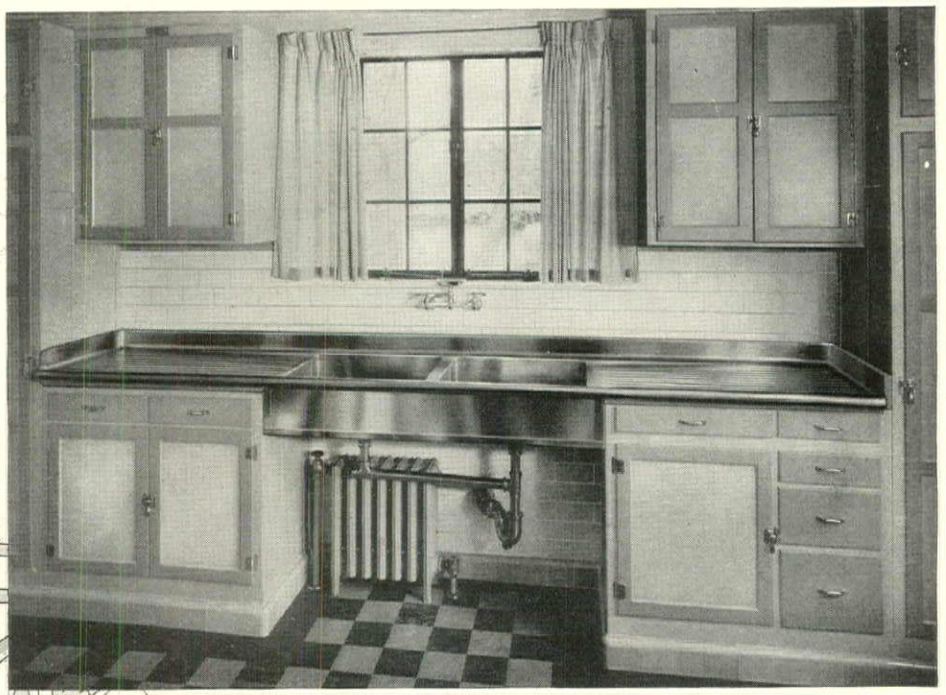
It's new, modern as today's newspaper...but 501 Madison Avenue Building is no lavish product of a construction boom. Critical, hard-headed discrimination went into the selection of design, materials, equipment. And General Electric Wiring System was chosen!

It is chosen every day by architects, builders, contractors everywhere because it helps attract and hold good tenants by providing *complete* electric service . . . because its high-grade materials assure owners that wiring will be free from trouble and expense; that it will add definite property value.

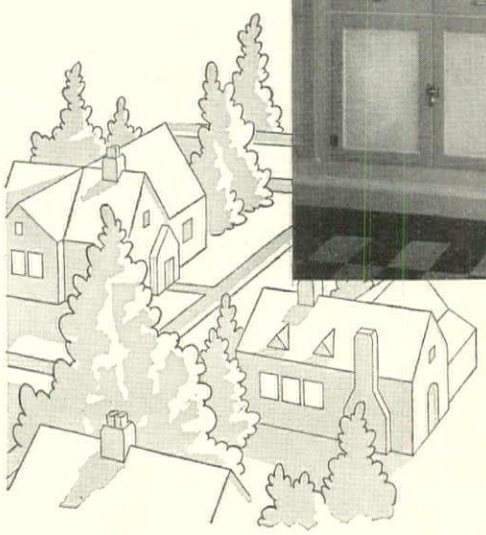
The General Electric Wiring System is soundly economical for *any* type of building—tiny cottage or giant tower of commerce.

GENERAL ELECTRIC WIRING SYSTEM

MERCHANDISE DEPARTMENT · GENERAL ELECTRIC COMPANY · BRIDGEPORT, CONNECTICUT



Kitchen sink of heavy gauge Monel Metal manufactured by Smith & Mossi Corp., New York and installed in a Douglaston, L.I. residence.



Built for kitchen duty . . . *this lifetime sink of* MONEL METAL

THE custom-made Monel Metal sink illustrated is a splendid example of the advantages of this silvery Nickel alloy in kitchen sink construction. With its washing and rinsing bowls, its corrugated drain-boards, all of satin finish, heavy gauge Monel Metal, it represents the utmost in sink attractiveness, convenience and durability.

Heavy gauge Monel Metal is customarily specified for kitchen sinks because it combines modern beauty and ready cleanability with rugged wear-resistance. Strong as steel, with no coating to chip or wear off, it resists the denting and abrasion encountered in hard kitchen service. It can never rust—and it defies the corrosive attacks of food juices and cleaning compounds. A Monel Metal sink can be kept spick and span with minimum cleaning effort.

Because its crisp, silvery beauty is so perfectly in keeping with modern trends in kitchen design and appointment, leading architects are now specifying heavy gauge, satin finish Monel Metal kitchen sinks for many of the finest residences they plan. Let us send you complete information on household uses for Monel Metal.

Write for New Booklet, "Planning the Modern Kitchen".

INCo MONEL METAL TRADE MARK

Monel Metal is a registered trade mark applied to a technically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

MONEL METAL

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

Selected List of Manufacturers' Publications

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, DECORATORS, AND CONTRACTORS

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

ACOUSTICS

R. Guastavino Co., 40 Court Street, Boston.
Akoustolith Plaster. Brochure, 6 pp., 8½ x 11 ins. Akoustolith as Related to Architectural Acoustics. Booklet 10 pp., 8½ x 11 ins.

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

ASH HOISTS

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

ASH HOISTS—TELESCOPIC

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

BRICK

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

CABINET WORK

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

CARPETS

Collins & Aikman Corporation, 25 Madison Avenue, New York.
"Seemingly Seamless Carpets." Booklet, 8 pp., 8½ x 11 ins. Illustrated.

CEMENT

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

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.

Medusa Portland Cement Co., 1002 Engineers' Building, Cleveland.
Medusa Waterproofed Gray Portland Cement. Booklet, 30 pp., 8½ x 11 ins. Illustrated.
Medusa White Portland Cement, Non-Staining. Brochure, 30 pp., 8½ x 11 ins. Illustrated.

Portland Cement Association, Chicago, Ill.
Concrete Masonry Construction. Booklet, 48 pp., 8½ x 11 ins. Illustrated. Deals with various forms of construction.
Town and Country Houses of Concrete Masonry. Booklet, 20 pp., 8½ x 11 ins. Illustrated.
Facts About Concrete Building Tile. Brochure, 16 pp., 8½ x 11 ins. Illustrated.
The Key to Firesafe Homes. Booklet, 20 pp., 8½ x 11 ins. Illustrated.
Design and Control of Concrete Mixers. Brochure, 32 pp., 8½ x 11 ins. Illustrated.
Portland Cement Stucco. Booklet, 64 pp., 8½ x 11 ins. Illustrated.
Concrete in Architecture. Bound Volume, 60 pp., 8½ x 11 ins. Illustrated. An excellent work, giving views of exteriors and interiors.

CENTRAL CLEANING SYSTEMS

The Spencer Turbine Co., Hartford, Conn.
Modern Cleaning Methods for Hotels, Schools, Theatres and Industry.

CHURCH EQUIPMENT

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

CLUB EQUIPMENT

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

CONCRETE BUILDING MATERIALS

Concrete Steel Company, 2 Park Avenue, New York, N. Y.
Modern Concrete Reinforcement. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

CONSTRUCTION, FIREPROOF

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.

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

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

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

DOORS

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

DOORS AND TRIM, METAL

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

William Bayley Co., 147 North Street, Springfield, Ohio.
Bayley Tubular Steel Doors. Brochure, 16 pp., 8½ x 11 ins. Illustrated.

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

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

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

DOORS, SOUNDPROOF

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

DRAINAGE FITTINGS

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

REQUEST FOR CATALOGS

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

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Name .....Business .....

Address .....

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 175*

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

The Electric Storage Battery Co., Philadelphia.
Emergency Lighting and Emergency Power Data. Booklet. 12 pp., 8½ x 11 ins. Illustrated.

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

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

Ward Leonard Electric Co., Mt. Vernon, N. Y.
Mobile Color Lighting. Booklet, 46 pp., 8½ x 11 ins. Illustrated. Valuable work on the subject.

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

ELEVATORS

Otis Elevator Company, 260 Eleventh Ave., New York, N. Y.
Otis Push Button Controlled Elevators. Descriptive leaflets, 8½ x 11 ins. Illustrated. Full details of machines, motors and controllers for these types.
Otis Geared and Gearless Traction. Elevators of All Types. Descriptive leaflets, 8½ x 11 ins. Illustrated. Full details of machines, motors and controllers for these types.
Escalators. Booklet, 8½ x 11 ins., 22 pp. Illustrated. Describes use of escalators in subways, department stores, theaters and industrial buildings. Also includes elevators and dock elevators.

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

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

ESCALATORS

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

FIREPROOFING

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

FIREPROOFING—Continued

Concrete Steel Company, 2 Park Avenue, New York, N. Y.
Economical Fireproof Floors for Suburban Buildings. Folder. 4 pp., 8½ x 11 ins. Illustrated.
Havemeyer Steel Joist. The Joist with the Twin-Tee Chords. Booklet, 24 pp., 8½ x 11 ins. Illustrated.

National Fireproofing Company, Fulton Building, Pittsburgh.
Natco; The Complete Line of Structural Clay Tile. Booklet. 48 pp., 8½ x 11 ins. Illustrated.
Make the Facing Bear Its Share. Folder, 8½ x 11 ins. Illustrated.
Unibacker, The Tile That Binds. Folder, 8½ x 11 ins. Illustrated.
Face Tile Walls. Folder, 8½ x 11 ins. Illustrated.
Meeting Every Need. Folder, 8½ x 11 ins. Illustrated.
Natco Vitritile. Folder, 8½ x 11 ins. Illustrated.
Natco Double Shell Load Bearing Tile. Folder, 8½ x 11 ins. Illustrated.

FLOODLIGHTING

National Terra Cotta Society, 230 Park Avenue, New York, N. Y.
Terra Cotta Buildings Are Superior for Floodlighting. Brochure, 16 pp., 8½ x 11 ins. Illustrated.

FLOOR HARDENERS (CHEMICAL)

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

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

FLOORS—STRUCTURAL

Concrete Steel Company, 2 Park Avenue, New York, N. Y.
Havemeyer Steel Joist. The Joist with the Twin-Tee Chords. Booklet, 24 pp., 8½ x 11 ins. Illustrated.

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

Structural Gypsum Corporation, Linden, N. J.
Gypsteel Pre-cast Fireproof Floors. Booklet, 36 pp., 8½ x 11 ins. Illustrated. Data on flooring.
Service Sheet No. 3. Specifications and Details of Design and Construction for Gypsteel Pre-Cast Floors and Ceilings. Folder, 8½ x 11 ins. Illustrated.

FLOORING

Armstrong Cork Co. (Flooring 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-Sandura Company, Inc., Finance Building, Philadelphia.
Blabon's Linoleum Styles for 1930. Booklet, 64 pp., 6¼ x 8½ ins. Illustrated.
Detailed Instructions for Handling and Laying Linoleum. Brochure, 40 pp., 3¼ x 5¾ ins. Illustrated.
Blabon's Linoleum Floors and Where You Will Find Them. Booklet, 8 pp., 8½ x 11 ins. Illustrated.
Comparison of Tests. Folder, 8½ x 11 ins. Illustrated.

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

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

REQUEST FOR CATALOGS

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

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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 176*

FLOORING—Continued

Goodyear Tire & Rubber Co., Inc., Akron, Ohio.
Beautiful Floors, Architects' Reference Book. Brochure, 32 pp., 8½ x 11 ins. Illustrated. Valuable data on flooring.
Rubber Flooring News Monthly publications. 8½ x 11 ins. Illustrated. Giving data on flooring for buildings of many types.
Manual of Goodyear Rubber Tile Installation Booklet. 7¾ x 10¾ ins. Illustrated.

C. Pardee Works, 101 Park Ave., New York, N. Y., and 1600 Walnut St., Philadelphia, Pa.
Pardee Tiles. Bound Volume, 48 pp., 8½ x 11 ins. Illustrated.

