THE ARCHITECTURAL RECORD

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THE INTEGRITY TRUST COMPANY,
PHILADELPHIA

PAUL P. CRET, ARCHITECT

—The main banking room has a well lighted atmosphere with a freshness and cheerfulness unusual in banks where the old idea of strength and security was stressed.

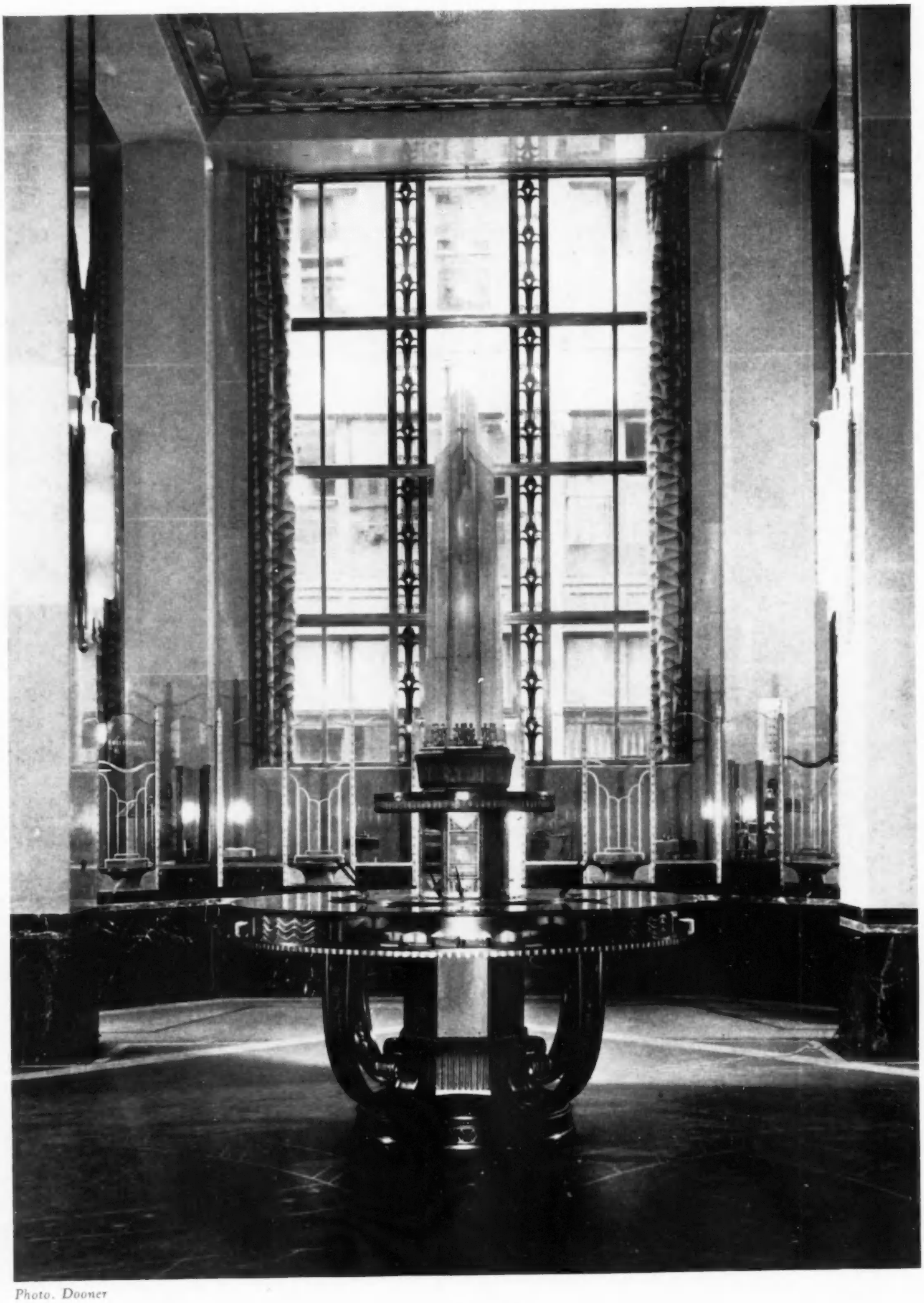

Photo. Dooner

BANKING ROOM
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT

THE ARCHITECTURAL RECORD

AN ILLUSTRATED MONTHLY MAGAZINE OF
ARCHITECTURE & THE ALLIED
ARTS & CRAFTS

VOLUME 66 | OCTOBER·1929 | NUMBER 4

INTEGRITY TRUST COMPANY, PHILADELPHIA

PAUL PHILIPPE CRET, ARCHITECT

THE PROBLEM:

Column spacing and floor heights of a typical office building already in course of erection had to be accepted. It was necessary, therefore, to design around a given structural framework, which also established the outer windows and fixed the location of the office building entrance to the bank, and in a measure the entrance from the street to the bank, although in the latter case a little more leeway was possible in the design.

The area of the first floor plan of the bank is approximately 10,350 feet square.

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REQUIREMENTS OF CLIENTELE:

As a merger of various banks, it is distinctly a down-town bank for depositors with large individual accounts. The officers' space is prominent and larger than is usual, while the window space and tellers' cages are smaller in area than would usually be the case, and not for a large number of small depositors.

This also affects the general character of the luxurious interior, the use of precious materials, marbles, bronze and monel metal of fine workmanship. The window wickets, too, are not formidable, for there is not the usual necessity in this well policed district of protection against robberies.

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EVOLUTION OF PLAN:

The bank has its quarters in the first floor, basement (the safe deposit department), and the mezzanine (the investment and title departments). The Board of Directors' room is now on the twenty-second floor, although originally it was placed at the back of the first floor.

The central aisle widens out to an octagonal space around a large central check desk of ornamented bronze, monel metal, and etched glass. This octagonal rotunda is the line of teller windows. These include two savings windows, eight paying and receiving windows, the credit and information departments, the discount and collateral departments with two windows and a counter, the corporate trust department with three windows and the foreign exchange department with a counter.

The concourse part of the public space will accommodate benches for visitors and is separated from the bank officers by a rail of imported Pyrenees black and white marble with ornamental bronze gates. The lower part of the bank screens round the rotunda are of this same marble. The bank screen itself is of bronze and glass. The floor of all the public space is in a design of imported marbles and colored terrazzo with brass lines and ornaments.

The mezzanine floor arrangement was an attempt to bring into some *rapport* with the main banking quarters two departments which could not be on the same floor because of the limits of space. These are the investment and title departments.

The title department contains two private offices and five title settlement rooms, all these with linoleum floors and separated by screen partitions of walnut and plate glass. In the ceiling of this department, which is acoustically treated, are skylights. The investment department overlooks the main banking room and contains a large general office and a private office separated by a walnut and plate glass screen partition.

The safe deposit department is in the basement and reached by a marble staircase through an ornamental bronze gate. From this lobby are entrances to the wash rooms, as well as the bank connections to the record storage and service parts of the building.

Through the entrance gate into the safe deposit department, one reaches the safe deposit hall, cork-floored and wainscoted in walnut. At the left is the entrance to the vault, through a wall made entirely of stainless steel. At the other end of the hall are the individual coupon booths, fifteen in number, open at the top, and each large enough for two persons. Between the booths and the vault entrance are two large conference rooms.

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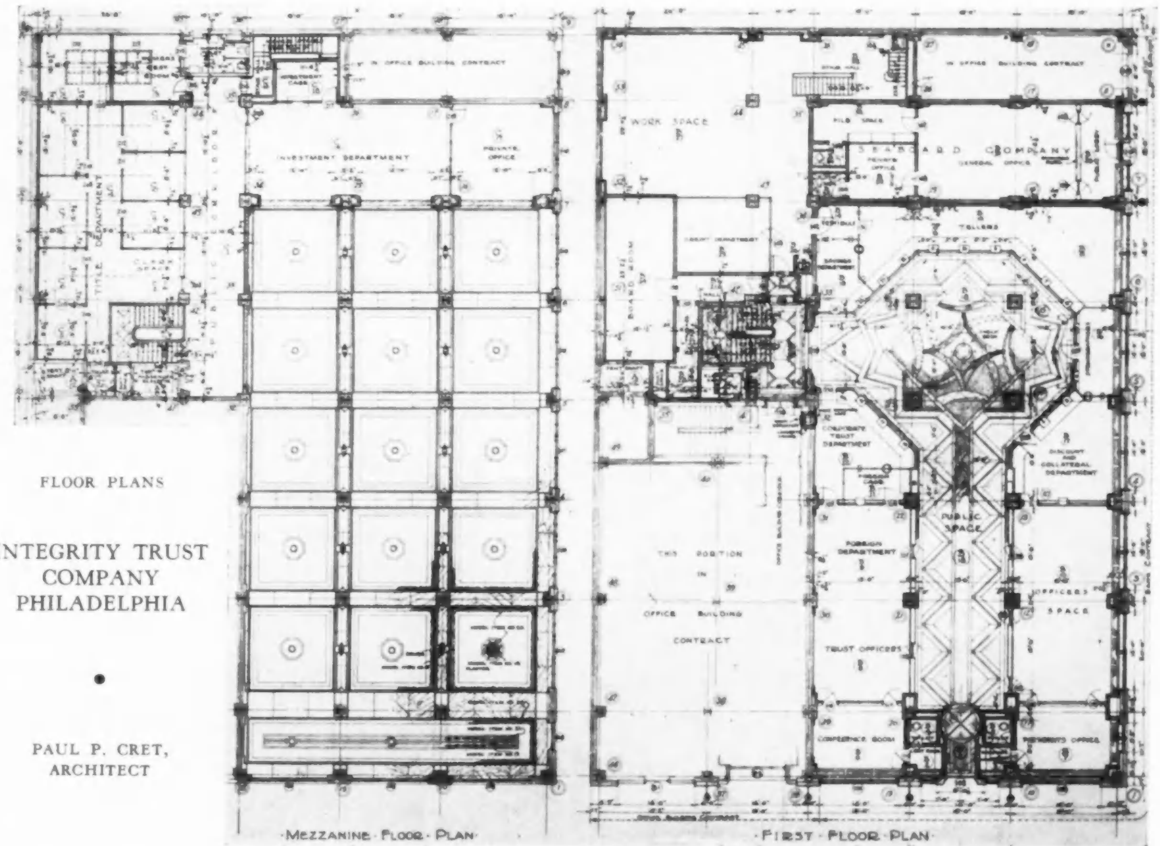
EVOLUTION OF STYLE:

Since the requirements of windows and columns fixed a simple and mechanical solu-



FLOOR PLANS

INTEGRITY TRUST COMPANY PHILADELPHIA

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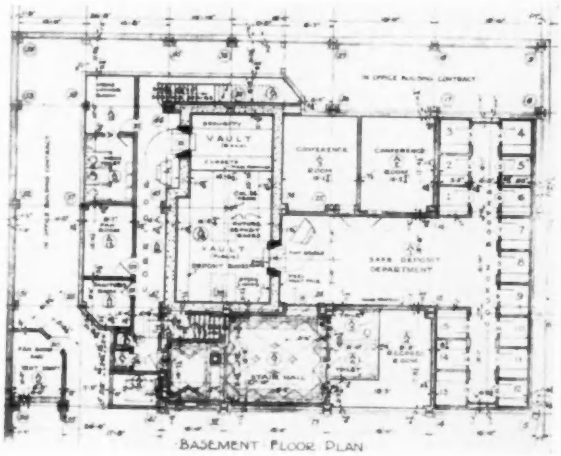
PAUL P. CRET, ARCHITECT

tion, it was felt that a simple treatment of rich materials with an absence of moldings and other ideas of third dimensional architecture would be appropriate. The result was a logical solution of conditions.

The use of imported marble in a combination of well selected colors gives an effect without elaboration of form. The marbles are Rose de Provence in the wall paneling, Hauteville for the columns, Pyrenees Black and White for the base with an insert of Rouge Royale; the floors are terrazzo and marble with brass strips in designs.



BASEMENT FLOOR PLAN
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT

Ten large square-headed openings on the exterior have bronze sash, with bottom panels of St. Genevieve Gold Vein imported marble and bronze ornaments. The base of the building under these windows, and the frame of the bank and office building entrances, are imported Swedish Emerald Pearl granite. The grilles are bronze, light and delicate. All bank windows are fixed double glazed sash, which will in a large measure exclude external noises.

The interior colors are warm with soft contrasts, except for the dark marble at the base. The terrazzo floor in general has a dark value, the upper part of the room is in pastel shades, and the ceiling silver.

•

SCULPTURE:

In the large wall panels are five inserts of stone sculpture by the French sculptor, A. Bottiau, depicting "Agriculture," "Trade," "Industry," "Transportation" and "Navigation." Some of these have recently been reproduced in Rapin's *Modern Decorative Sculpture*.

Over the bank entrance door, set in the Swedish Emerald Pearl granite frame and edged with an ornamental band of monel metal, is a bronze bas-relief by Bottiau, symbolic of the Integrity Trust Company. The entrance doors below are ornamented in bronze and monel metal.

•

EQUIPMENT:

Furniture and equipment, including lamps, inkstands, and desks, have been designed specially by the architect.

An innovation is the concentration of the check desks into one large feature on axis with the main entrance, and crowned with light. This desk is made of a combination of bronze and monel metal with etched glass in the top and in the light.

•

ILLUMINATION:

The entrances to the office building and the bank are flanked by large hanging bronze lanterns with etched glass. The artificial light in the main banking room comes from pier fixtures so arranged as to emphasize the direction of the public corridor. These also are largely of etched glass with very light frames of bronze.