Stedman Rubber Flooring Company, South Braintree, Mass.
Stedman Ray-Proof Rubber. Booklet, 12 pp., 5½ x 8 ins. Illustrated. For X-ray Rooms.
Stedman Tile, The Original Reinforced Rubber Floor. Booklet, 16 pp., 8½ x 11 ins. Illustrated. Valuable data on flooring.

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

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.

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., 5⅞ 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.

GYPSUM

Structural Gypsum Corporation, Linden, N. J.
Service Sheet No. 1. Specifications and Details of Design and Construction for Gypsteel Pre-Cast Long-Span Roofs. Folder, 8½ x 11 ins. Illustrated. Service Sheet No. 2. Specifications and Details of Design and Construction for Gypsteel Pre-Case Short-Span Roofs. Folder, 8½ x 11 ins. Illustrated.

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.

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.

HARDWARE—Continued

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.

Todhunter, Inc., 119 East 57th St., New York, N. Y.
Colonial Hardware. Booklet. 12 pp., 8½ x 11 ins. Illustrated. Deals with hardware of the best type for exterior and interior use.

HEATING EQUIPMENT

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

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

Bryant Heater & Mfg. Co., 17825 St. Clair Ave., Cleveland, Ohio.
Handbook on Heating Buildings with Bryant Gas Furnaces. Booklet, 12 pp., 8½ x 11 ins. Illustrated.
Handbook on Heating Water with Bryant Gas Boilers. Brochure, 20 pp., 8½ x 11 ins. Illustrated.
Handbook on Heating Buildings with Bryant Gas Boilers. Booklet, 20 pp., 8½ x 11 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.

Grinnell Company, Providence, R. I.
Grinnell Discovers a Superior Heating Trap. Folder, 4 pp., 8½ x 11 ins. Illustrated.

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 7¼ 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."

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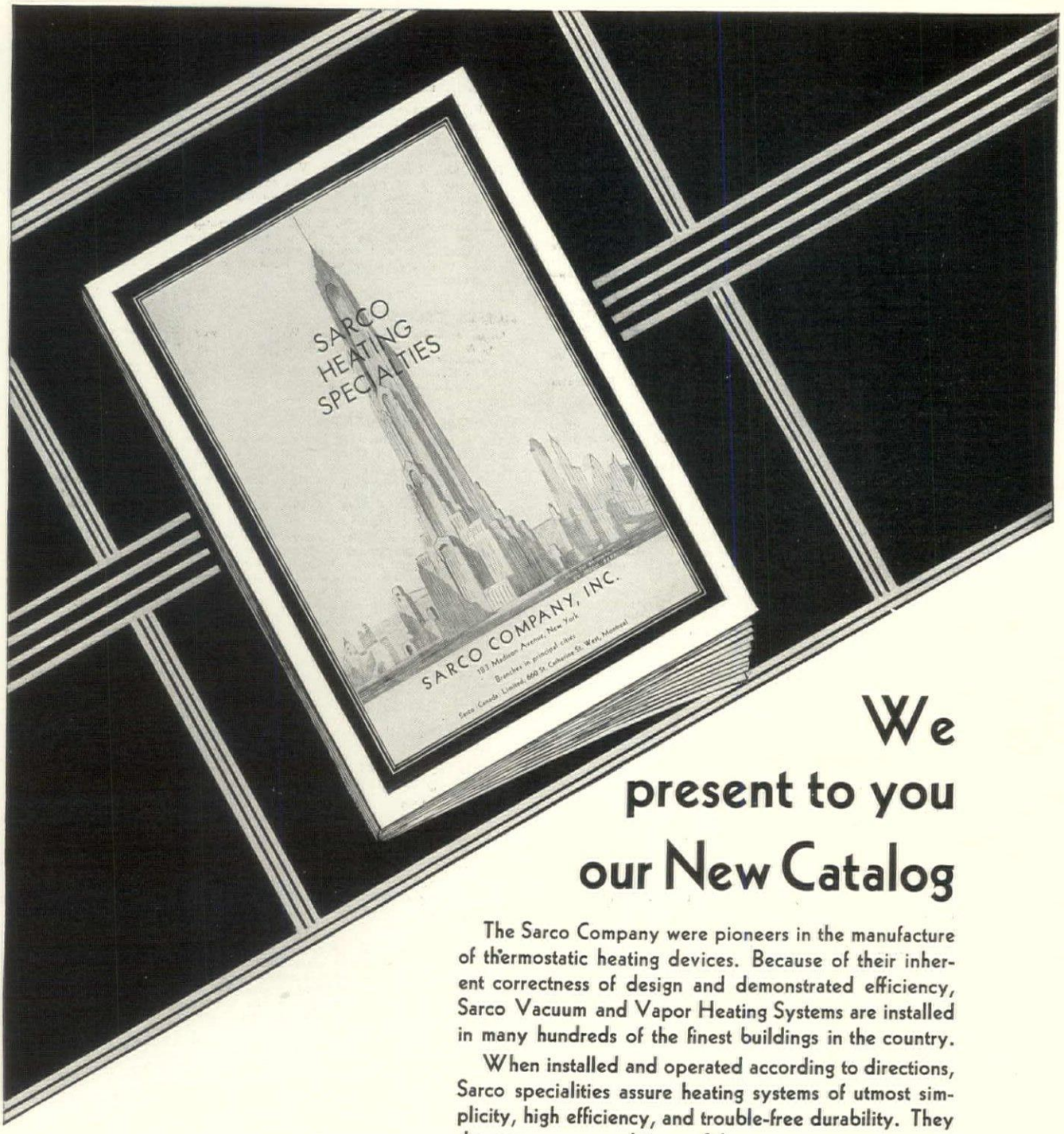

We present to you our New Catalog

The Sarco Company were pioneers in the manufacture of thermostatic heating devices. Because of their inherent correctness of design and demonstrated efficiency, Sarco Vacuum and Vapor Heating Systems are installed in many hundreds of the finest buildings in the country.

When installed and operated according to directions, Sarco specialities assure heating systems of utmost simplicity, high efficiency, and trouble-free durability. They deserve your complete confidence.

Our new catalog illustrates and describes Sarco Radiator Traps, Packless Inlet Valves, Packless Radiator Valves, Air Eliminators, Alternating Receivers, Combination Float and Thermostatic Traps, Strainers and Temperature Regulators. It also shows diagrams of typical vacuum heating systems.

Any architect, engineer or contractor can obtain a copy of this interesting catalog 40-AK on request, without obligation.

SARCO RADIATOR TRAP
BUILT TO A QUALITY STANDARD

SARCO COMPANY, INC.

183 Madison Avenue New York, N. Y.

BRANCHES IN PRINCIPAL CITIES
Sarco (Canada) Limited, 660 St. Catherine St., W., Montreal

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 178*

HEATING EQUIPMENT—Continued

S. T. Johnson Co., Oakland, Calif.
Johnson Oil Burners. Booklet, 9 pp., 8½ x 11 ins. Illustrated.
Bulletin No. 4A. Brochure, 8 pp., 8½ x 11 ins. Illustrated. Data on different kinds of oil-burning apparatus.
Bulletin No. 31. Brochure, 8 pp., 8½ x 11 ins. Illustrated. Deals with Johnson Rotary Burner with Full Automatic Control.

Kewanee Boiler Corporation, Kewanee, Ill.
Kewanee on the Job. Catalog, 8½ x 11 ins., 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators. etc.
Catalog No. 78, 6 x 9 ins. Illustrated. Describes Kewanee Firebox Boilers with specifications and setting plans.
Catalog No. 79, 6 x 9 ins. Illustrated. Describes Kewanee power boilers and smokeless tubular boilers with specifications.

McQuay Radiator Corporation, 35 East Wacker Drive, Chicago, Ill.
McQuay Visible Type Cabinet Heater. Booklet, 4 pp., 8½ x 11 ins. Illustrated. Cabinets and radiators adaptable to decorative schemes.
McQuay Concealed Radiators. Brochure, 4 pp., 8½ x 11 ins. Illustrated.
McQuay Unit Heater. Booklet, 8 pp., 8½ x 11 ins. Illustrated. Gives specifications and radiator capacities.

Modine Mfg. Co., Racine, Wisc.
Modine Copper Radiation. Booklet, 28 pp. 8½ x 11 ins. Illustrated. Deals with industrial, commercial and domestic heating.
A Few Short Years. Folder. 4 pp. 8½ x 11 ins. Illustrated. Heating for garages.
Dairy Plant Heating. Folder. 4 pp., 8½ x 11 ins. Illustrated.
Industrial Heating. Folder. 4 pp., 8½ x 11 ins. Illustrated.
Modine Unit Heater. Folder. 6 pp., 8½ x 11 ins. Illustrated.

Nash Engineering Company, South Norwalk, Conn.
Bulletin 85. Booklet. 12 pp. 10¾ x 7½ ins. Illustrated in color. Describes construction and operation of the Jennings Return Line Vacuum Heating Pump.
Bulletin 87. Brochure. 8 pp. 10¾ x 7½ ins. Illustrated in color. Deals with Sizes T and U Jennings Vacuum Heating Pump for 2500 and 5000 square feet equivalent direct radiation.
Bulletin 63. Booklet. 4 pp. 10¾ x 7½ ins. Illustrated. Describes in detail the Unit Type Motor Driven Jennings Condensation Pump.

National Radiator Corporation, Johnstown, Pa.
The Crimson Flame. Folder, 6 pp., 4½ x 7 ins. Illustrated.
Contento Brings Contentment to Your Home. Folder, 12 pp., 3½ x 6 ins. Illustrated.
National Jacketed Boiler. Folder. 4 pp., 8½ x 11 ins. Illustrated.
National Super-Smokeless Boiler. Folder, 4 pp., 8½ x 11 ins. Illustrated.
Aero, the National Radiator Sizes and Ratings. Booklet, 16 pp., 5 x 7⅞ ins. Illustrated.

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

Rome Brass Radiator Corporation, 1 East 42nd Street, New York.
Proof of the Pudding. Booklet, 24 pp., 8½ x 10½ ins. Illustrated. Describes Robras, 20-20 concealed-within-the-walls, lightweight, all-brass radiators.
Within the Walls. Brochure, 16 pp., 4 x 9 ins. Illustrated. Gives facts regarding modern, out-of-sight, lightweight, Robras 20-20 radiators.
Engineering Data. Booklet, 16 pp., 8½ x 10½ ins. Illustrated. Full data and tables to facilitate selection and installation of Robras 20-20 concealed radiators for steam, water and vapor heating systems.
Small Bathrooms Made More Spacious, Brochure, 4 pp. Illustrated. Gives descriptions, sizes and prices of Robras lightweight cabinet radiators to be installed under wash basins.

Rome Brass Radiator Corp., (Aul-Brass Heater Division) 1 East 42nd St., New York.
Aulbras Hot Water Heaters. Booklet, 12 pp., 8½ x 11 ins. Illustrated in color.

Sarco Company, Inc., 183 Madison Ave., New York City, N. Y.
Steam Heating Specialties. Booklet, 6 pp., 6 x 9 ins. Illustrated. Data on Sarco Packless Supply Valves and Radiator Traps for vacuum and vapor heating systems.
Equipment Steam Traps and Temperature Regulations. Booklet, 6 pp., 6 x 9 ins. Illustrated. Deals with Sarco Steam Traps for hospital, laundry and kitchen fixtures and the Sarco Self-contained Temperature Regulation for hot water service tanks.

Spencer Heater Co., Williamsport, Pa.
Catalog. Booklet, 20 pp., 6⅛ x 9 ins. Illustrated. Complete line of magazine feed cast iron sectional and steel tubular heaters.
Spencer Magazine Heaters, for Steam, Vapor or Hot Water. Brochure, 28 pp., 5¼ x 9 ins. Illustrated.
The Fire that Burns Uphill. Brochure, 24 pp., 6⅛ x 9¼ ins. Illustrated in color. Magazine feed heaters for steam, vapor and hot water heating.

HEATING EQUIPMENT—Continued

B. F. Sturtevant Company, Hyde Park, Boston, Mass.
Tempervane Heating Units. Catalog 363. Booklet, 44 pp., 8½ x 11 ins. Illustrated. Data on "Heating Every Corner with Maximum Economy."

Trane Co., The, La Crosse, Wis.
Bulletin 14, 16 pp., 8½ x 10⅝ ins. Covers the complete line of Trane Heating Specialties, including Trane Bellows Traps, and Trane Bellows Packless Valves.
Bulletin 20. 24 pp., 8½ x 10⅝ ins. Explains in detail the operation and construction of Trane Condensation. Vacuum, Booster, Circulating, and similar pumps.
How to Cut Heating Costs. Booklet, 18 pp., 8½ x 11 ins. Illustrated.

HOISTS, TELESCOPIC

Gillis & Geoghegan, Inc. 535 West Broadway, New York.
G & G Telescopic Hoist. Booklet. 24 pp. 8½ x 11 ins. Illustrated complete data on hoists.
Ash Removal. Folder. 8½ x 11 ins. Illustrated. Hoists for removing ashes from basements.

HOSPITAL EQUIPMENT

The Frink Co., Inc., 369 Lexington Ave., New York City.
Catalog 426. 7 x 10 ins., 16 pp. A booklet illustrated with photographs and drawings, showing the types of light for use in hospitals, as operating table reflectors, linolite and multilite concentrators, ward reflectors, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses.

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.

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

John Van Range Co., Cincinnati, Ohio.
Practical Planning for Hospital Food Service. Brochure, 62 pp., 8½ x 11 inches. Illustrated.

Wilmot Castle Company, Union Trust Bldg., Rochester, N. Y.
The Hospital Sterilizer Data Sheets. Booklet, 16 pp., 8½ x 11 ins. Illustrated. Data on planning sterilizer installations.

HOTEL EQUIPMENT

Pick-Barth Company, Inc., Albert, 1200 West 35th St., Chicago, and 34 Cooper Square, New York.
Some Thoughts on Furnishing a Hotel. Booklet, 7½ x 9 ins. Data on complete outfitting of hotels.

INCINERATORS

Josam Mfg. Co., Michigan City, Ind.
Josam-Graver Incinerators. Folder, 4 pp., 8½ x 11 ins. Illustrated.

Kerner Incinerator Company, 715 E. Water St., Milwaukee, Wis.
Incinerators (Chimney-fed). Catalog No. 18 (Architects' and Builders' Edition). Size 8½ x 11 ins., 20 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.
Estate Type Kernerator. For Estates and Country Homes. Booklet, 8 pp., 8½ x 11 inches. Illustrated.

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.

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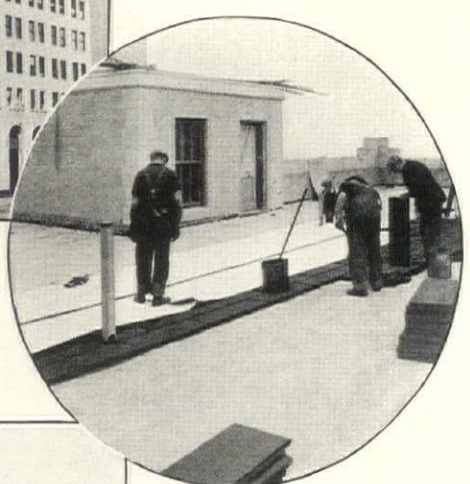
Eighty Telephone Buildings Have Dialed Armstrong's Corkboard

for perfect connection to top-floor comfort and permanent fuel economy

Left—The entire roof area of the Mountain States Tel. & Tel. Co. building, Denver, is insulated with Armstrong's Corkboard; top-floor offices are comfortable in any kind of weather. Architect—Wm. N. Bowman Co., Denver.

~ ~ ~

Below—On the roof of Mountain States Tel. & Tel. Co. building. Architect—Wm. N. Bowman Co., Denver; contractor—C. E. Walker Constr. Co., Denver; roofing contractor—Western Elaterite Roofing Co., Denver.



Below—Armstrong's Corkboard insulates the Southwestern Bell Telephone Co. roof, Kansas City, Mo. Architect—Hoit, Price & Barnes, Kansas City; associate architect—I. R. Timlin, St. Louis.

Below—2" Armstrong's Corkboard insulates the N. Y. Telephone Building, Buffalo. Architect—Vorhees, Genelin & Walker.

Some of the 80

Here is a partial list of the telephone buildings that have insured top-floor comfort and fuel economy with Armstrong's Corkboard Insulation on the roof.

New York Telephone Co., N. Y. C. —(3 *buildings*)
Portland Telephone Building, Portland, Me.
Telephone Exchange Building, Boston, Mass.
New England Tel. & Tel. Co., Boston, Mass.—(*Stadium Exchange*)
Bell Telephone Bldg., Athens, Ga.
So. Western Bell Telephone Bldg., St. Louis, Mo.
Indiana Bell Tel. Co., Marion, Ind.
Cumberland Tel. Co., Louisville, Ky.
So. Western Bell Telephone Bldg., Amarillo, Texas
Bell Tel. Co., Montreal, Canada
Wisconsin Tel. Co., Kenosha, Wis.
Michigan Bell Telephone Co., Ann Arbor, Mich.
Southern Bell Tel. & Tel. Co., Chattanooga, Tenn.
Southern Bell Tel. & Tel. Co., Savannah, Ga.
So. Western Bell Tel. Co., Dallas, Texas
Bell Tel. Co., Philadelphia, Pa.—(3 *buildings*)
So. Western Bell Telephone Bldg., Oklahoma City, Okla.
Southern Bell Telephone Bldg., Greensboro, N. C.
Northwestern Bell Tel. Co., Minneapolis, Minn.
Southern Bell Telephone Co., LaPlace, La.
New England Tel. & Tel. Co., Dover, N. H.
Michigan Bell Tel. Co., Detroit, Mich.—(4 *buildings*)
Ohio Bell Tel. Co., Columbus, Ohio —(2 *buildings*)

ARMSTRONG CORK & INSULATION CO., 900 Concord St., Lancaster, Pa.

Armstrong's Corkboard Insulation

for the roof of every building

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 180*

INSULATION—Continued

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 11¼ ins. Illustrates and describes use of insulation for structural purposes.

Cork Import Corporation, 345 West 40th Street, New York.

Novoid Cork Covering for Cold Pipes, Coolers and Tanks. Folder 8½ x 11 ins. Illustrated.

Novoid Corkboard Insulation. Folder 8½ x 11 ins. Illustrated.

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

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

Havemeyer Steel Joist. The Joist with the Twin-Tee Chords. Booklet, 24 pp., 8½ x 11 ins. Illustrated.

Modern Concrete Reinforcement. Brochure, 32 pp., 8½ x 11 ins. Illustrated.

Standard Practice for Placing Havemeyer Reinforcement in Columns, Beams and Slabs. Data sheets, 8½ x 11 ins. Illustrated.

KITCHEN EQUIPMENT

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

Hotels, Restaurants and Cafeteria Applications of Monel Metal. Booklet, 8½ x 11 ins., 32 pp. Illustrated. Gives types of equipment in which Monel Metal is used, with service data and sources of equipment.

Prometheus Electric Corporation, 360 West 13th St., New York.

Electric Heating Specialties. Booklet, 24 pages. 8½ x 11 ins. Illustrated. Specialties for heating, cooking, hospitals, organ lofts, etc.

John Van Range Co., Cincinnati.

Practical Planning for Church Food Service. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

Practical Planning for Club Food Service. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

Practical Planning for School Food Service. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

Planning Restaurants That Make Money. Booklet, 78 pp., 8½ x 11 ins. Illustrated. Excellent work on equipment.

Practical Planning for Hospital Food Service. Brochure, 62 pp., 8½ x 11 inches. Illustrated.

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, Inc., 119 East 57th St., New York, N. Y.

Lanterns. Booklet, 16 pp., 8½ x 11 ins. Illustrated. Deals with a fine assortment of fixtures for exterior and interior use.

LATH, METAL AND REINFORCING

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

Havemeyer Building Products, Booklet, 40 pp., 8½ x 11 ins. Illustrated.

Milcor Steel 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.

Truscon Steel Company, Youngstown, Ohio.

Truscon ¾-inch Hy-Rib for Roofs, Floors and Walls. Booklet, 8½ x 11 ins., illustrating Truscon ¾-inch Hy-Rib as used in industrial buildings. Plates of typical construction. Progressive steps of construction. Specification and load tables.

LAUNDRY MACHINERY

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.

Laundry Equipment of Small Hotels, Hospitals and Institutions. Booklet, 36 pp., 8½ x 11 ins. Illustrated.

General Laundry Machinery Corporation, 608 South Dearborn St., Chicago, Ill.

General All-Metal Washer. Booklet, 16 pp., 8½ x 11 ins. Illustrated. Timken-equipped Monel metal washer with one-lever control.

General Dry Tumbler. Brochure, 16 pp., 8½ x 11 ins. Illustrated. Specifications and details of Up-Draft Dry Tumbler with automatic temperature control.

Troy Laundry Machinery Co., Inc., 9 Park Place, New York City.

Laundry Machinery for Large Institutions. Loose-Leaf booklet, 50 pp., 8½ x 11 ins. Illustrated.

Laundry Machinery for Small Institutions. Loose-leaf brochure, 50 pp., 8½ x 11 ins. Illustrated.

Accessory Equipment for Institutional Laundries. Leather bound book, 50 pp., 8½ x 11 ins. Illustrated.

Dry Cleaning Equipment for Institutional Purposes. Brochure, 50 pp., 8½ x 11 ins. Illustrated.

LIGHTING EQUIPMENT

The Frink Co., Inc., 369 Lexington Ave., New York, N. Y.

Catalog 415, 8½ x 11 ins., 46 pp. Photographs and scaled cross-sections. Specialized bank lighting, screen and partition reflectors, double and single desk reflectors and Polaralite Signs.

Gleason Tiebout Glass Company, 67 West 44th St., New York, N. Y.

Fragment of Celestialite. Booklet, 24 pp., 7 x 10 ins. Illustrated. Data on lighting for offices, schools, hospitals, etc.

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

Holophane Company, Inc., 342 Madison Ave., New York, N. Y.

The Lighting of Schools; A Guide to Good Practice. Booklet. 24 pp., 8½ x 11 ins. Illustrated.

Lighting Specifications for Hospitals. Brochure, 30 pp., 8½ x 11 ins. Illustrated.

Industrial Lighting. Bulletin 448A. Booklet, 24 pp., 8½ x 11 ins. Illustrated.

Holophane Catalog. Booklet, 48 pp., 8½ x 11 ins. Combination catalog and engineering data book.

The Lighting of Schools. A Guide to Good Practice. Booklet, 24 pp., 8½ x 11 ins. Illustrated.

Smyser-Royer Co., 1700 Walnut Street, Philadelphia, Pa.

Catalog "J" on Exterior Lighting Fixtures. Brochure, illustrated, giving data on over 300 designs of standards, lanterns and brackets of bronze or cast iron.

Todhunter, 119 East 57th St., New York, N. Y.

Lighting Fixtures, Lamps and Candlesticks. 24 pp., 8½ x 11 ins. Illustrated. Fine assortment of lighting accessories.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

Industrial Lighting Equipment. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

Commercial Lighting. Brochure, 24 pp., 8½ x 11 ins. Illustrated.

Airport and Floodlighting Equipment. Booklet, 20 pp., 8½ x 11 ins. Illustrated.

MAIL CHUTES

Cutler Mail Chute Company, Rochester, N. Y.

Cutler Mail Chute Model F. Booklet, 4 x 9¼ ins., 8 pp. Illustrated.

MANTELS

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

Driwood Mantels. Booklet. 12 pp. 8½ x 11 ins. Illustrated. Fine line of eighteenth century English and American mantels.

Todhunter, Inc., 119 East 57th St., New York, N. Y.

Georgian Mantels. Brochure, 12 pp., 8½ x 11 ins. Illustrated. Illustrates and describes an excellent assortment of fine mantels based on Georgian precedent.

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.