•

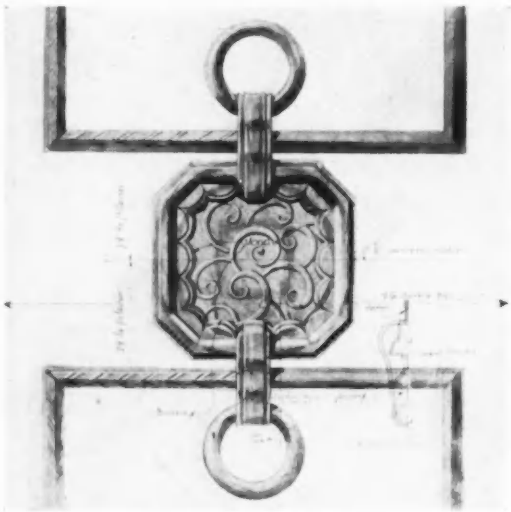
VENTILATION:

It was, of course, necessary to install forced ventilation, which is accomplished by the "Gerdes" system, a high velocity supply system distributed and exhausted at many places. In this case, the usual Gerdes outlets of galvanized iron were made a part of the general interior decoration of the bank, fitting into the plaster ceilings and the painted treatment.

Photo. Dooner

ENTRANCE DOOR

INTEGRITY
TRUST COMPANY
PHILADELPHIA
PAUL P. CRET,
ARCHITECT



DETAIL DRAWING
OF
ORNAMENT FOR BEAM
SOFFIT

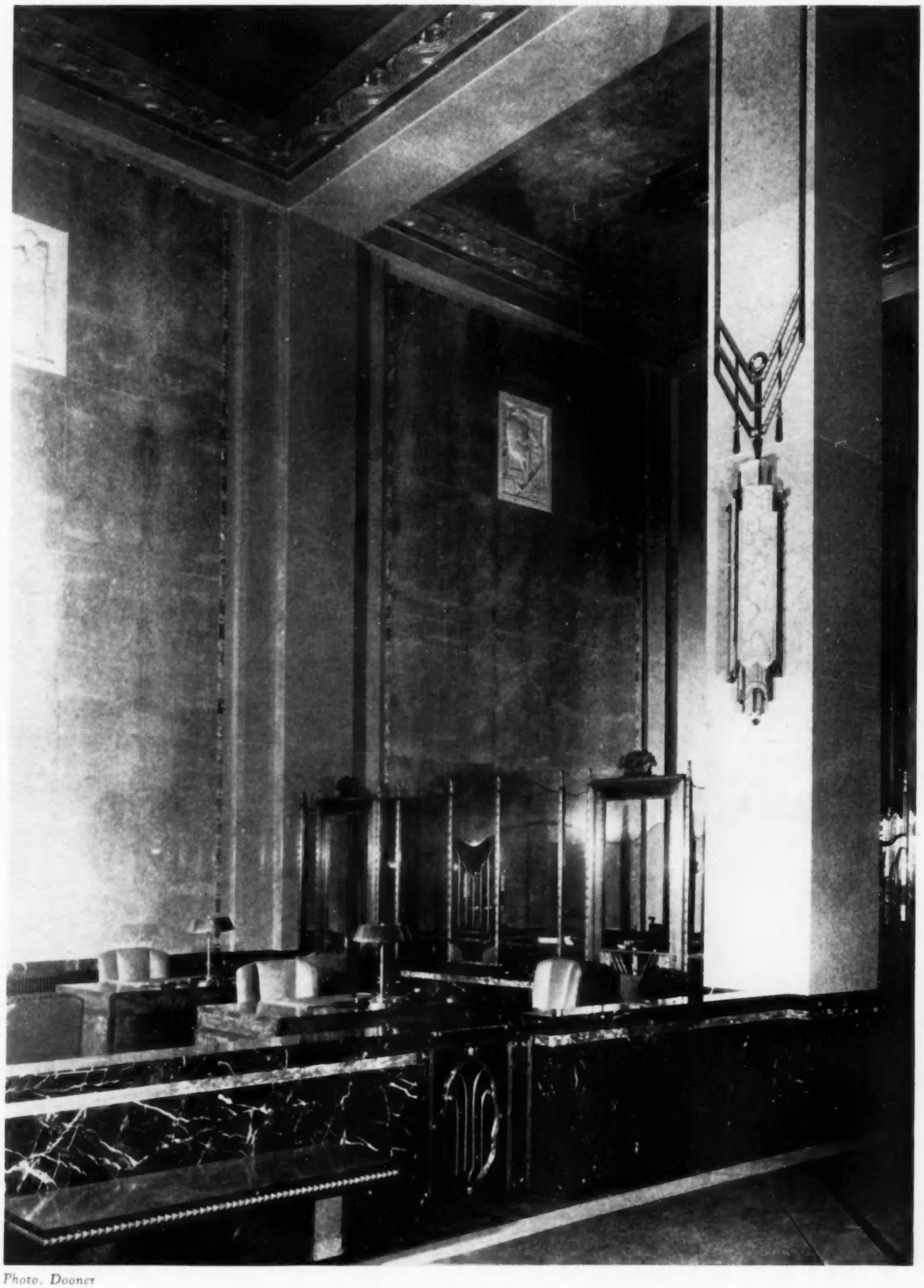


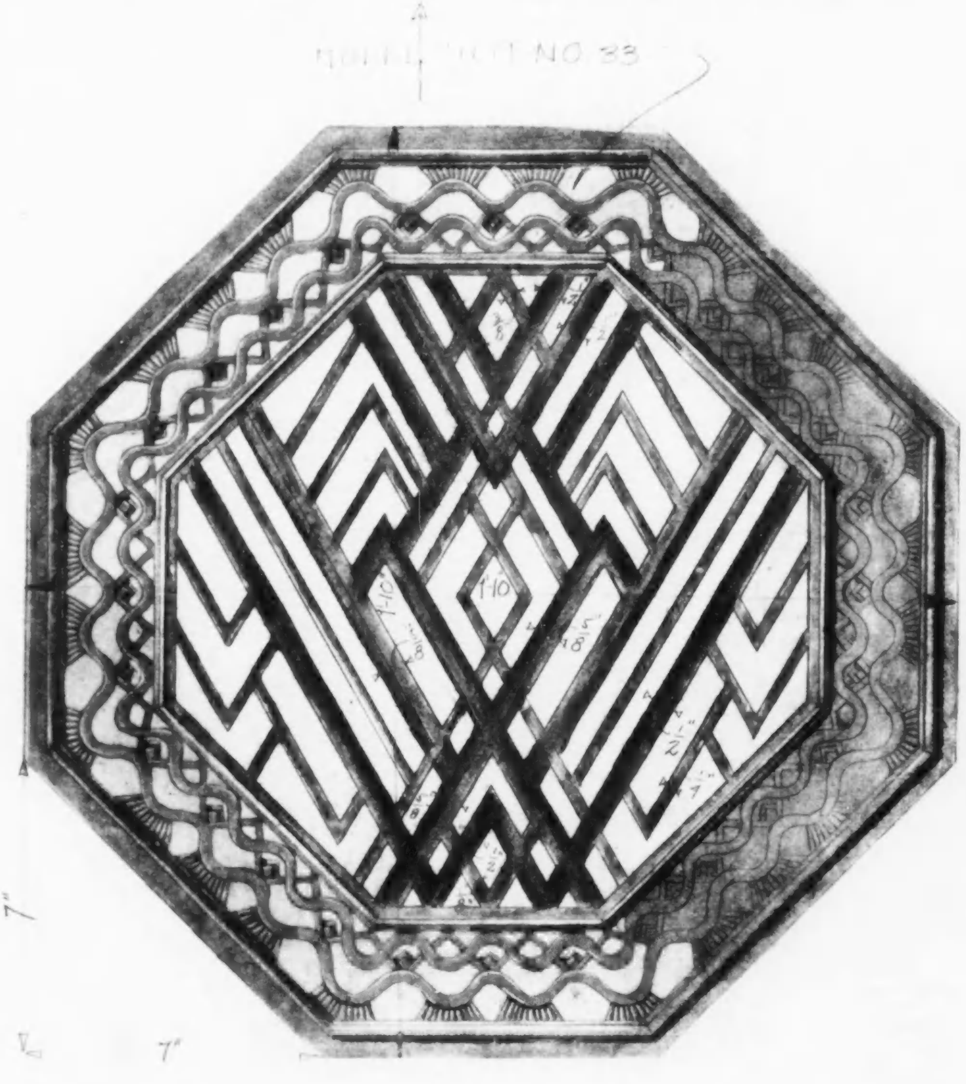
Photo. Dooner