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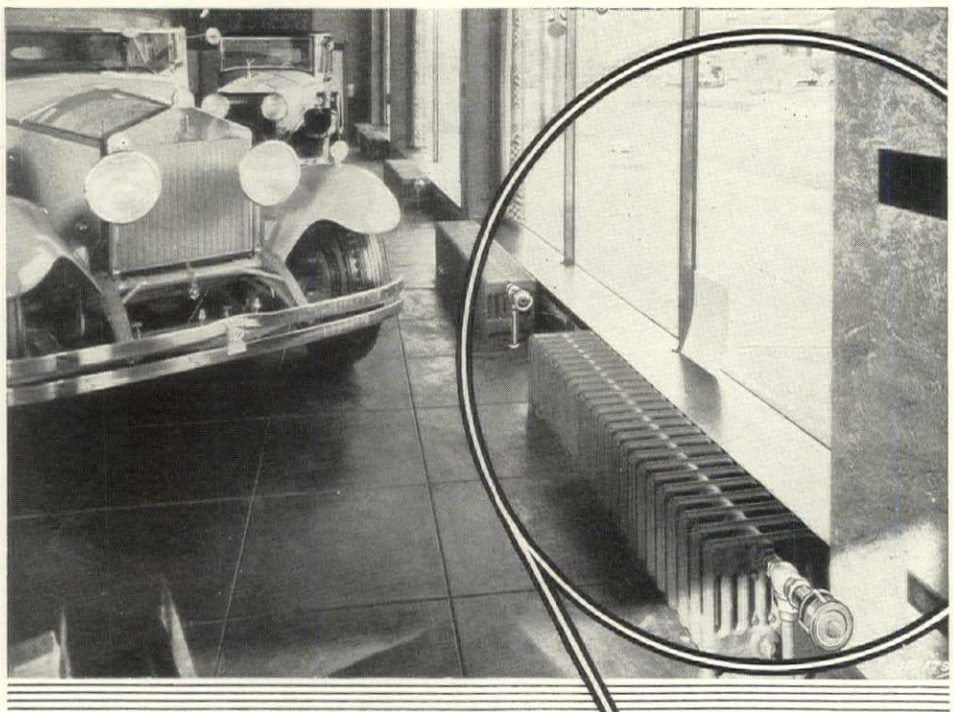
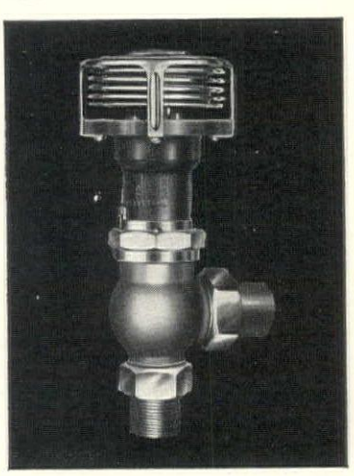


RADIATOR Attention Banished

No longer need radiators require the attention of the room occupants. Hand-operated radiator valves are now being discarded for the more efficient automatic radiator valves—valves that let you forget the radiators. Not only do these latest devices keep the room temperature at the comfortable point at all times—they save steam and thereby keep heating costs very, very low. In fact, a Sylphon Automatic Radiator Valve will soon pay for itself in the amount of fuel saved.

Architects and engineers may write-in Sylphon Automatic Radiator Valves with the full assurance that clients will receive nothing short of miraculous performance. Our organization is behind this valve—it is built to our high standard of quality for which other Sylphon products are so well known. Write for bulletin No. RA-250.



Sylphon TRADE MARK

AUTOMATIC RADIATOR VALVE

The Sylphon Automatic Radiator Valve is made in the angle and the globe valve types. The above bulletin not only describes these valves, but contains suggestions and drawings that should prove valuable to you. Write for a copy.

FULTON SYLPHON CO.

KNOXVILLE, TENN., U.S.A.

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

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 182*

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.
Your Dream Kitchen, Booklet, 11 pp., 7¾ x 10½ ins. Illustrated. Fine line of fittings for kitchens, breakfast alcoves, etc.

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., 5¾ 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.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Medusa Portland Cement Co., 1002 Engineers' Building, Cleveland.
"How to Paint Concrete and Masonry Surfaces." Booklet, 16 pp., 8½ x 11 ins. Illustrated.

Minwax Company, Inc., 11 West 42nd St., New York.
Color Card and Specifications for Minwax Brick and Cement Coating. Folder, 4 pp., 8½ x 11 ins. Illustrated.

National Lead Company, 111 Broadway, New York, N. Y.
Handy Book on Painting. Book, 5½ x 3¼ ins., 100 pp. Gives directions and formulæ for painting various surfaces of wood, plaster, metals, etc., both interior and exterior.

Red Lead in Paste Form. Booklet. 6¼ x 3½ ins., 16 pp. Illustrated. Directions and formulæ for painting metals.

Came Lead. Booklet, 6 x 8¾ ins., 12 pp. Illustrated. Describes various styles of lead cames.

Sherwin-Williams Company, 601 Canal Rd., Cleveland, Ohio.
Complete Architectural Specifications for painting, varnishing and lacquering, reprinted from the Sherwin-Williams Architectural Catalogue as it appears in Sweet's Architectural Catalogue. Form Number B 303. 8½ x 11, bound in paper, thirty pages of specifications and color chips; carries A. I. A. file number.

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.

PARTITIONS

Circle A. Products Corporation, New Castle, Ind.
Circle A. Partitions Sectional and Movable. Brochure. Illustrated. 8½ x 11¼ ins., 32 pp. Full data regarding an important line of partitions, along with Erection Instructions for partitions of three different types.

PARTITIONS—Continued

Irving Hamlin, Evanston, Ill.
Hamlinized Folding Partitions Made from Hamlin's Evanston Soundproof Doors, Sectional and Movable. Folder, 4 pp., 8½ x 11 ins. Illustrated.

Hauserman Company, E. F., Cleveland, Ohio.
Hollow Steel Standard Partitions. Various folders, 8½ x 11 ins. Illustrated. Give full data on different types of steel partitions, together with details, elevations and specifications.

Henry Klein & Co., 25 Grand Street, Elmhurst, L. I., N. Y.
Telesco Partition. Catalog, 8¼ x 11 ins., 14 pp. Illustrated. Shows typical offices laid out with Telesco partitions, cuts of finished partition units in various woods. Gives specifications and cuts of buildings using Telesco.

Detailed Instructions for Erecting Telesco Partitions. Booklet, 24 pp., 8½ x 11 ins. Illustrated. Complete instructions, with cuts and drawings, showing how easily Telesco Partition can be erected.

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

Richards-Wilcox Mfg. Co., Aurora, Ill.
Partitions. Booklet, 7 x 10 ins., 32 pp. Illustrated. Describes complete line of track and hangers for all styles of sliding parallel, accordion and flush-door partitions.

Structural Gypsum Corporation, Linden, N. J.
Service Sheet No. 4. Specifications for Gypsteel Partition File. Folder, 8½ x 11 ins. Illustrated.

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

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.

Bethlehem Steel Company, Bethlehem, Pa.
Bethlehem Wrought Steel Pipe, Catalog P. Booklet, 20 pp., 4¾ x 7¼ ins. Illustrated.

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.

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.

Maurice A. Knight, Akron, Ohio.
Knightware in the Princeton Chemical Laboratory. Booklet, 16 pp., 6¾ x 8½ ins. Illustrated.

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 deaereating systems for eliminating or retarding corrosion in hot water supply lines.

"National" Bulletin No. 25. "National" Pipe in Large Buildings. 8½ x 11 ins., 88 pp. This bulletin contains 254 illustrations of prominent buildings of all types, containing "National" Pipe, and considerable engineering data of value to architects, engineers, etc.

Modern Welded Pipe. Book of 88 pp., 8½ x 11 ins., profusely illustrated with halftone and line engravings of the important operations in the manufacture of pipe.

PLASTER

Best Bros. Keene's Cement Co., Medicine Lodge, Kans.
Information Book. Brochure, 24 pp., 5 x 9 ins. Lists grades of plaster manufactured; gives specifications and uses for plaster.

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

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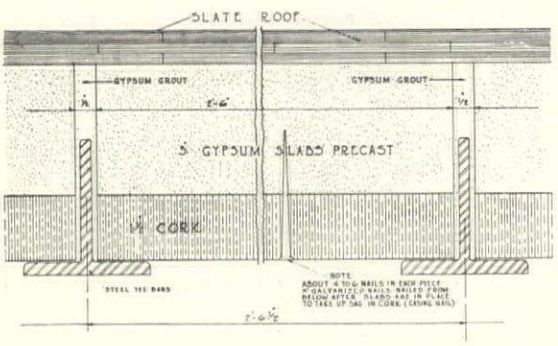
Address .....

Seton Hill College *uses* 24" NOVOID CORKBOARD INSULATION

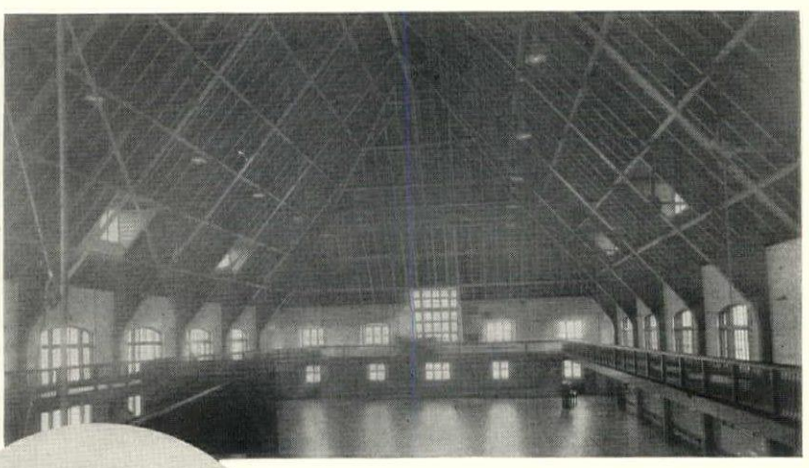


Roof permanently insulated with one layer on under side

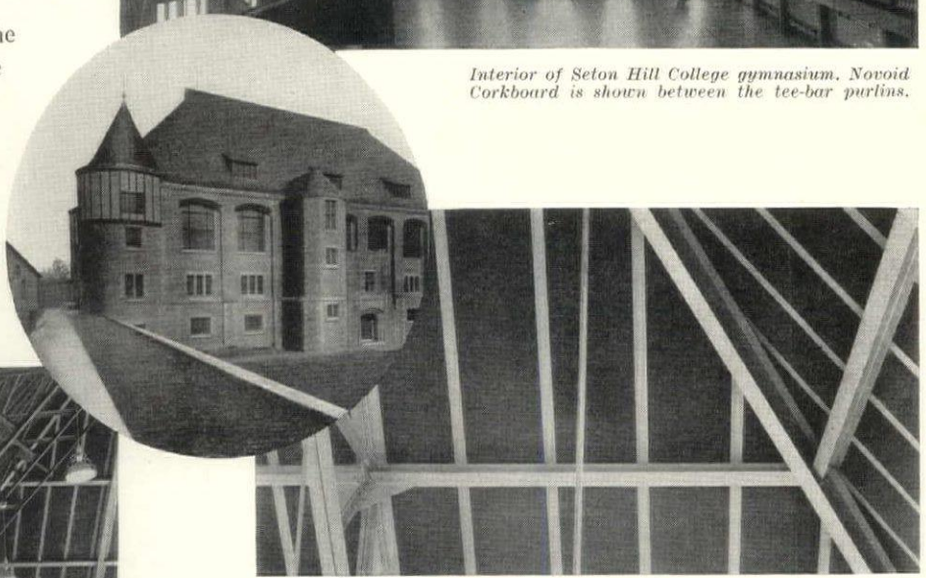
IN the new gymnasium of Seton Hill College, Greensburg, Pa., the roof is insulated with double-width (24") Novoid Corkboard, 1½" thick. The cork was laid on the flanges of the tee-bar purlins and nailed to the precast gypsum slabs on top of the cork.

Used in this way, Novoid Corkboard not only provides permanent protection against heat, cold and condensation of moisture, but it also has a tendency to deaden objectionable sounds.

Full information regarding the use of Novoid Corkboard for the insulation of roofs will be sent, with samples, on request. Cork Import Corporation, 345 West 40th Street, New York City, N. Y.