BANK OFFICERS' SPACE
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT

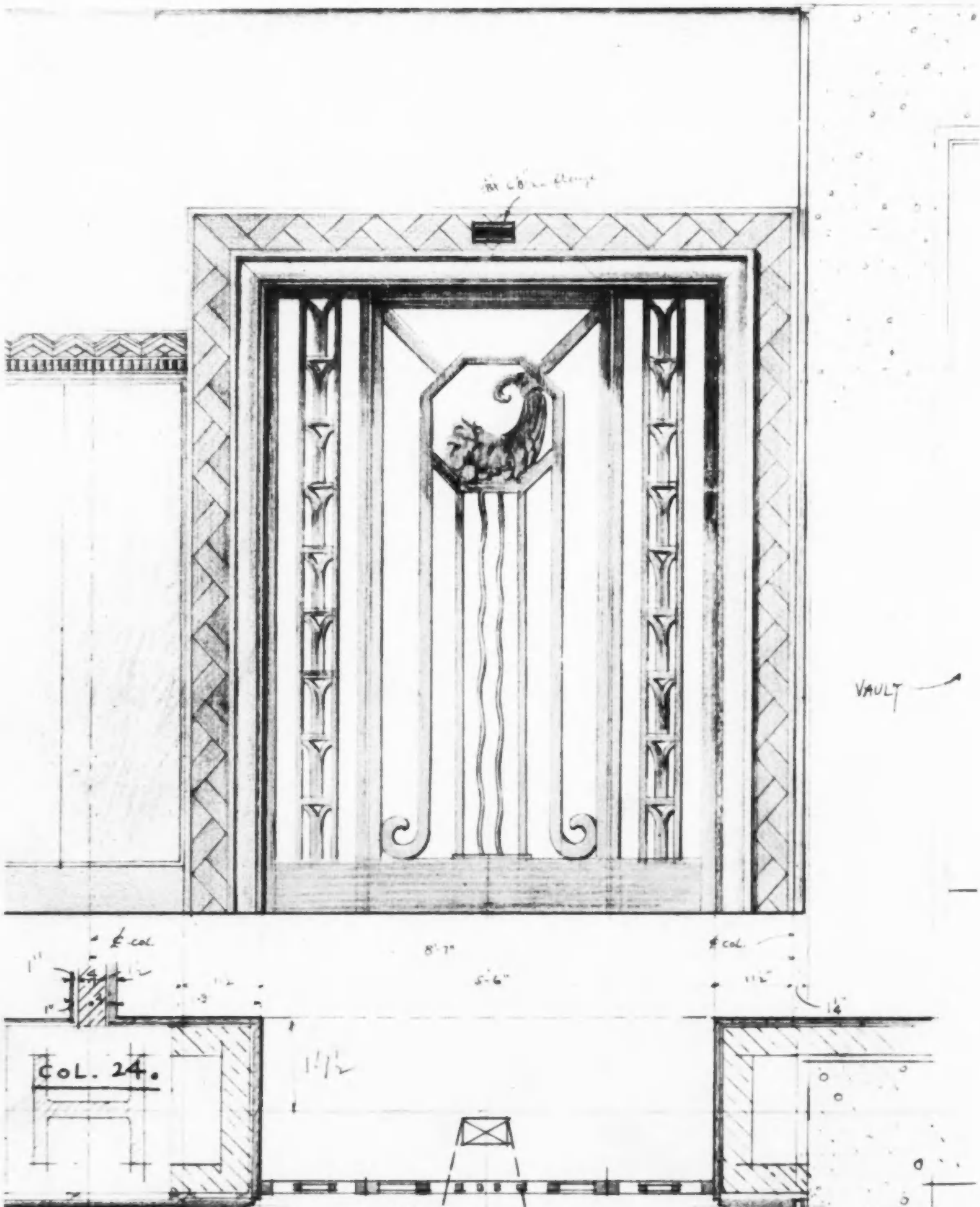
Photo. Dooner

PRESIDENT'S OFFICE
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT

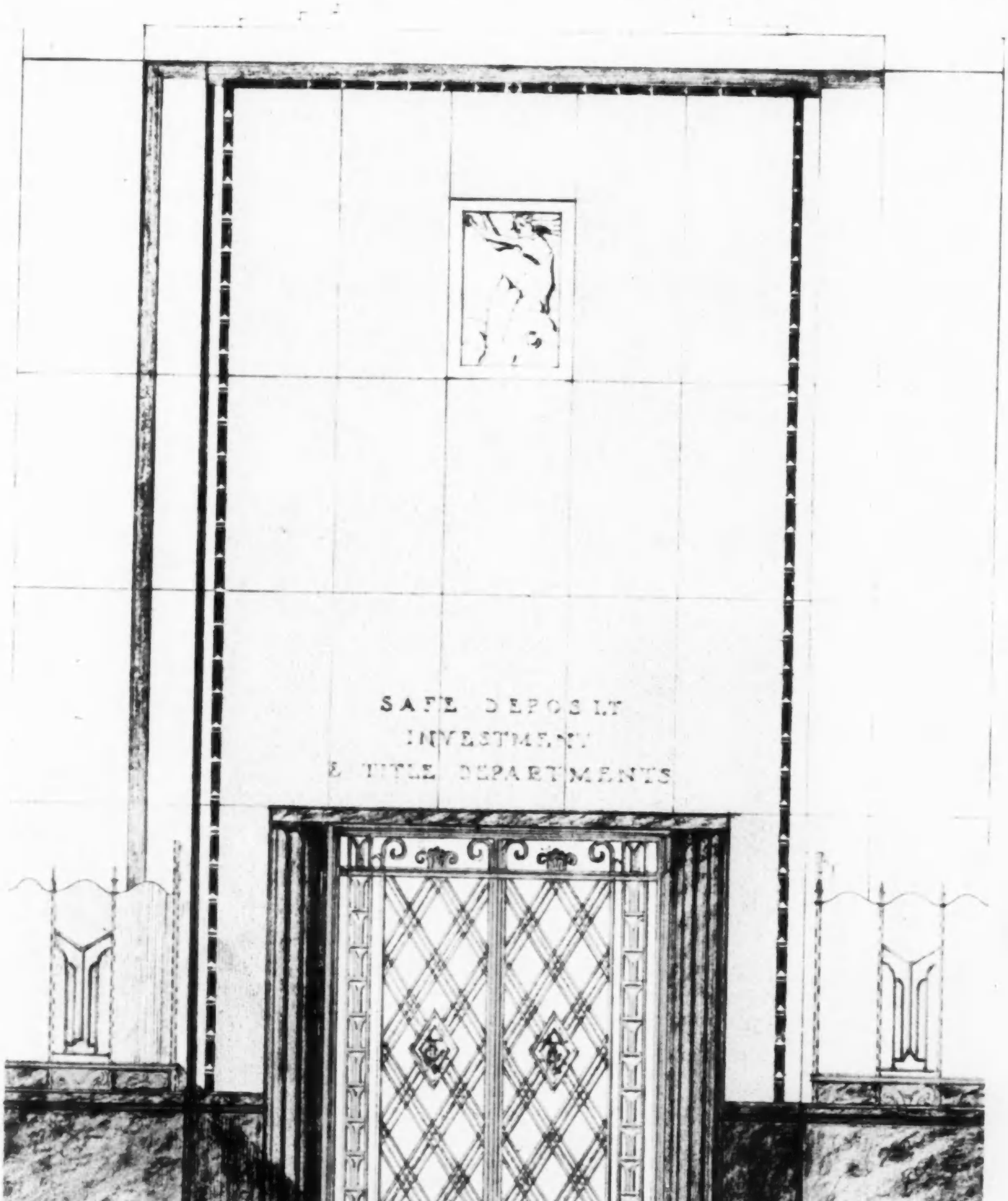
PORTFOLIO
OF
WORKING DRAWINGS



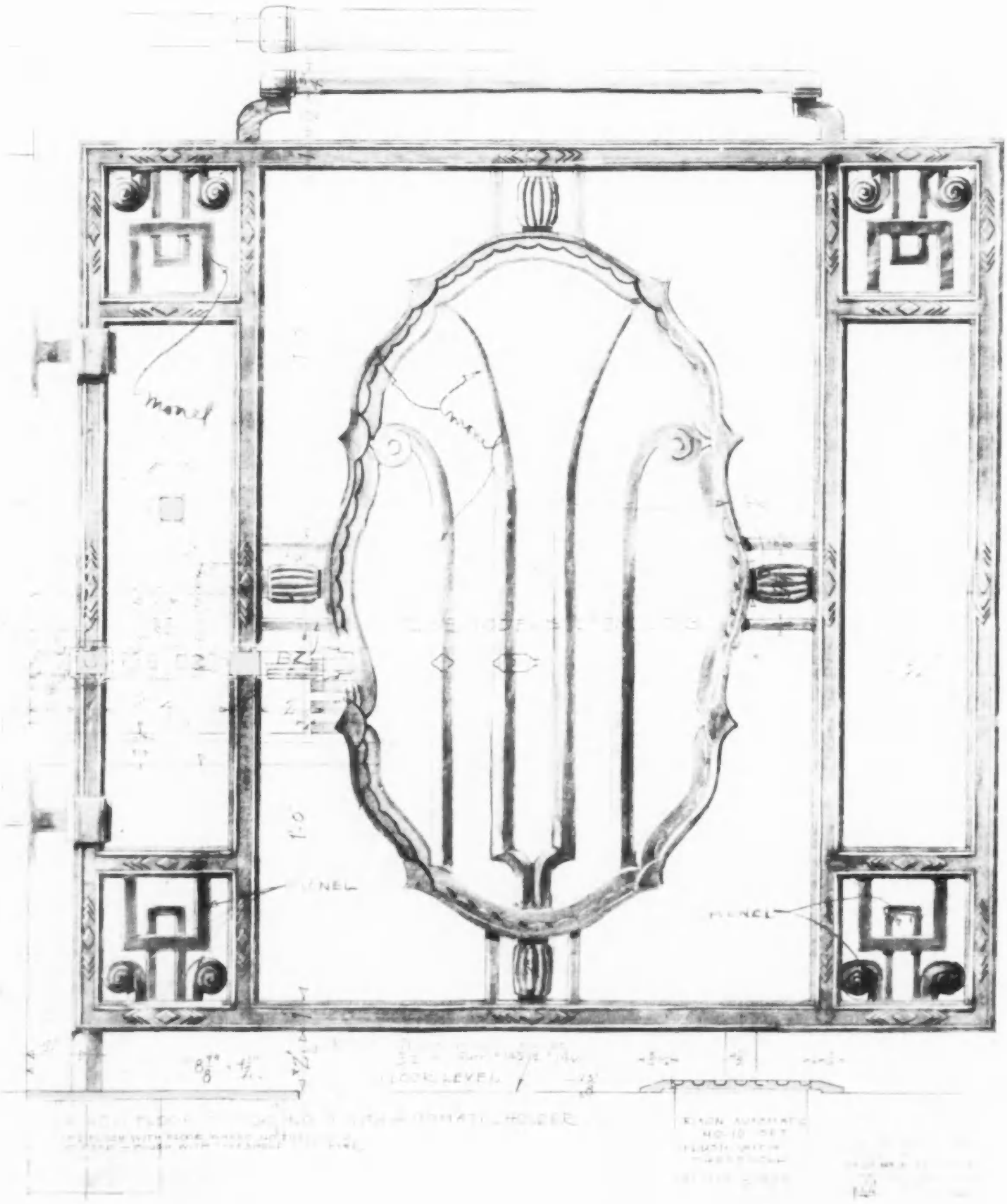
Detail of Grille
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT



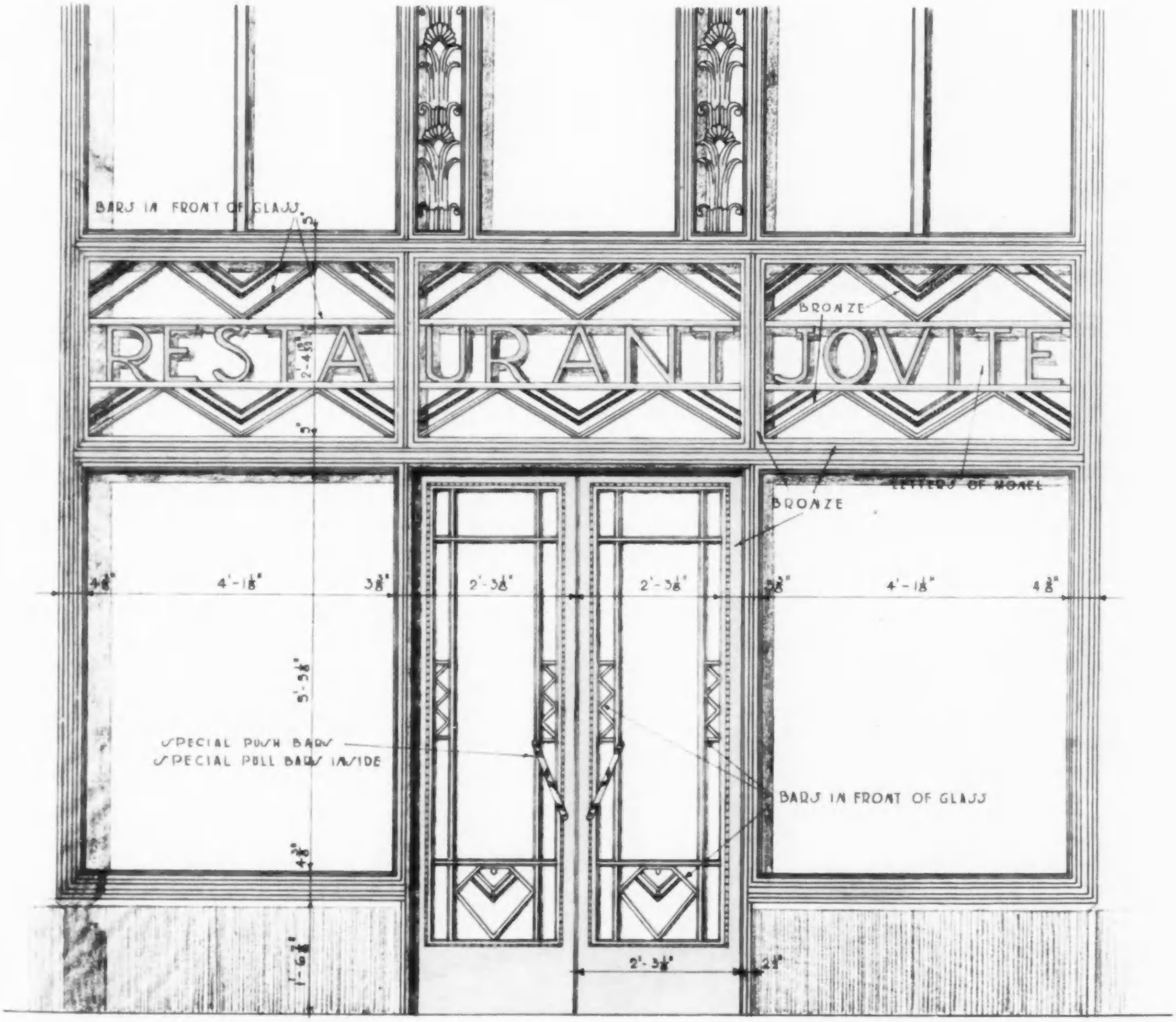
Early Study for Banking Room Grille
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT



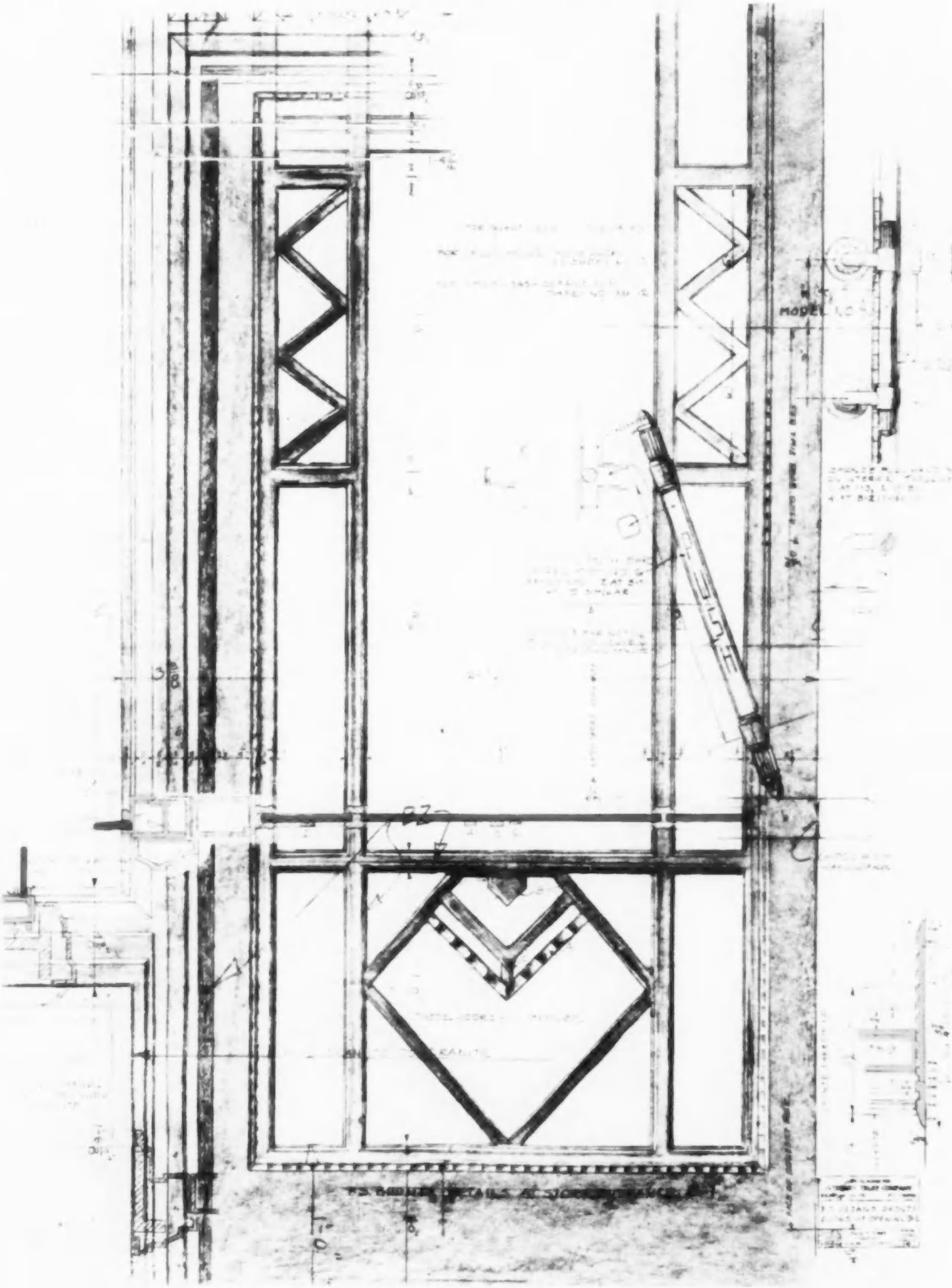
Study for Wall Treatment
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT



Typical Bronze and Monel Gate
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT



Bronze Façade of Restaurant Adjoining Bank
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT



Detail of Bronze Door
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT

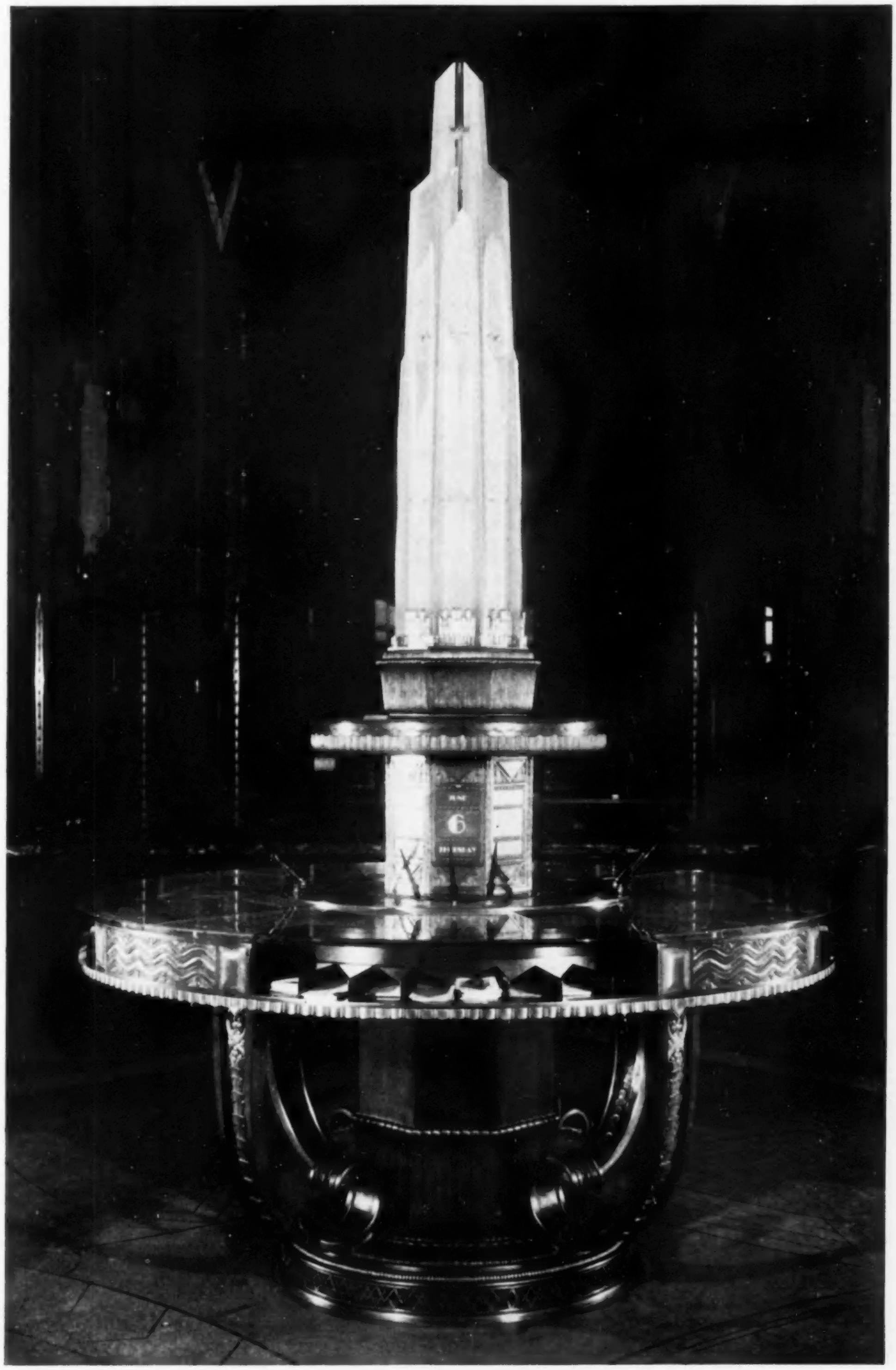


Photo. Dooner

CHECK DESK
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT

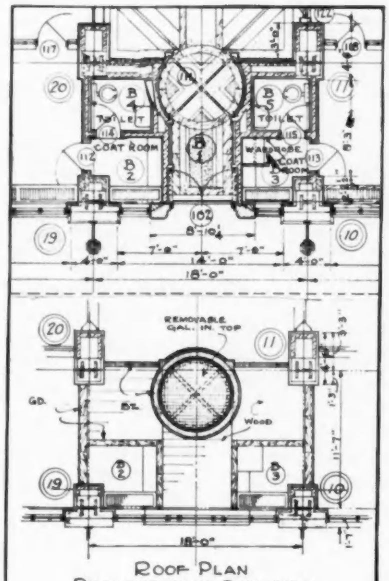
Photo. Dooner

VISTA OF STAIRS
INTEGRITY TRUST COMPANY, PHILADELPHIA
PAUL P. CRET, ARCHITECT

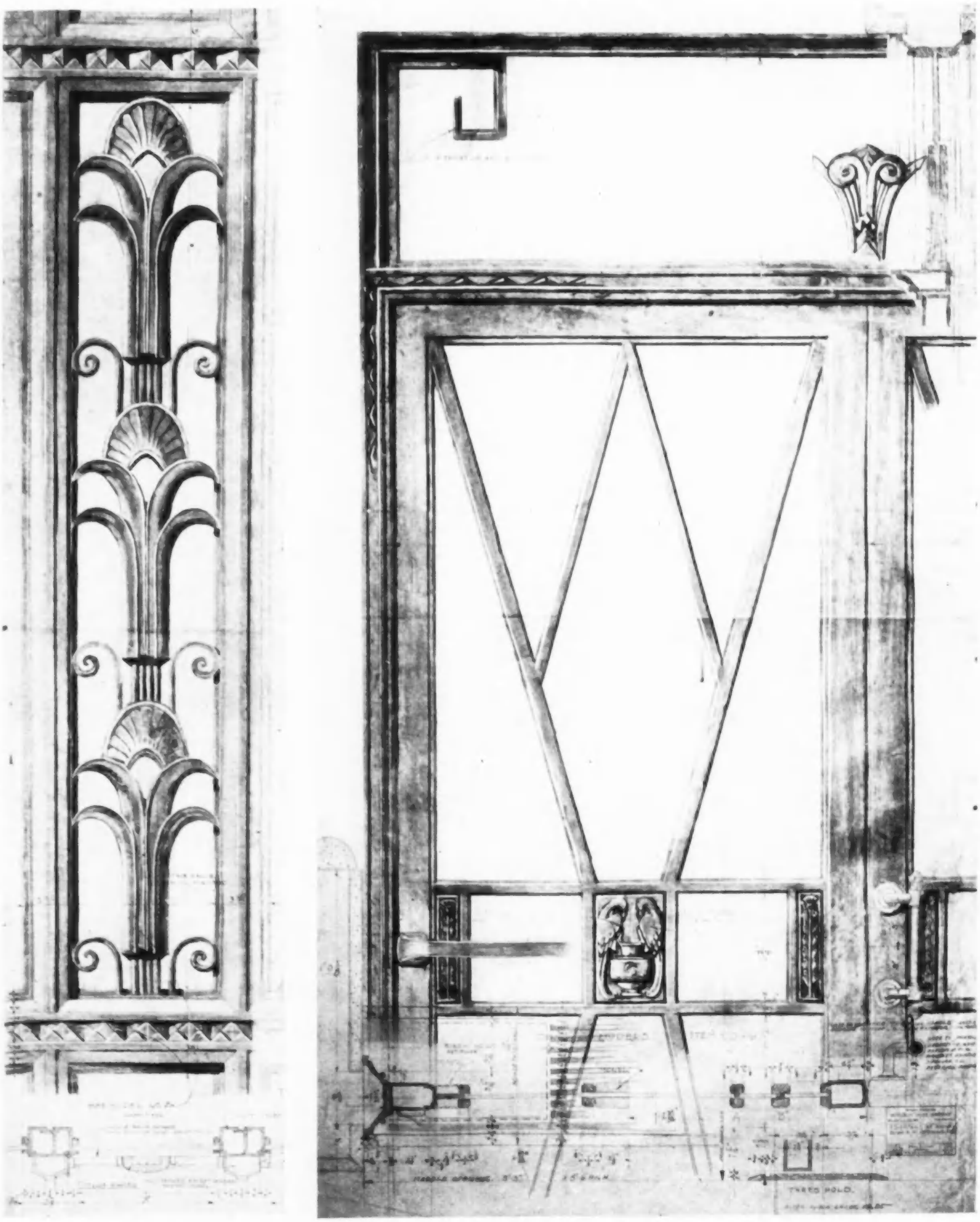
Photo. Dooner

REVOLVING DOOR

INTEGRITY TRUST COMPANY
PHILADELPHIA



DESIGNED BY
PAUL P. CRET,
ARCHITECT



WINDOW AND DOOR DETAILS IN BRONZE AND MONEL

INTEGRITY TRUST COMPANY, PHILADELPHIA

PAUL P. CRET, ARCHITECT

FILM CENTER

BUCHMAN AND KAHN, ARCHITECTS

LOCATION:

THE building is thirteen stories high, covering the entire block front from Forty-fourth to Forty-fifth street on the east side of Ninth Avenue, New York City. The first floor is arranged for stores. From the second floor up provisions have been made for housing film exchanges.

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PROGRAM:

The film exchanges operate all night, being busiest for a few hours after the theatres close, receiving returning films and preparing new shipments. To provide easily for this arrangement the major portion of the basement has been given up to receiving and shipping facilities. Ramps from the streets give access to a large loading platform in direct connection with the freight elevators so that as soon as cans of films are received they are placed immediately on the elevators and sent to the floor to which they belong. A mechanical ventilation system in the basement draws in exhaust gases underneath the platform and exhausts by a duct in one of the driveways.

•

FILM VAULTS:

Because of their highly explosive nature, the films are stored in vaults built in accordance with the most rigid requirements.

The vaults installed in this building are of two general types: those with independent vent flues leading through the entire building to the roof, and those venting through windows to the street. The simplest and most direct type of vault to build, because of departmental regulations, is the one with the vent flue leading to the roof.

•

VAULT CONSTRUCTION:

In this largest film exchange, with approximately 125 vaults, the first consideration of the city fire department was that with so many vent flues running to the top of the building there would be danger of an explosion in one vault communicating through broken vent flues to other vaults. It would be well, it was decided, to reduce the number of flues going to the roof and allow some vaults to vent directly on the street. The number of flues going to the roof can be seen on the twelfth floor plan.

The fire department regulations called for a vent of approximately 1600″ for a standard vault. The walls of the vaults could be 12″ block, 8″ brick or 6″ concrete. The 8″ brick walls, bonded into the concrete floor construction, were used because they were entirely satisfactory and more easily handled than concrete walls. Bottom arch floor construction was used for the ceilings with an extra fill on the floor above so that the cubic contents of the vault could be kept within limits.

The vaults are unheated. Very few vaults in New York are heated. The Cleveland Clinic disaster illustrates the possibility of troubles with heated vaults.

Twelve sprinkler heads were required for each vault with baffle boards separating them. Maintaining the regulation clearance between the contents of the vaults and the sprinkler heads, film racks were placed on the sides of the vaults. The top shelves can be reached easily in storing the film cans.

The sprinklers operate on the wet system and there is enough leakage of radiation through walls and doors which are open taking films in and out so that there is no danger of freezing.