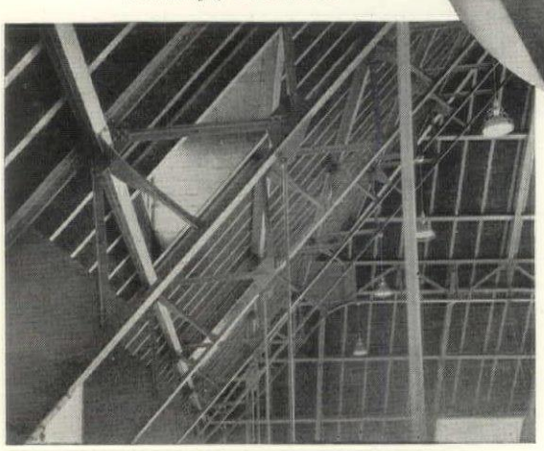


Interior of Seton Hill College gymnasium. Novoid Corkboard is shown between the tee-bar purlins.



Seton Hill College Gymnasium, Greensburg, Pa. Carlton Strong, Pittsburgh, architect. Duquesne Construction Co., Pittsburgh, contractors.

The rich, brown color of Novoid Corkboard makes a pleasing decorative treatment when left exposed. The surface may also be painted if desired.



The 6" x 24" trimmings from the full-size sheets of Novoid Corkboard were used to insulate around the dormers.

Novoid Corkboard Insulation

THE CLOSE-STRUCTURED CORKBOARD

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 184*

PLASTER—Continued

Interior Walls Everlasting. Brochure, 20 pp., 6¼ x 9¼ ins. Illustrated. Describes origin of Keene's Cement and views of buildings in which it is used.

PLUMBING EQUIPMENT

Clow & Sons, James B., 534 S. Franklin St., Chicago, Ill.

Catalog M. 9¼ x 12 ins., 184 pp. Illustrated. Shows complete line of plumbing fixtures for Schools, Railroads and Industrial Plants.

Crane Company, 836 S. Michigan Ave., Chicago, Ill.

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

Plumbing Suggestions for Industrial Plants. Catalog, 4 x 6½ ins., 34 pp. Illustrated.

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

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.

Speakman Company, Wilmington, Del.

Catalog K. Booklet, 150 pp., 8½ x 10⅞ ins. Illustrated. Data on showers and equipment details.

PNEUMATIC TUBE SYSTEMS

G & G Atlas Systems, Inc., 544 West Broadway, New York.

12 pp., 8½ x 11. Illustrated booklet of tube systems for retail stores and other buildings.

4 pp., 8½ x 11. Data Sheet showing schematic diagrams for hotel, bank, factory and wholesale buildings, table of sizes, space requirements and preliminary layout steps. A. I. A. 35h21.

PUMPS

Kewanee Private Utilities Co., 442 Franklin St., Kewanee, Ill.

Bulletin E. 7¾ x 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.

Nash Engineering Company, South Norwalk, Conn.

Bulletin 52. Brochure. 6 pp., 10½ x 7¾ ins. Illustrated in color. Devoted to Jennings Standard Centrifugal Pumps for house service, boosting city water pressure to supply top stories, for circulating warm water, etc.

Bulletin 97. Booklet. 16 pp., 10½ x 7¾ ins. Illustrated in color. Describes the design, construction and operation of the Jennings Suction Sump Pump.

Bulletin 11. Brochure. 8 pp., 10½ x 7¾ ins. Illustrated in color. Deals with Nash Hytor Vacuum Pumps for air and gases.

The Trane Co., La Crosse, Wis.

Trane Small Centrifugal Pumps. Booklet, 3¾ x 8 ins., 16 pp. Complete data on an important type of pump.

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

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

Modern Concrete Reinforcement. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

Truscon Steel Company, Youngstown, Ohio.

Shearing Stresses in Reinforced Concrete Beams. Booklet, 8½ x 11 ins., 12 pp.

RESTAURANT EQUIPMENT

John Van Range Company, Cincinnati.

Planning Restaurants That Make Money. Booklet, 78 pp., 8½ x 11 ins. Illustrated. Excellent work on equipment.

ROOFING

Federal Cement Tile Co., 608 S. Dearborn Street, Chicago.

Catalog and Roof Standards. Booklet, 36 pp. 8½ x 11 ins. Illustrated. Describes Featherweight Concrete Insulating Roof Slabs, including complete data, weights and dimensions, specifications and detail drawings. Also includes complete information on Featherweight Nailing Concrete Roof Slabs for use with ornamental slate or copper covering. The catalog is profusely illustrated and contains also a partial list of users.

Examples of Theaters and Theater Roofs. Brochure, 16 pps., 8½ x 11 ins., Illustrated. Contains views of theaters designed by some of the country's leading architects.

Federal Interlocking Tile and Glass Tile. 4 pp., 8½ x 11 ins. Illustrates and describes complete roof or precast concrete slabs requiring no composition covering.

Heinz Roofing Tile Co., 1925 West Third Avenue, Denver, Colo.

Plymouth-Shingle Tile with Sprocket Hips. Leaflet, 8½ x 11 ins. Illustrated. Shows use of English shingle tile with special hips.

Italian Promenade Floor Tile. Folder, 2 pp., 8½ x 11 ins. Illustrated. Floor tiling adapted from that of Davanzati Palace.

Mission Tile. Leaflet, 8½ x 11 ins. Illustrated. Tile such as are used in Italy and Southern California.

Georgian Tile. Leaflet, 8½ x 11 ins. Illustrated. Tiling as used in old English and French farmhouses.

Johns-Manville Corporation, New York.

The New Book of Roofs. Brochure, 24 pp., 8½ x 11 ins. Illustrated. Roofing from the Architect's point of view.

Ludowici-Celadon Company, 104 So. Michigan Ave., Chicago, Ill.

"Ancient" Tapered Mission Tiles. Leaflet, 8½ x 11 ins., 4 pp. Illustrated. For architects who desire something out of the ordinary this leaflet has been prepared. Describes briefly the "Ancient" Tapered Mission Tiles, hand-made with full corners and designed to be applied with irregular exposures.

Milcor Steel 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.

SCHOOL EQUIPMENT

John Van Range Co., Cincinnati.

Practical Planning for School Food Service. Booklet, 32 pp., 8½ x 11 ins. Illustrated.

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.

Nash Engineering Company, South Norwalk, Conn.

Bulletin 67. Booklet. 16 pp. 10¾ x 7½ ins. Illustrated in color. Describes Type A Jennings Sewage Ejector for handling Unscreened sewage and raising it from basements below sewer level.

Bulletin 103. Brochure. 16 pp. 10¾ x 7½ ins. Illustrated in color. Deals with small size Type B Jennings Sewage Ejector.

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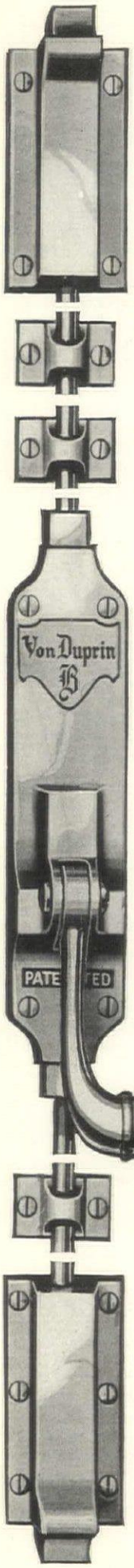


Von Duprin

Self-Releasing Fire and Panic Exit Latches

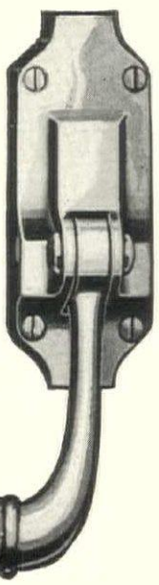
Painting the Lily -- Successfully

To improve upon the superfine has always been the dream of real craftsmen.

But opportunities come very rarely.

One came to us, however, when the new series genuine Type "B" Von Duprin devices were designed. By a happy inspiration—if we may use that phrase—we were able to radically cut down the number of parts and make the actuating members of the new design strong and long wearing beyond all precedent. The superlatively good was made even better.

To secure these better devices, we suggest that you specify them separately from the finishing hardware and, of course, by name. Thus you foster clean competition, since all reputable dealers can buy these devices at the same fair prices.



VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Listed as Standard by Underwriters Laboratories

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

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.

SHELVING-STEEL

David Lupton's Sons Company, Philadelphia, Pa.
Lupton Steel Shelving. Catalog E. Illustrated brochure, 40 pp., 8½ x 11 ins. Deals with steel cabinets, shelving, racks, doors, partitions, etc.

STEEL PRODUCTS FOR BUILDING

Bethlehem Steel Company, Bethlehem, Pa.
Steel Joists and Stanchions. Booklet, 72 pp., 4 x 6¾ ins. Data for steel for dwellings, apartment houses, etc.

Bethlehem Structural Shapes Bound Volume, 368 pp., 4¼ x 6¾ ins. Illustrated.

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 8¼ ins. Illustrated. Describes and illustrates the use of stone for small houses with floor plans of each.

Volume 6. Series B. Indiana Limestone School and College Buildings. 8½ x 11 ins., 80 pp. Illustrated.

Volume 12. Series B. Distinctive Homes of Indiana Limestone. 8½ x 11 ins., 48 pp. Illustrated.

Old Gothic Random Ashlar. 8½ x 11 ins., 16 pp. Illustrated.

STORE FRONTS

Brasco Manufacturing Co., 5025-35 South Wabash Ave., Chicago, Ill.
Catalog No. 33. Series 500. All-Metal Construction. Brochure, 20 pp., 8½ x 11 ins. Illustrated. Deals with store fronts of a high class.

Catalog No. 34. Series 202. Standard construction. Booklet, 16 pp. 8½ x 11 ins. Illustrated, complete data on an important type of building.

Detail Sheets. Set of seven sheets, 8½ x 11 ins., printed on tracing paper, giving full-sized details and suggestions for store front designs.

Davis Solid Architectural Bronze Sash. Set of six sheets, 8½ x 11 ins., printed on tracing paper. Full-sized details and suggestions for designs of special bronze store front construction.

The Kawneer Company, Niles, Mich.
Catalog M, 1929 Edition, 64 pages, 8½ x 11 ins., with the A.I.A. File No., profusely illustrated. General Catalog.

Detail Sheet and descriptive folder, 8½ x 11 ins., with A.I.A. File No. featuring "B" Store Front Construction, designed along modernistic lines.

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Bayley Pivoted Windows. Booklet, 24 pp., 8½ x 11 ins. Illustrated. Sections, hardware, and other details, and illustrations of installations.

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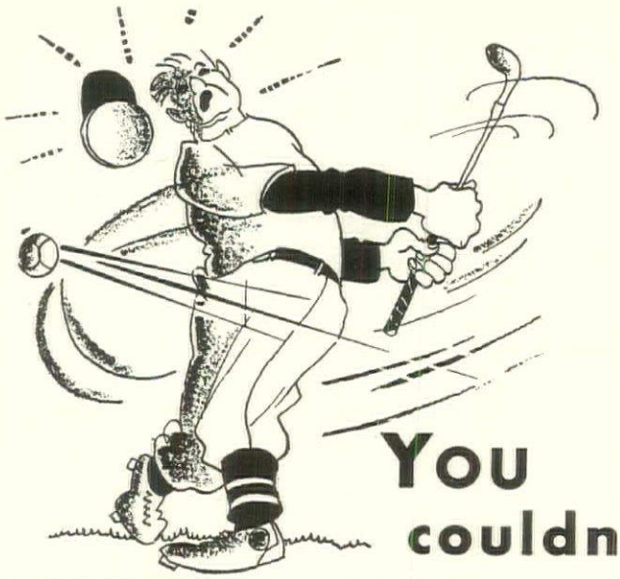

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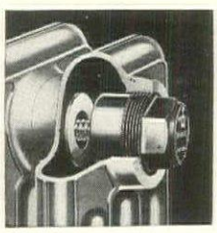

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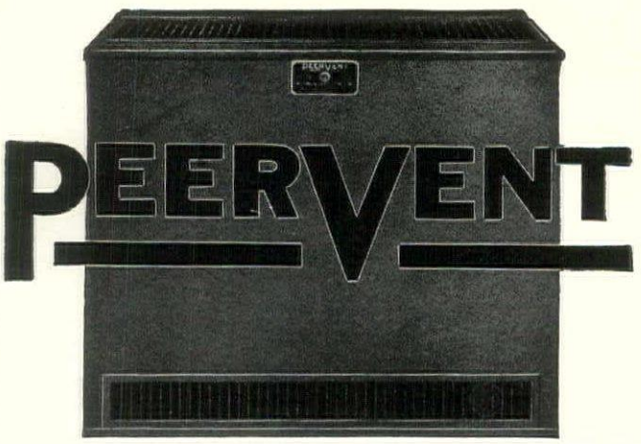

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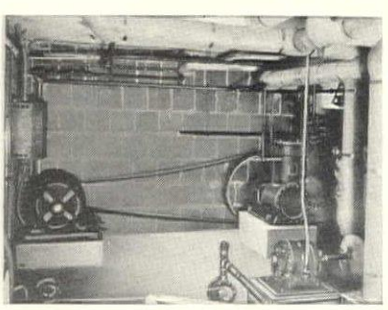

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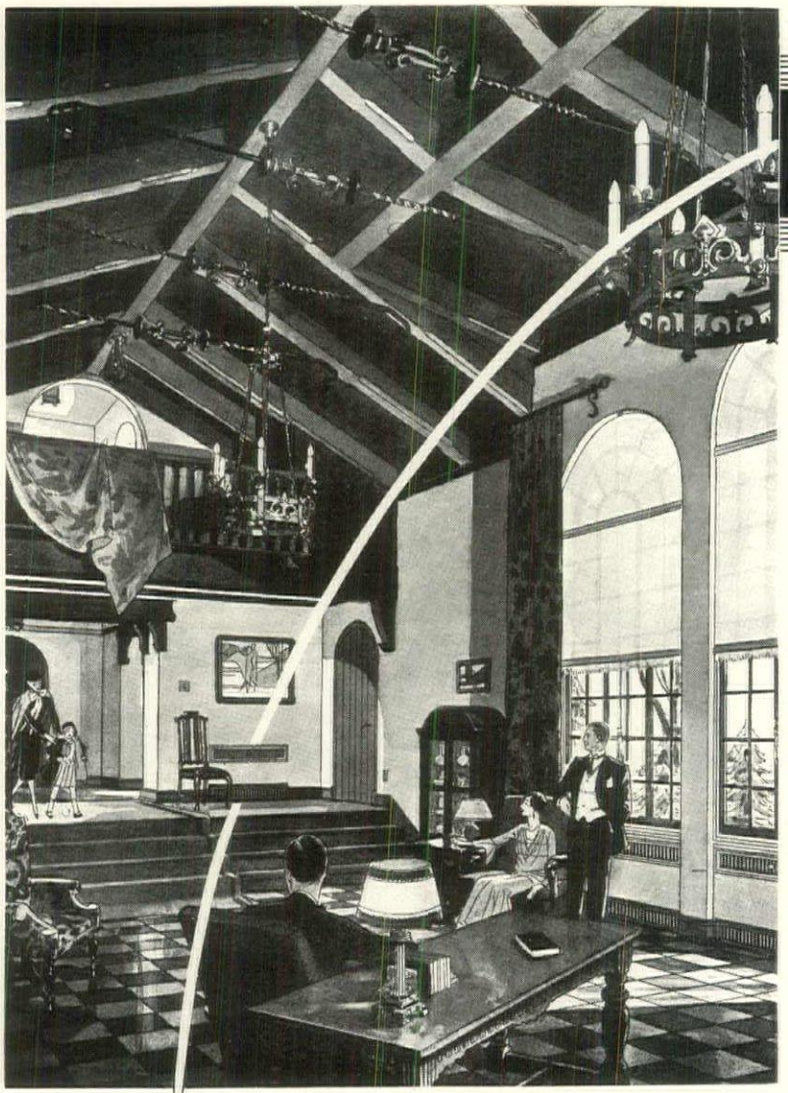

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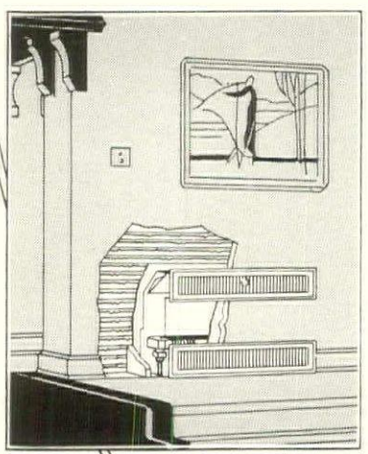

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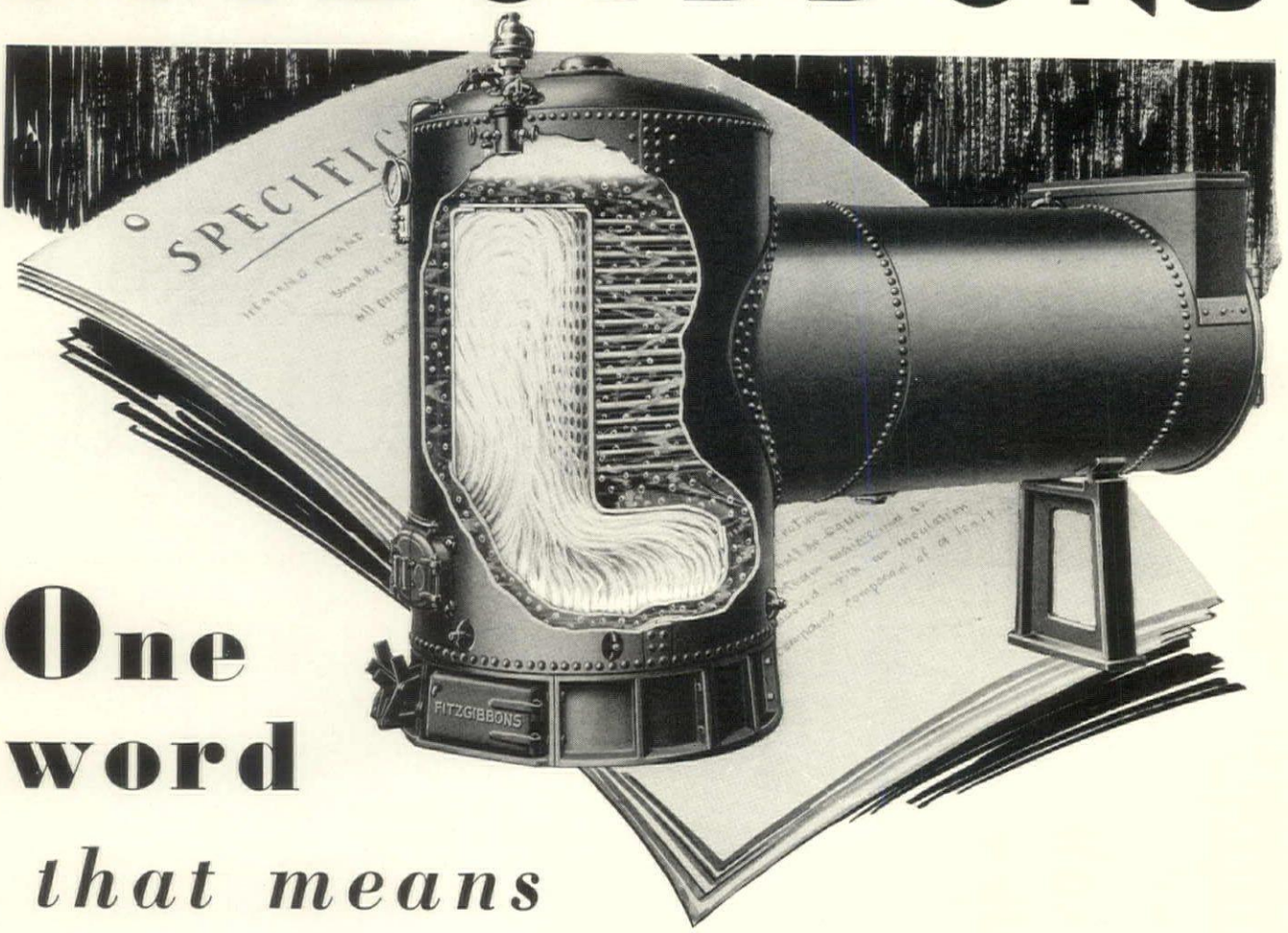

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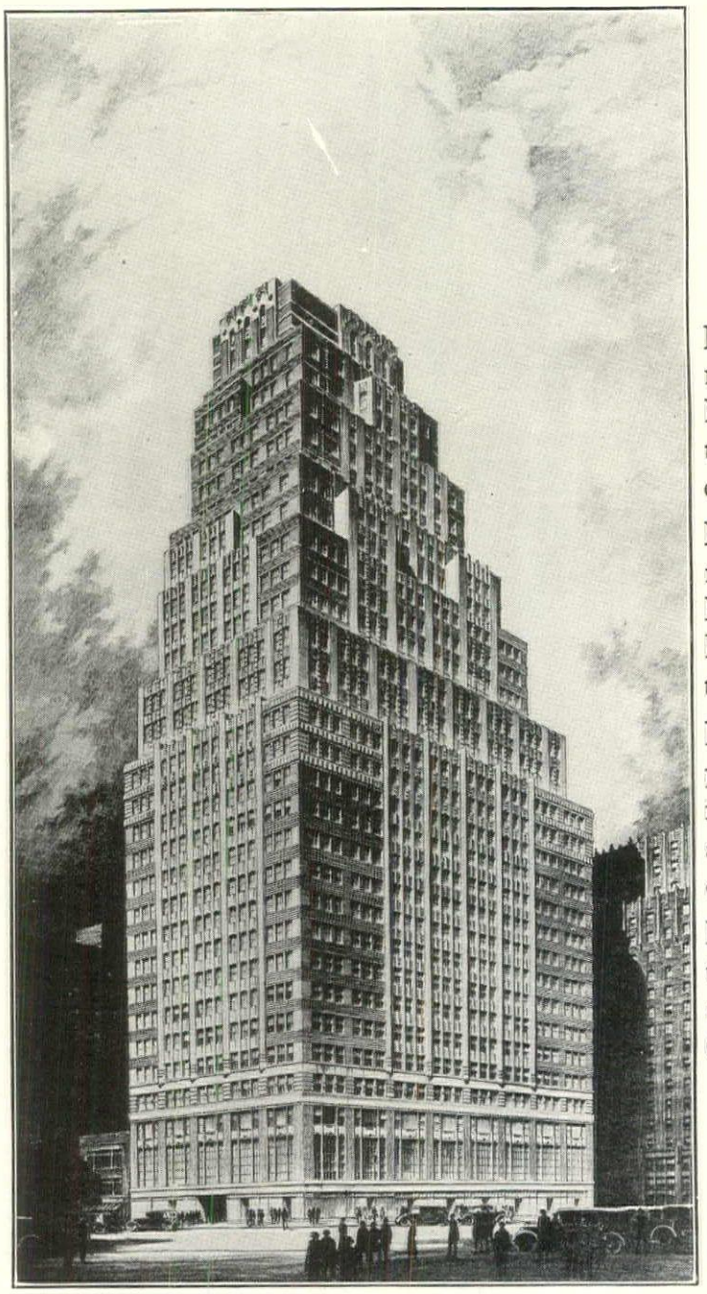