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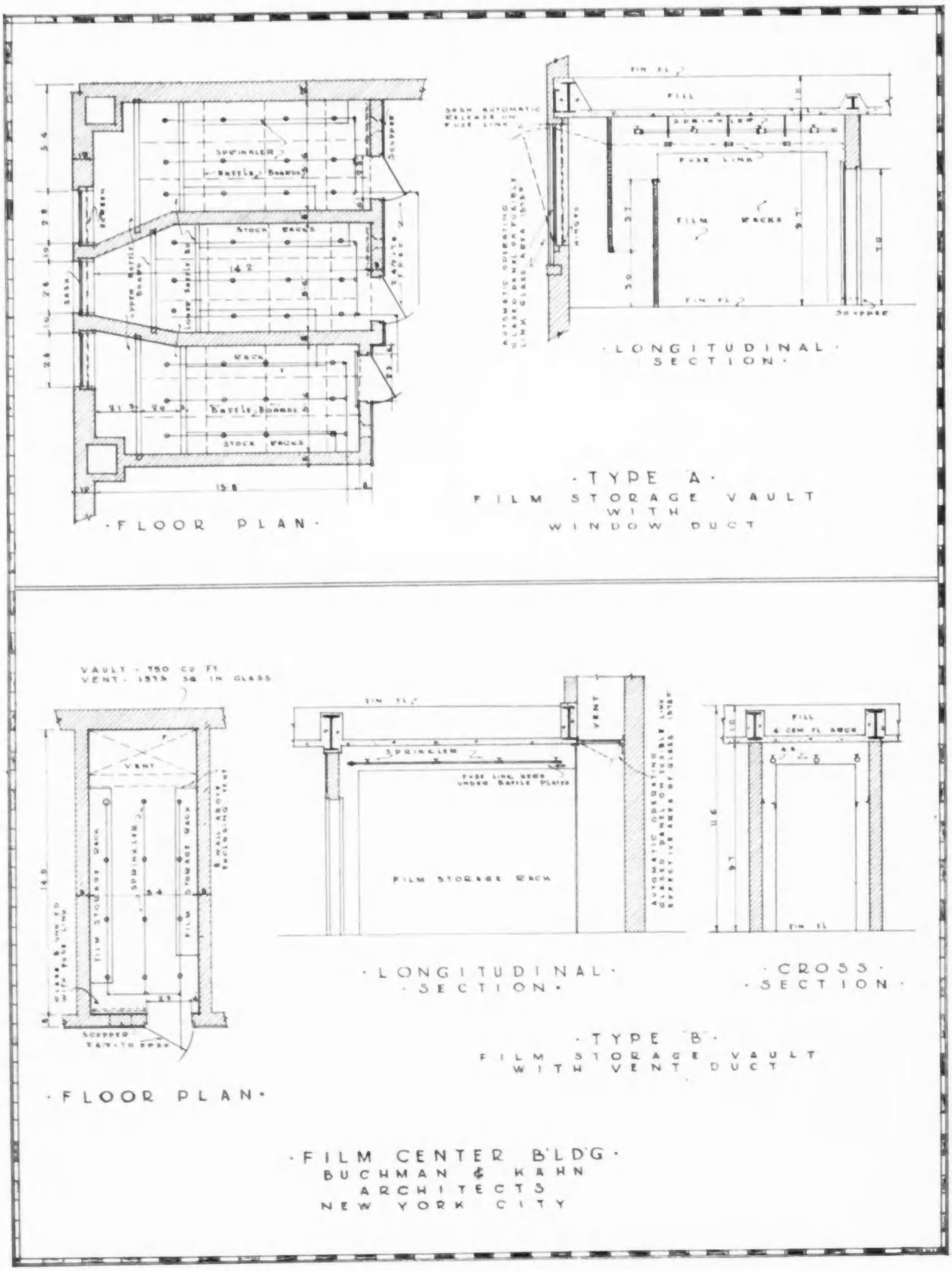
FIRE PREVENTION:

The vault sprinklers are separately valved. In the vents running to the roof there is a sash at the bottom with a fuse link



DETAILS OF FILM STORAGE VAULTS
SHOWING TWO TYPES OF DUCT CONSTRUCTION

Photo. Fischer

EXTERIOR VIEW
FILM CENTER BUILDING
BUCHMAN AND KAHN, ARCHITECTS

operation, the glass itself being only 1-16″ in thickness. In case of an explosion the glass is immediately shattered, releasing the pressure in the vault, the theory being that adjoining parts of the building will not be wrecked. In case of a fire the fuse link drops the sash allowing the flames and the heavy black film smoke to escape.

Inasmuch as there are inspection rooms for examining and repairing films, the building department required that such an exchange be filed under the labor law which requires windows to be self-closing in case of fire. In the film vaults venting directly on the street, the fire department and underwriters' regulations required that the window open in case of fire. The matter was studied, and it was decided that there should be a baffle wall installation, operating somewhat on the principle of a furnace. On this basis the windows of the vaults could properly be classified as vents only.

These window-vents also have 1-16″ glass, painted with an opaque paint to prevent transmission of heat from the sun to the vault. Iron hoods are placed around each of the window openings so that in an explosion the flame will project straight out and not be blown around into the adjoining vault windows. It is felt also that the baffle walls will give similar protection. Each vault is equipped with an automatic sliding fire door and an automatic swinging fire door and a scupper so that if the sprinkler heads go off the water can be taken care of. Floor drains were not used because some departments felt that there might be danger of communicating the explosion, even through the drain pipe, from one vault to another. If drains were actually to be installed it was felt each vault should have its own independent drain as well as its own independent flue.

•

SCHEME OF PLANNING:

Each floor provides for two major subdivisions, with groups of film vaults approximately symmetrically placed in the southeast and northeast sections of the building. The arrangement is flexible enough to permit divisions into small units. Naturally it will also accommodate single floor tenants.

The twelfth floor has a one-tenant arrangement, the layout of the Metro-Goldwyn-Mayer Film Company, whereas the seventh floor has two smaller tenants, the Holly Pictures Corporation and the First Division Corporation Pictures, at the same time leaving a block of space in the centre suitable for sub-division into units of one bay each. There are several such one-bay installations in the building, each with units consisting of a small shipping and inspection room and a general office.

The exchanges are generally quite similar in arrangement. Each has a general executive office with some sub-offices, an inspection room, a poster room, a projection and shipping room. The inspection rooms generally have from six to eight operators. Films returned from the theatres are rewound, and defects noted and corrected. The damaged film, cut from the reel, is dropped into the containers and stored under water until removed from the premises. Lights are of the vapor-proof type. The projection room is arranged as a miniature theatre in which buyers may inspect the film before placing their contracts. In the case of smaller exchanges, the projection room is a community venture.

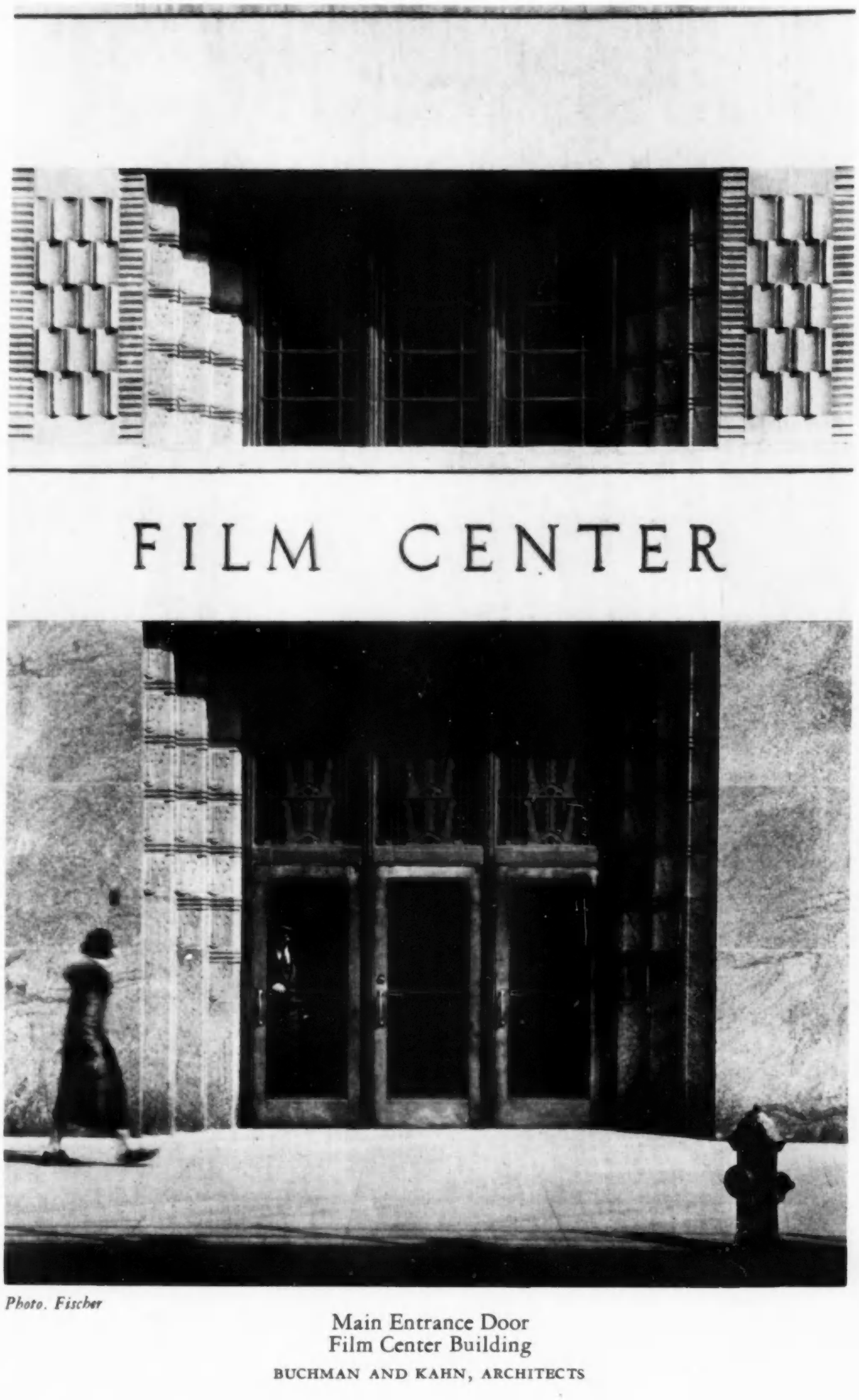
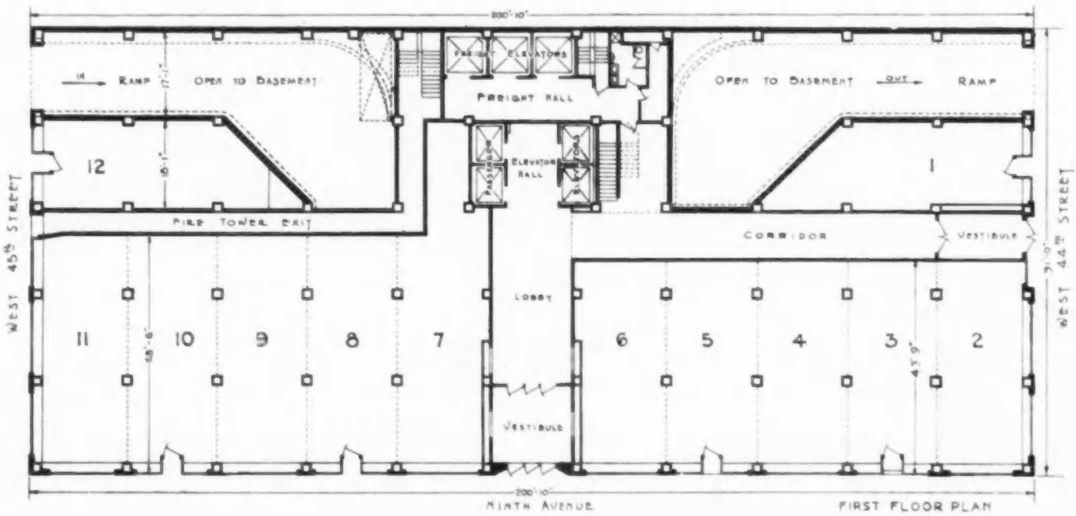
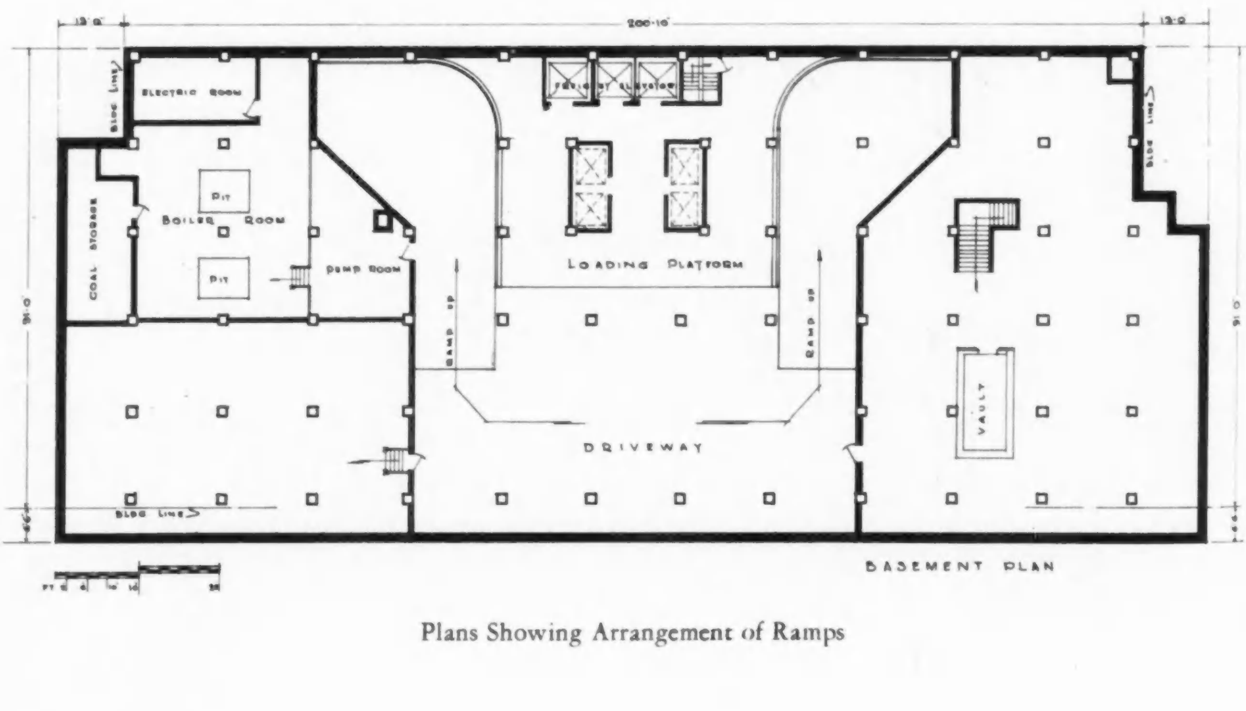


Photo. Fischer

Main Entrance Door
Film Center Building
BUCHMAN AND KAHN, ARCHITECTS

Film Center Building
BUCHMAN AND KAHN, ARCHITECTS

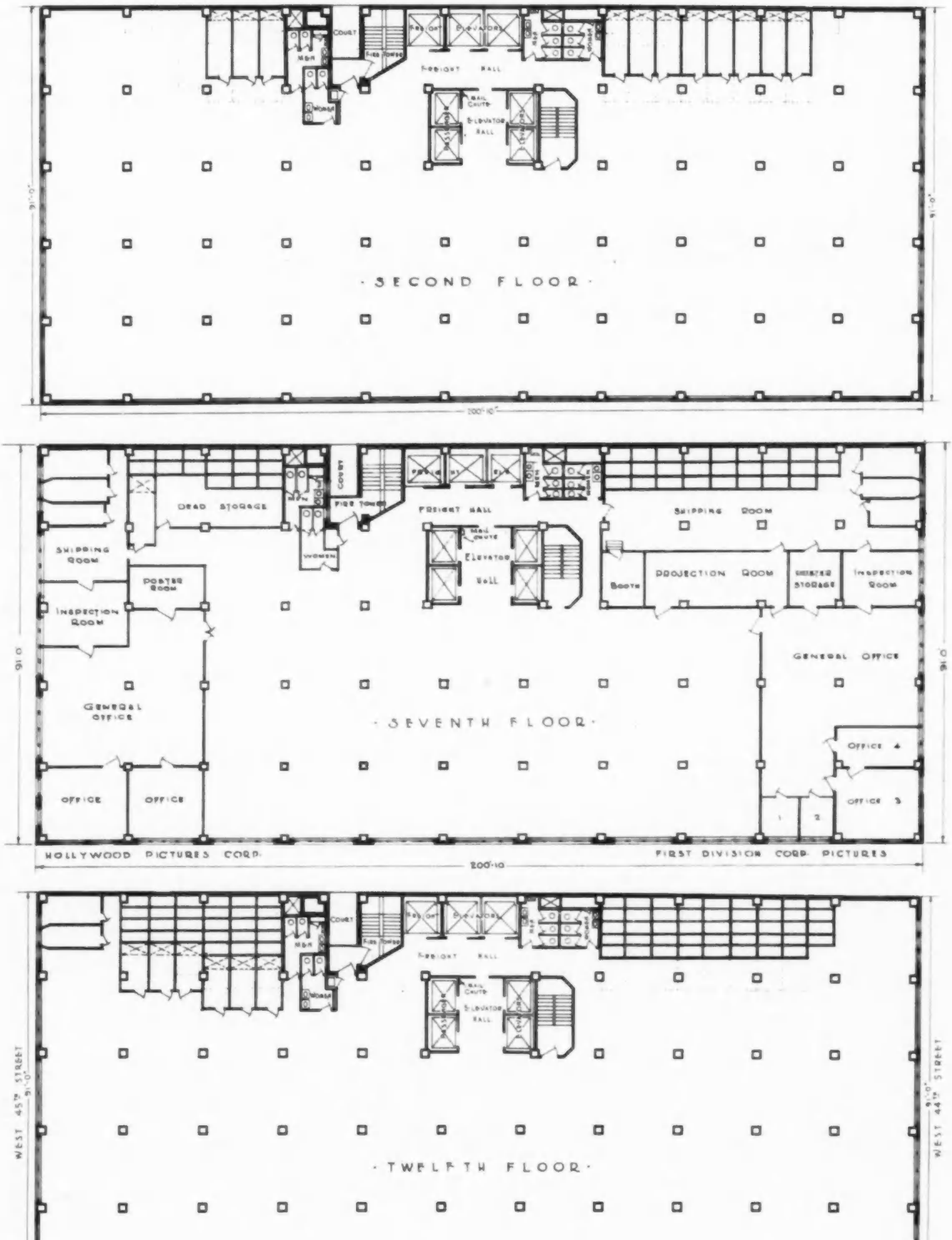




Plans Showing Arrangement of Ramps

Photo. Fischer

Detail at Top of Building
Film Center Building
BUCHMAN AND KAHN, ARCHITECTS



Film Center Building
BUCHMAN AND KAHN, ARCHITECTS

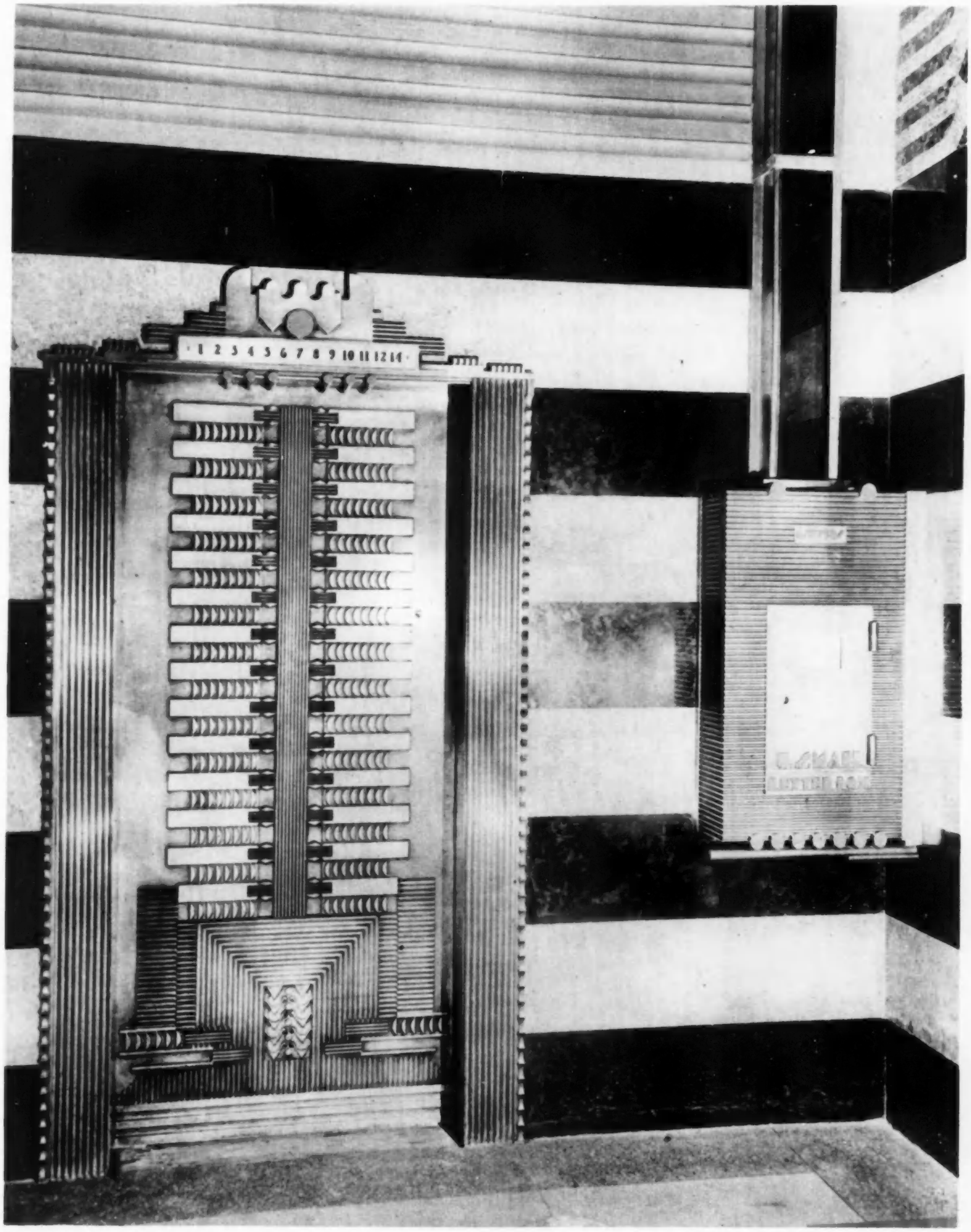


Photo. Fischer

Elevator Door, Main Lobby
Film Center Building
BUCHMAN AND KAHN, ARCHITECTS

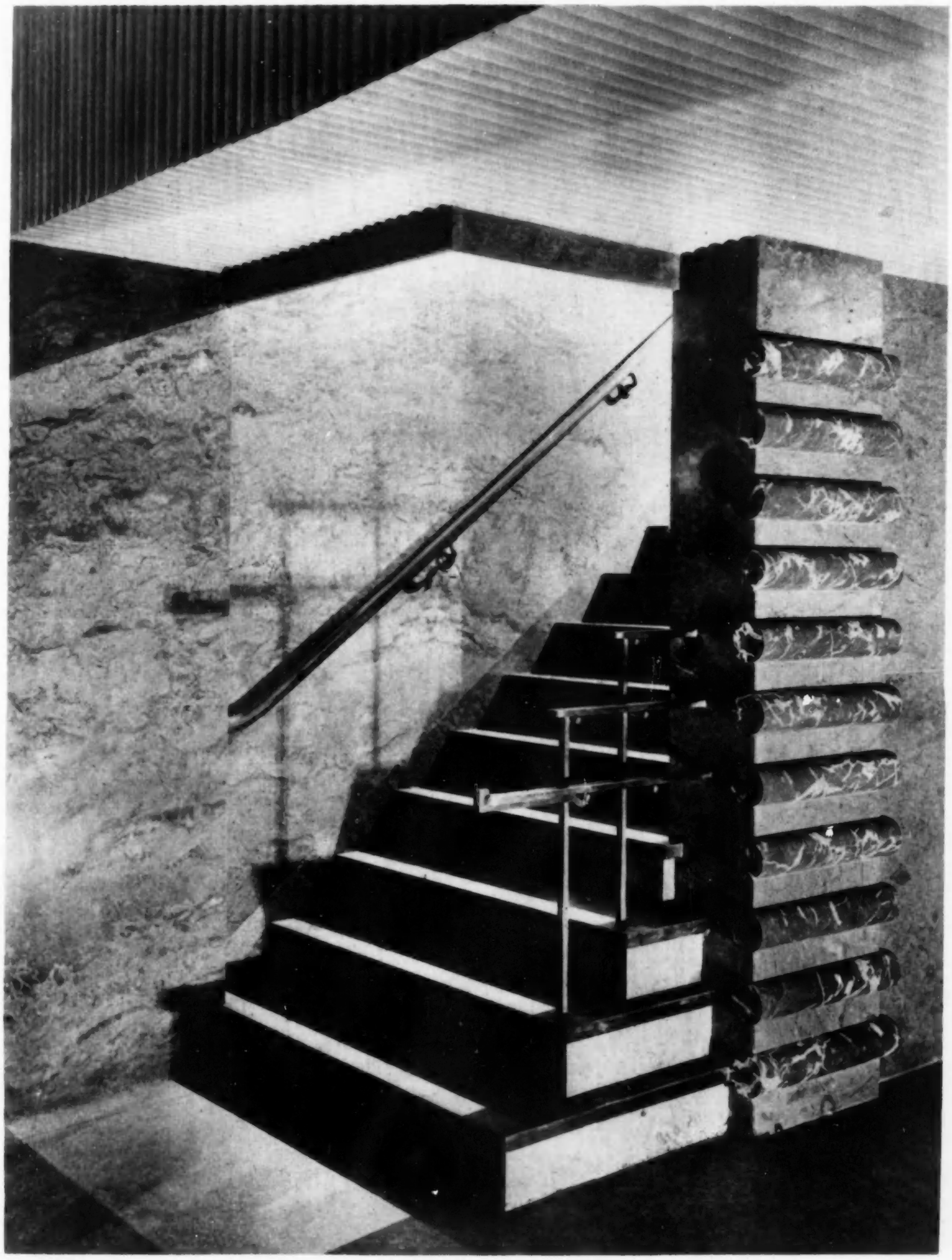


Photo. Fischer

Detail in Main Lobby
Film Center Building
BUCHMAN AND KAHN, ARCHITECTS