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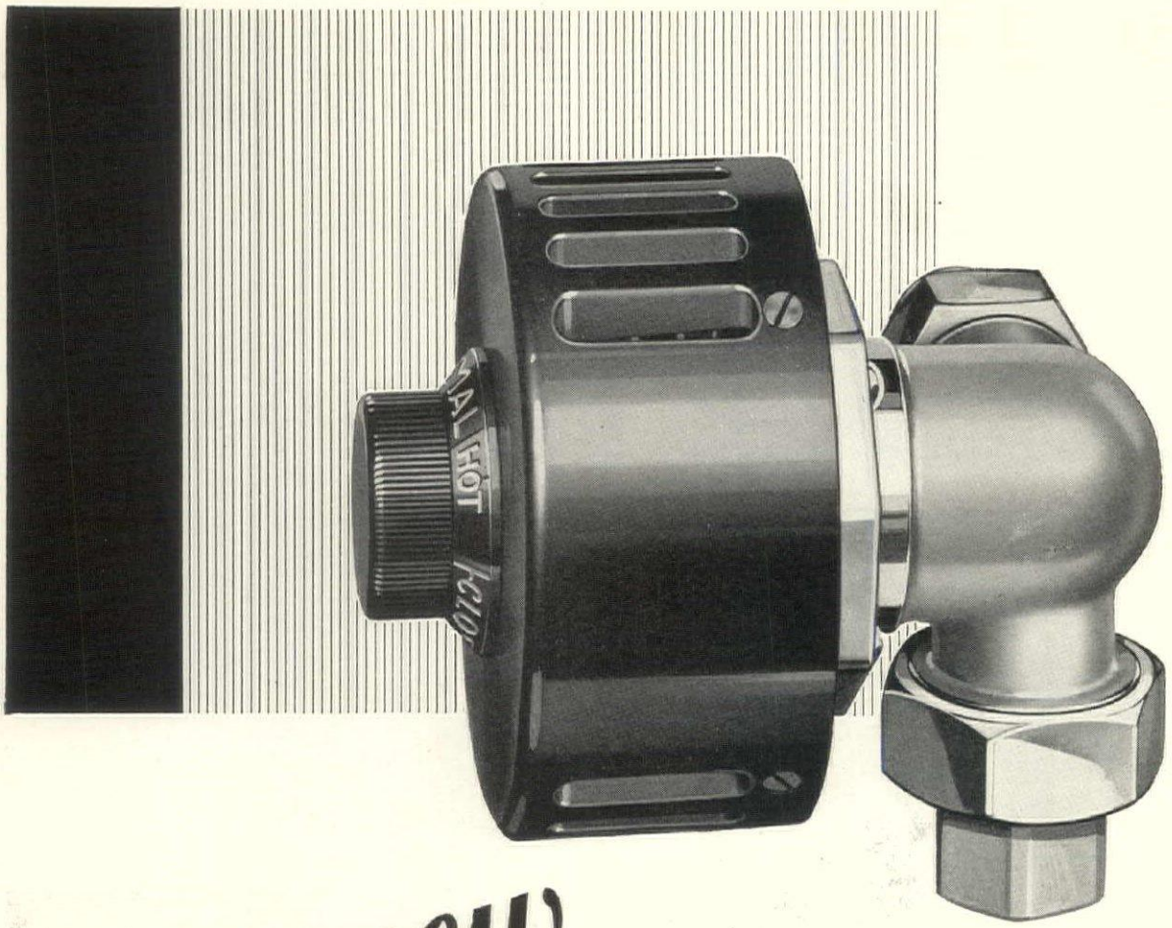

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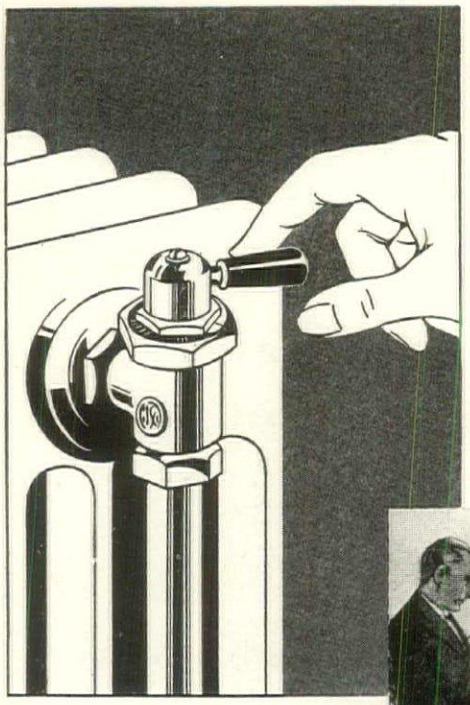

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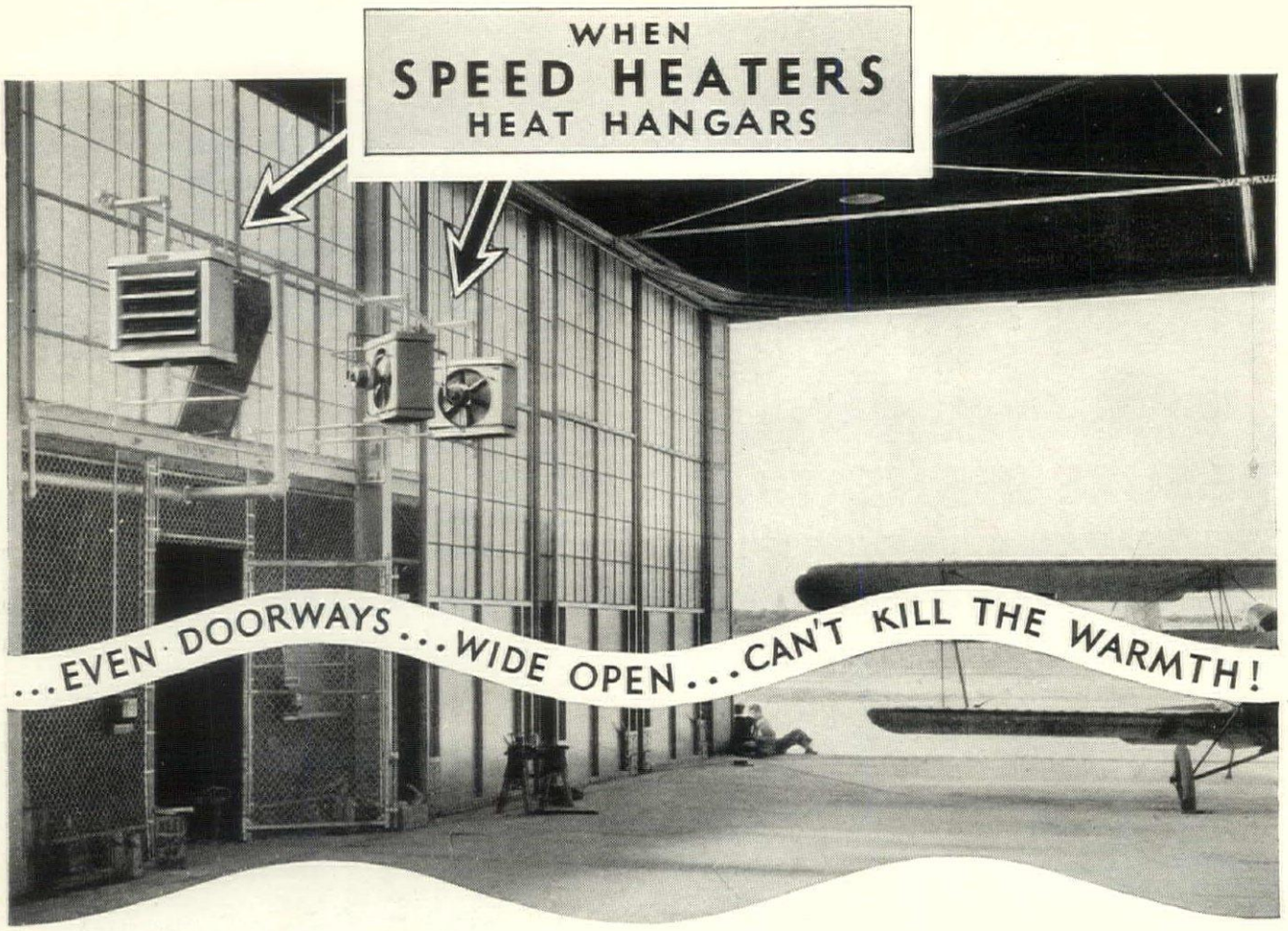


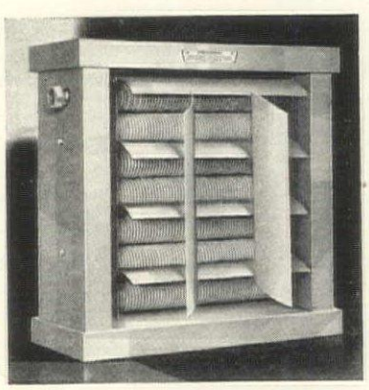
Airplane Hangar; Round Hill Airport, So. Dartmouth, Mass. Equipped with Sturtevant Speed Heaters.

ONE of the severest tests to which any heating system can be put is airplane hangar service. Wide-open doors ... cold drafts ... high ceilings ... large heat losses! All tax heating equipment to the utmost.

Speed Heaters have proved ideal for this use.

Offices, stores, auditoriums, gymnasiums, showrooms, warehouses, garages and factories are but a few of the many other places in which Speed Heaters are being installed to provide *uniform* warmth under *all* conditions.

Any architect would find the following two bulletins informative and helpful: (1) The Speed Heater ... A short talk on a radically new development in heating apparatus; (2) Complete Data on Speed Heaters for Architects. Our nearest office would be glad to send you copies.



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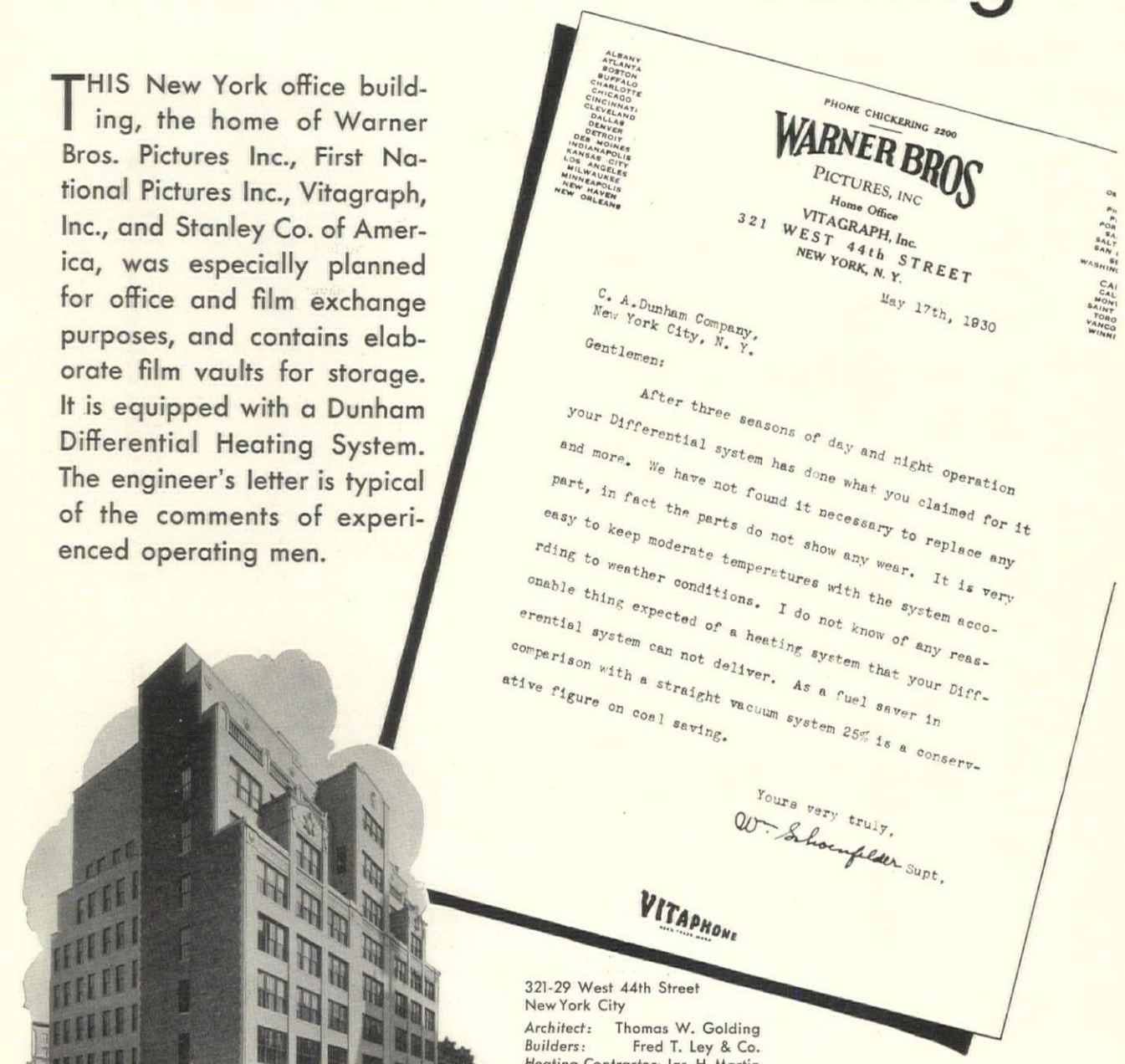
Comfort and fuel economy combined in Dunham Differential Heating

THIS New York office building, the home of Warner Bros. Pictures Inc., First National Pictures Inc., Vitagraph, Inc., and Stanley Co. of America, was especially planned for office and film exchange purposes, and contains elaborate film vaults for storage. It is equipped with a Dunham Differential Heating System. The engineer's letter is typical of the comments of experienced operating men.