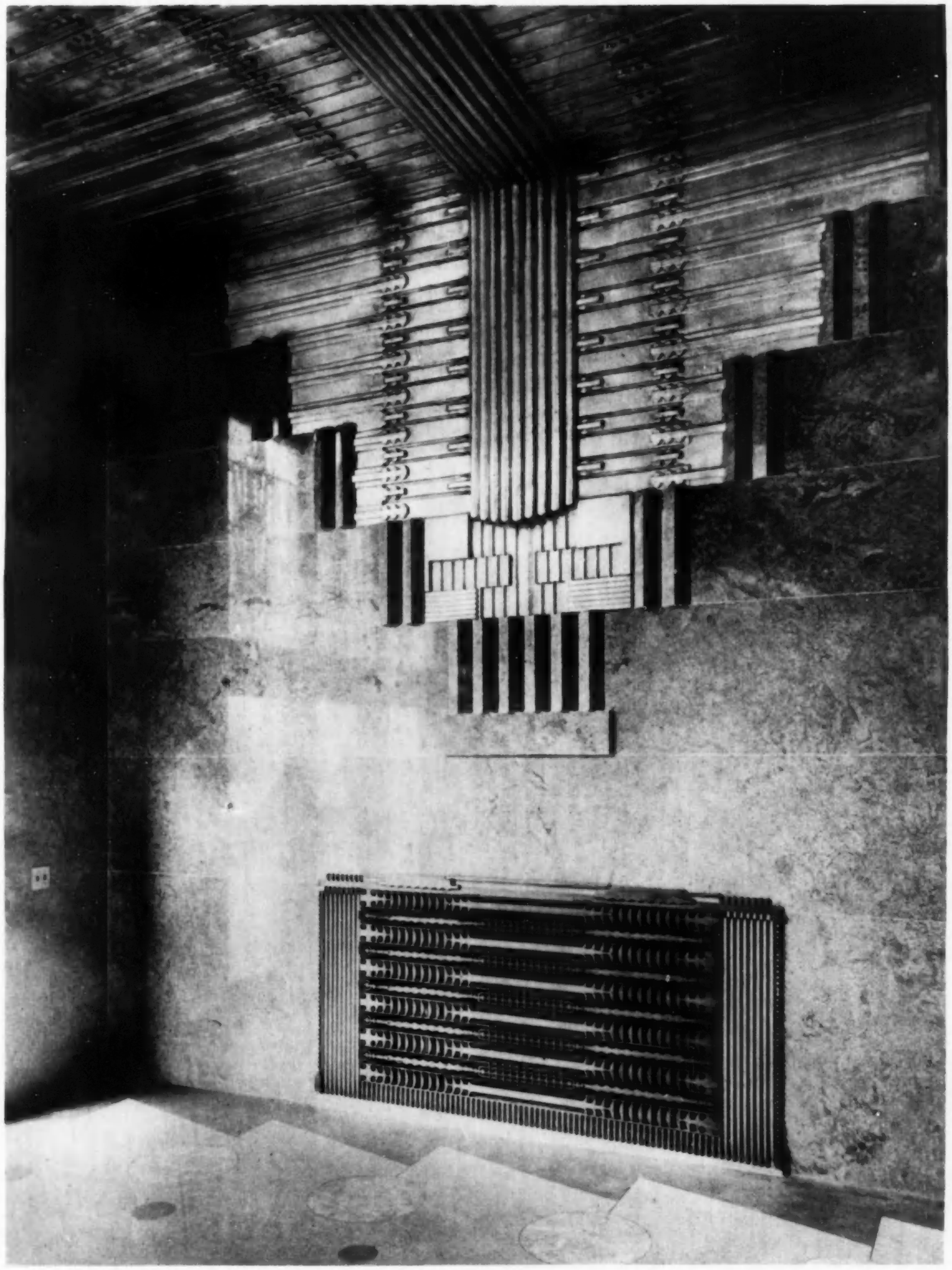


Photo. Fischer

Outer Vestibule
Film Center Building
BUCHMAN AND KAHN, ARCHITECTS

PORTFOLIO
OF
STONE TEXTURES AND LEADER HEADS

Photo, Wurts Brothers

Fitzgerald Residence at Flushing, N. Y.
J. OAKMAN, ARCHITECT

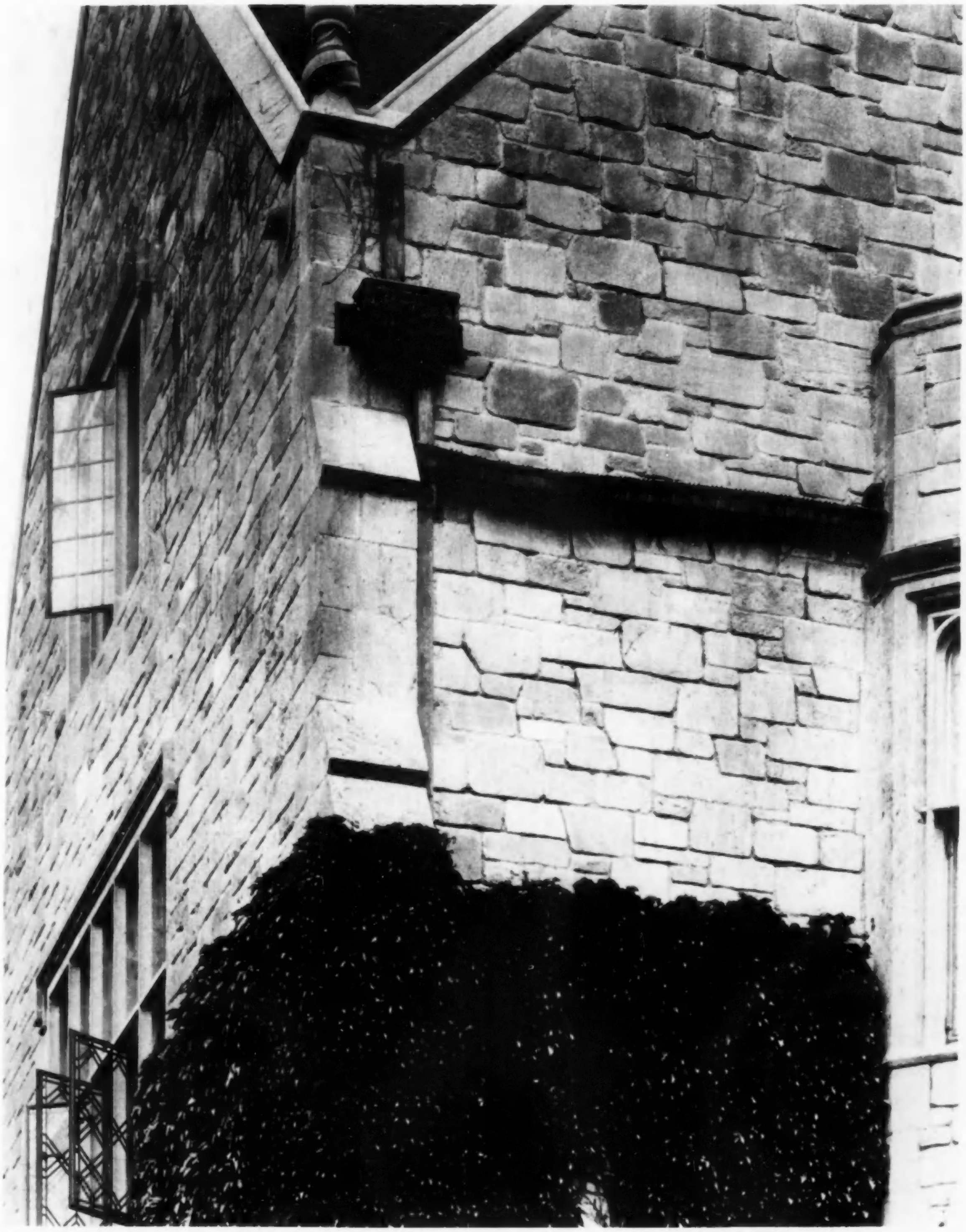


Photo. Wurts Brothers

House of W. R. Coe
Oyster Bay, Long Island
WALKER AND GILLETTE, ARCHITECTS

Photo. Wurts Brothers

Whitney Boat House
Manhasset Bay, Long Island
LAFARGE, WARREN AND CLARK, ARCHITECTS

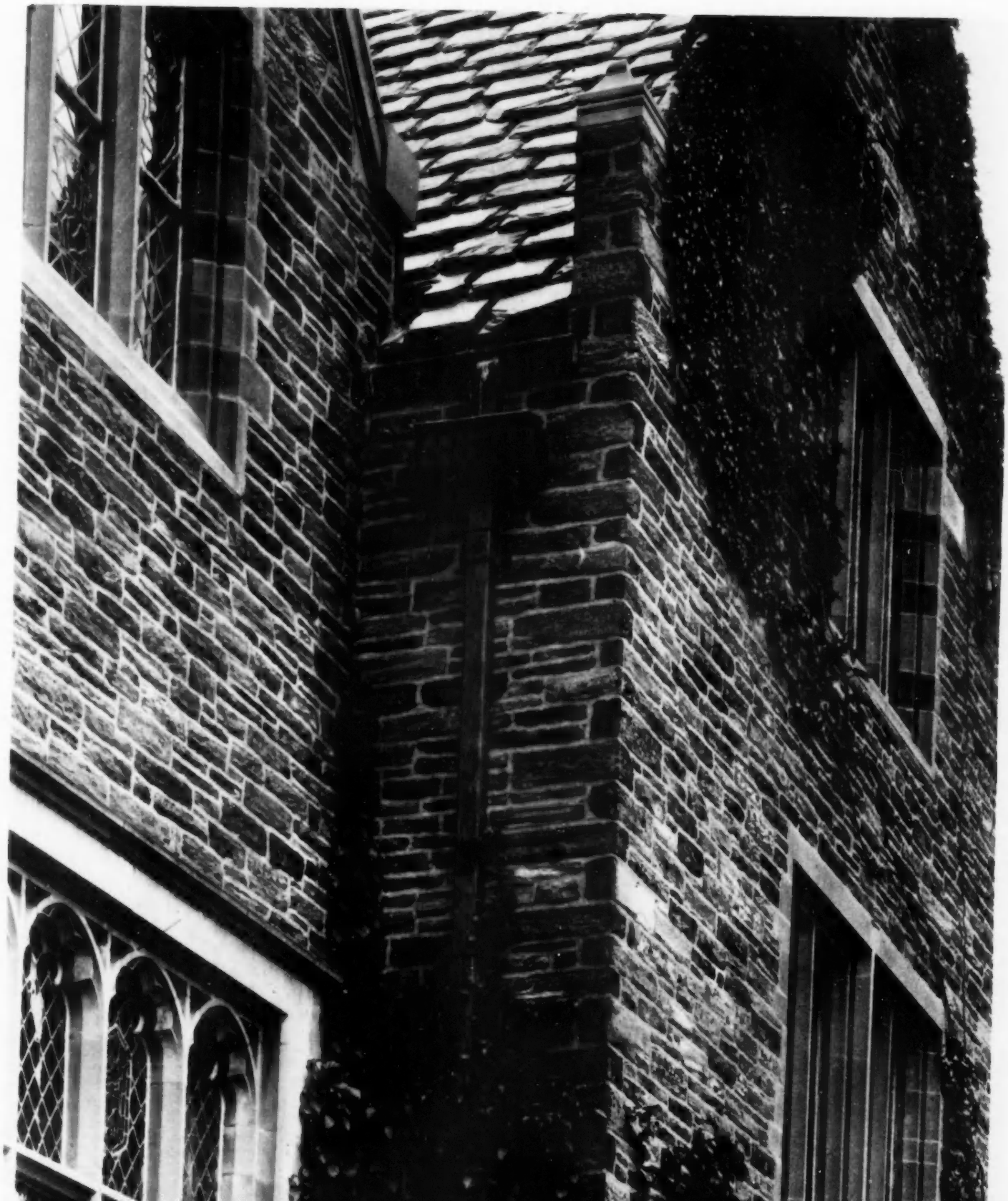


Photo. Wurts Brothers

House of Mrs. J. E. Aldred
Locust Valley, Long Island
BERTRAM G. GOODHUE, ARCHITECT