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WARNER BROS
PICTURES, INC
Home Office
VITAGRAPH, Inc.
321 WEST 44th STREET
NEW YORK, N. Y.

May 17th, 1930

C. A. Dunham Company,
New York City, N. Y.

Gentlemen:

After three seasons of day and night operation your Differential system has done what you claimed for it and more. We have not found it necessary to replace any part, in fact the parts do not show any wear. It is very easy to keep moderate temperatures with the system according to weather conditions. I do not know of any reasonable thing expected of a heating system that your Differential system can not deliver. As a fuel saver in comperison with a straight vacuum system 25% is a conservative figure on coal saving.

Yours very truly,
W. Schoenfelder Supt.

VITAPHONE

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Architect: Thomas W. Golding
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C. A. DUNHAM CO.

Dunham Building

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Many existing heating plants can be changed over to Differential operation, improving the quality of service and reducing fuel bills 25 to 40 per cent. Write for complete data.

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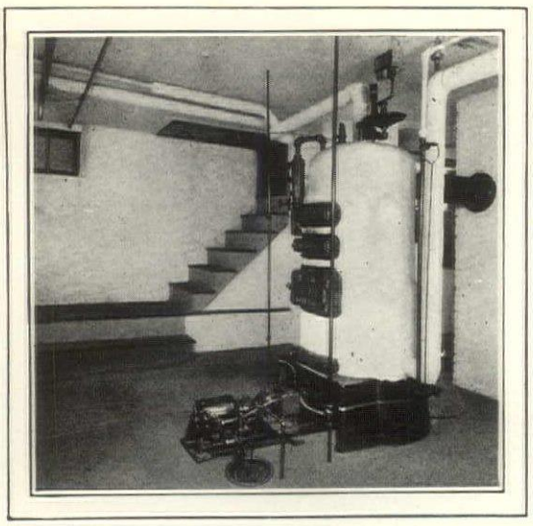


The Hardinge

was intended for

medium-priced *homes*

MANY architects think that because the Hardinge Fuel Oil Burner is so widely used in homes of wealth, it must necessarily be an expensive device. That is a mistake. The Hardinge compares in price with any good oil burner. Its exceptional staunchness and economy therefore recommend it for bungalows even as its dependableness has won it a place where price is not a first consideration.

Nothing can be said here about the Hardinge which has not already been said about other good oil burners. The difference is in degree rather than kind. You see this in the weight of castings, the careful machine work, the combustion principle which anticipates any coming changes in fuel oil composition as oil refining advances.

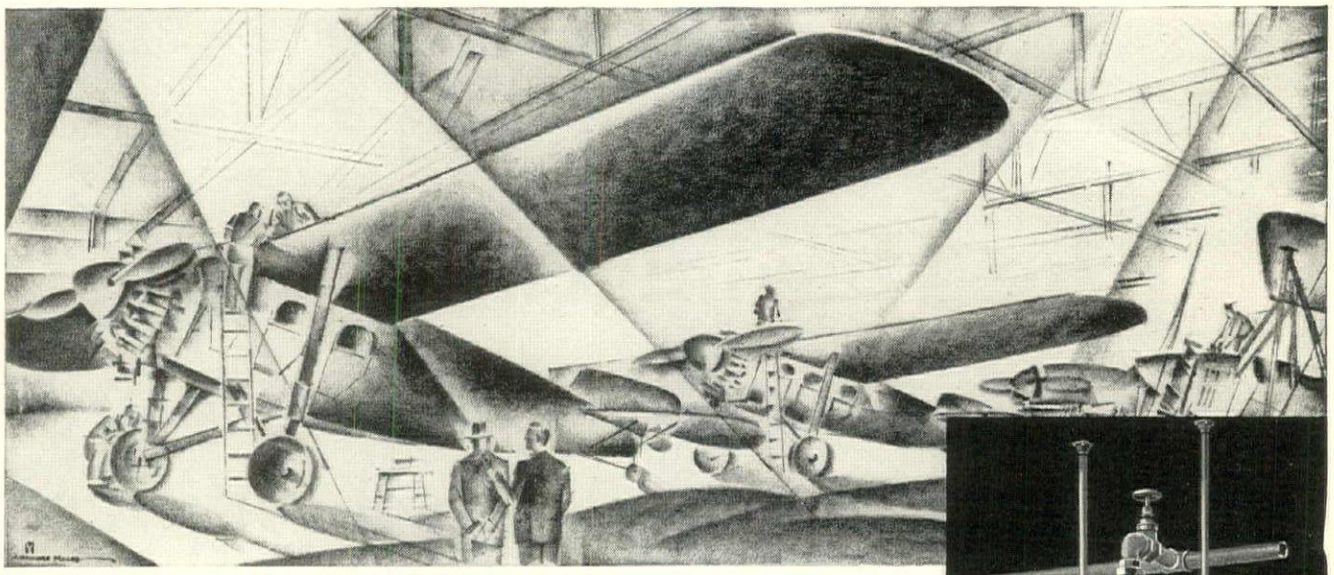
The Hardinge is recommended to you with the knowledge that your reputation, in turn, depends to some degree upon the equipment you recommend to your clients. Would you like to have all the Hardinge details? Ask, then, for the Hardinge working data, if you please. Hardinge Bros., Inc., 4149 Ravenswood Avenue, Chicago, Illinois.

HARDINGE

Fuel Oil Burners

WHEN HEAT IS Controlled

- - *working conditions are right*



HEAT WITH UNIT HEATERS

It is easy to maintain an even temperature—not too hot, not too cold—throughout a building . . . to keep workers comfortable and contented, after Venturafin Unit Heaters are installed and heat becomes *controlled.*

Equipped with an individual three-way heat control switch, each Venturafin Unit forces heated air at LOW, MEDIUM or HIGH speed—at exactly the required velocity to correct irregularities of temperature in a building. Individually adjustable streamline air-jet deflectors direct heated air in one or several directions simultaneously. Venturafin Unit Heaters force heated air *where* you want it, *when* you want it and *as much as* you want.

Many are the unusual advantages offered by the Venturafin Method of Heating—cold corners and heat pockets disappear . . . no more wasteful heating of ceiling areas first . . . drafts are eliminated . . . absences of workers because of colds, headaches and similar ailments are reduced, and efficiency increased.

Venturafin Units are ideal for heating factories, shops, stores, garages, and many other types of buildings. They are easy to install and can be used on high, medium or low pressure steam applications. We shall be pleased to furnish you complete data direct from the factory, or upon application at any of our nation-wide sales and service offices. (1042)

AMERICAN BLOWER CORPORATION, DETROIT, MICHIGAN
CANADIAN SIROCCO COMPANY, LIMITED, WINDSOR, ONTARIO
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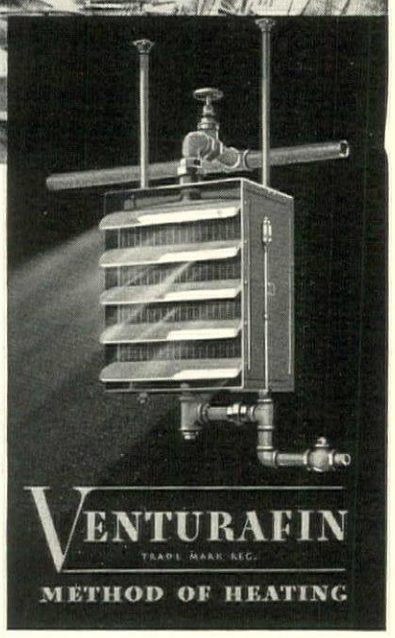

Venturafin Units can be mounted on wall, column or ceiling with ordinary ¾-inch hanger pipes. Heat control with Venturafin Units becomes automatic by the application of a Mercoid Thermostat.

Venturafin Units for industrials are equipped with a three-speed heat control switch.

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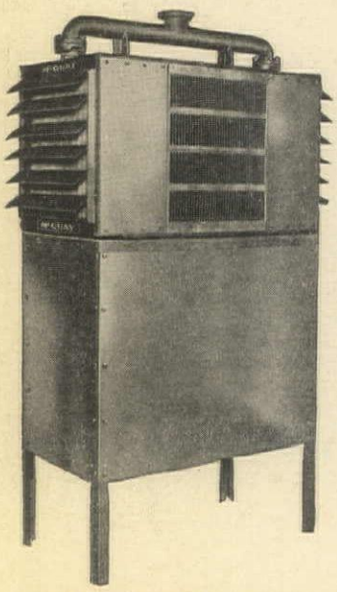
VENTILATING, HEATING, AIR CONDITIONING, DRYING, MECHANICAL DRAFT
MANUFACTURERS OF ALL TYPES OF AIR HANDLING EQUIPMENT SINCE 1881

The MODERN WAY of HEATING - Factories, Garages, etc.

Wherever a tough heating problem has been met, McQuay Unit Heaters have provided a solution. For they force the heated air *down* into the "working areas" where it is needed—instead of allowing it to drift up towards the roof where it is wasted. With McQuay Units buildings can be heated quicker—spots formerly impossible to heat are kept warm and comfortable—and **considerable fuel is saved because *all* the heat is used.**

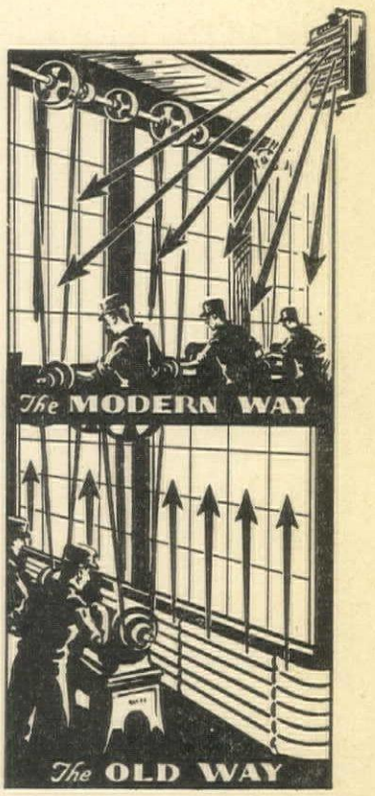
McQUAY UNIT HEATERS



This McQuay Twin Heater, designed to meet special requirements, sends heated air in two directions. In sizes equivalent to from 1000 to 2000 sq. ft. of radiation.

Four distinctive McQuay features insure far greater value for each dollar spent:

1. The *all copper* heating element increases conductivity and prevents corrosion.
2. Seamless copper tubes welded into heavy copper headers *provide equal expansion throughout the heating element* and eliminate chance of leaks that often occur when tubes and headers are of different materials.
3. The motor rests in a *cork insulated saddle* which absorbs vibration and eliminates noise.
4. The heating element is suspended in its cast frame so that expansion strains in the frame can't be carried to the heating element, tending to pull it apart.



McQuay Unit Heaters force the air down where the men are. They *use* all the heat instead of wasting most of it up towards the roof.

There is a McQuay Unit Heater for every heating need. Try one or more in some hard to heat spot. The results will indicate the advisability of a complete installation. The initial cost is usually considerably less than for pipe coils or cast iron.

ALSO: *Cabinet and Concealed Radiators for Heating Homes, Hotels, Apartments, etc. Ask for separate Bulletins.*

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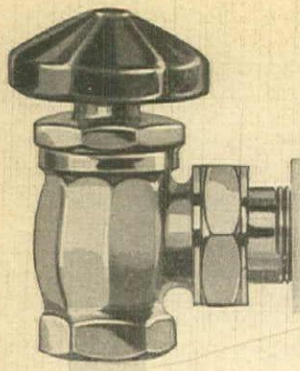

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Four months ago there appeared the first of a number of announcements from Jas. P. Marsh & Company, presenting to the trade *truly modern heating* . . . a series of heating units and systems that were utterly new and revolutionary in design. We knew the outstanding merits of these products. Their complete success waited only upon the response they received from you who are the final judges of worth.

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Your unquestioned approval has been accepted by us as a distinct obligation to merit your continued approbation.

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