Photo. Wurts Brothers

House of Jacob Aron
Great Neck, Long Island
WALKER AND GILLETTE, ARCHITECTS

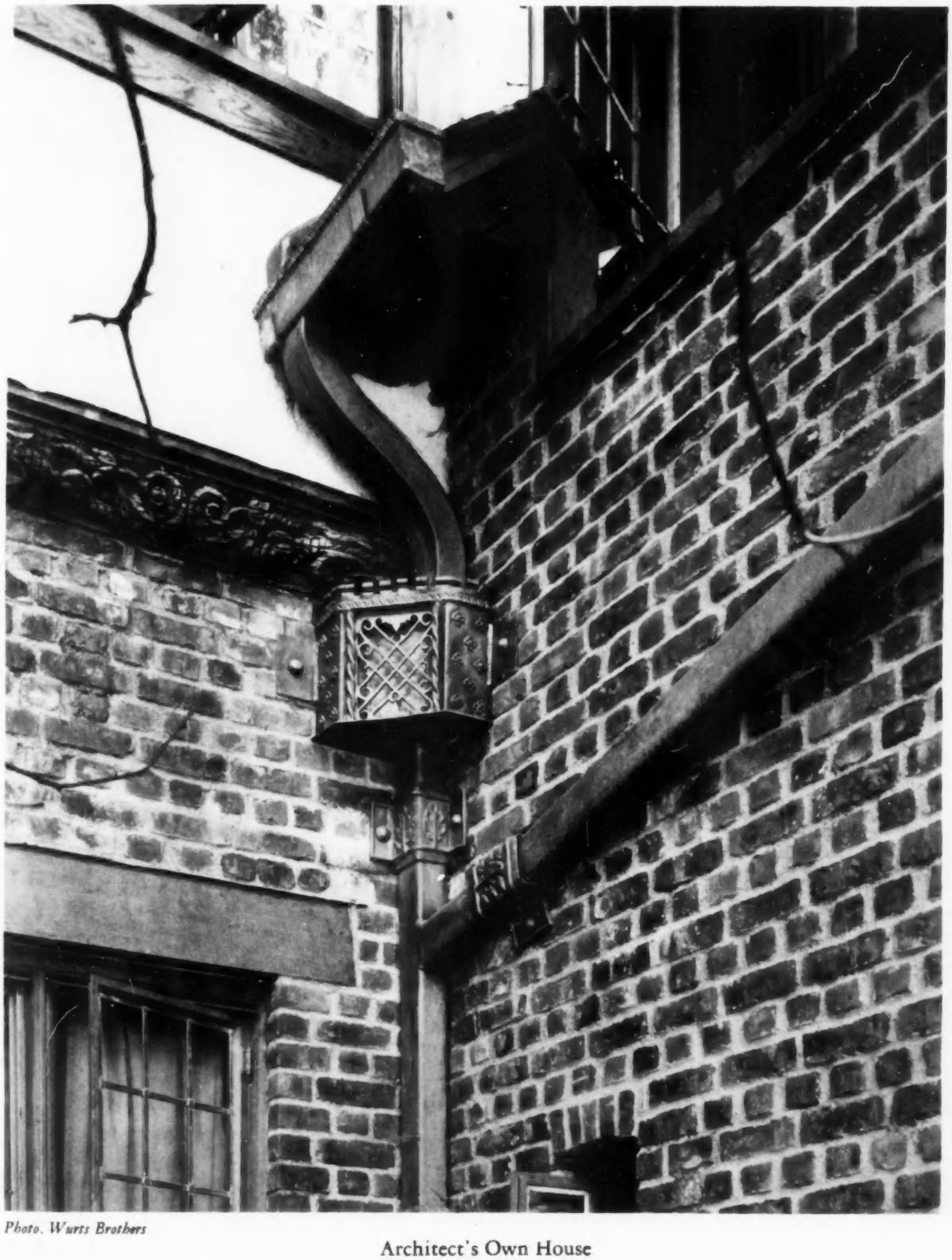


Photo. Wurts Brothers

Architect's Own House
Greenwich, Connecticut
J. N. PHELPS STOKES, ARCHITECT

PORTFOLIO
OF
SCANDINAVIAN BRICKWORK

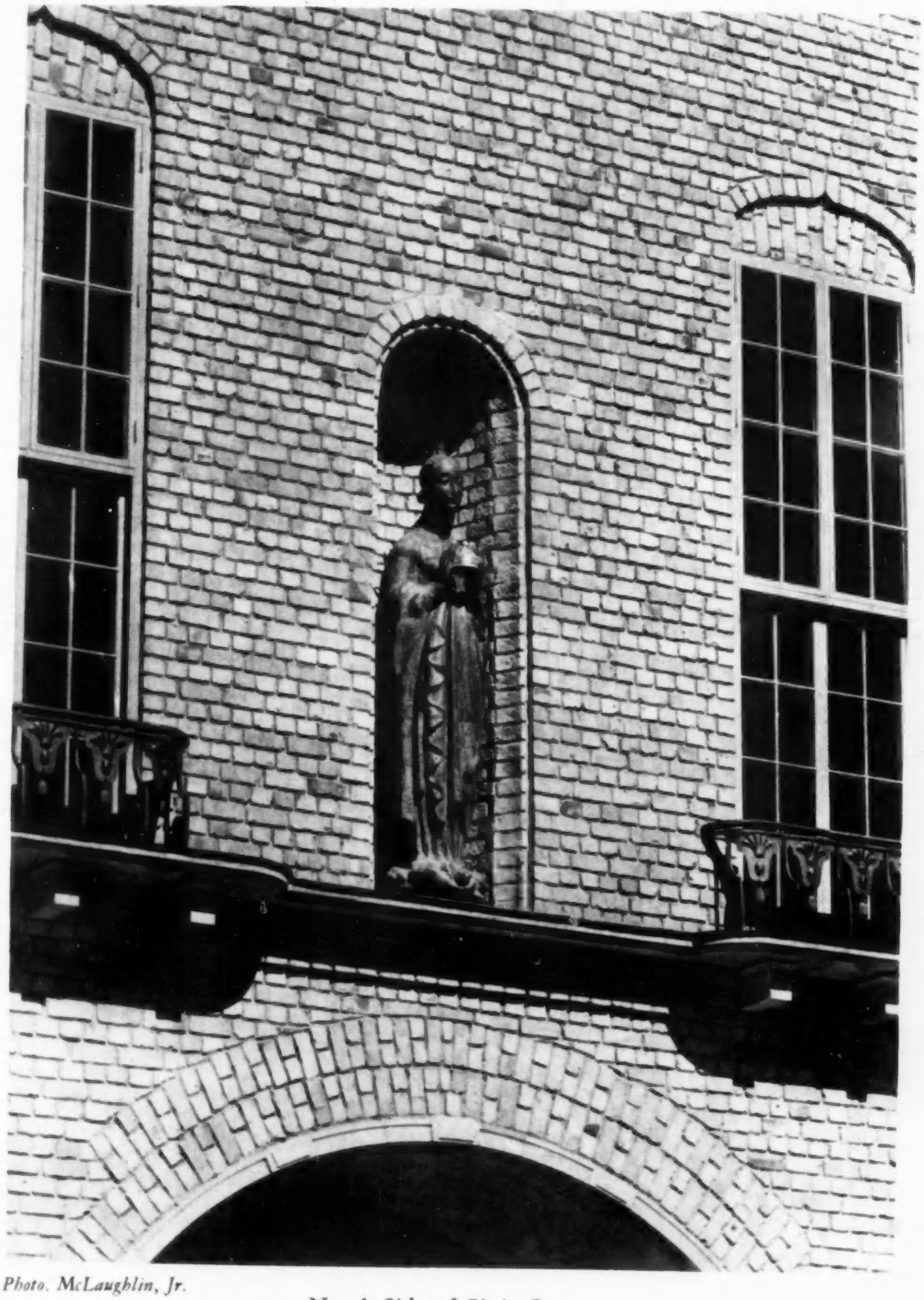


Photo. McLaughlin, Jr.

North Side of Civic Court
Town Hall, Stockholm
RAGNAR ÖSTBERG, ARCHITECT

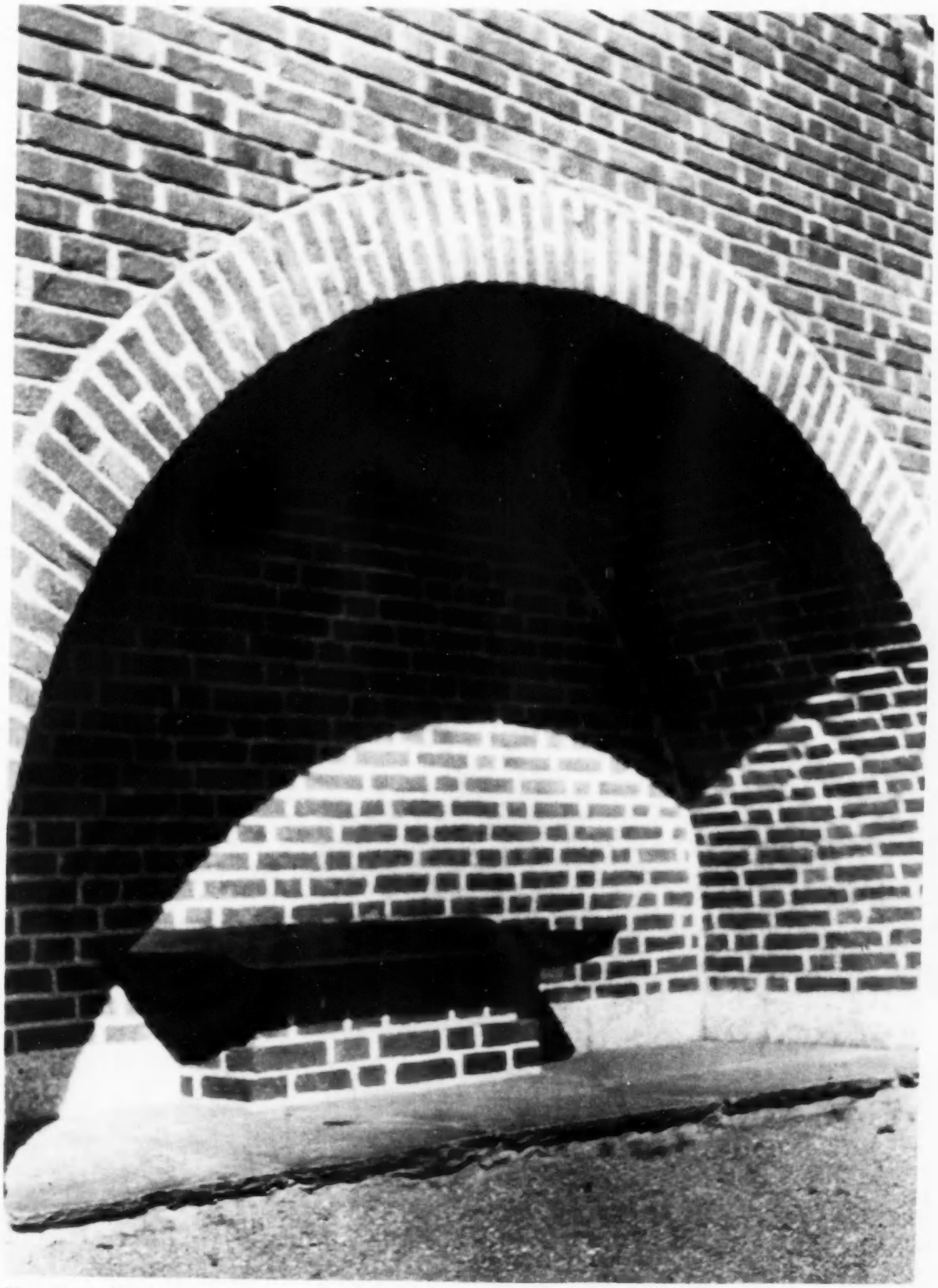


Photo. McLaughlin, Jr.

Community House, Stockholm
HAKON AHLBERG, ARCHITECT

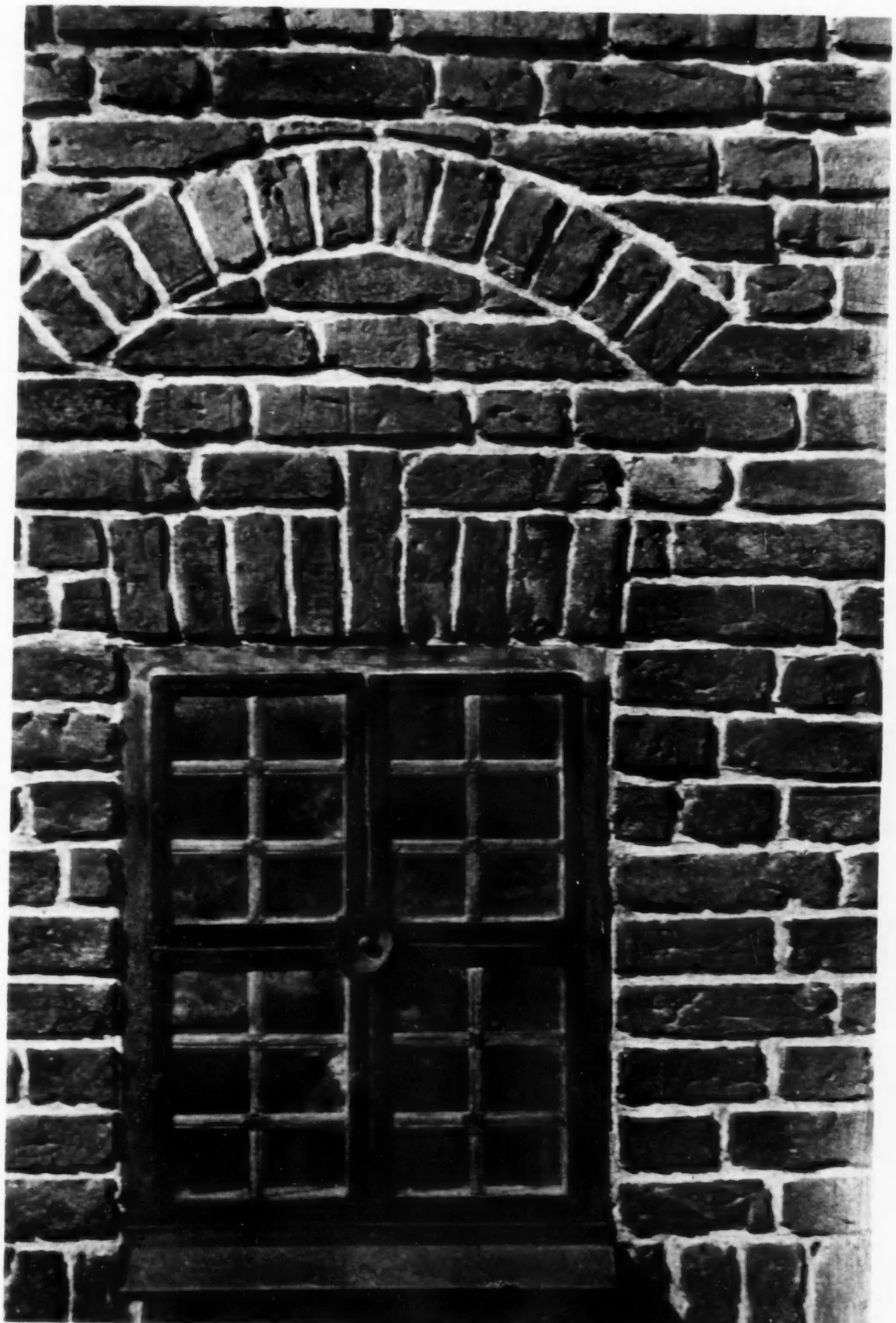
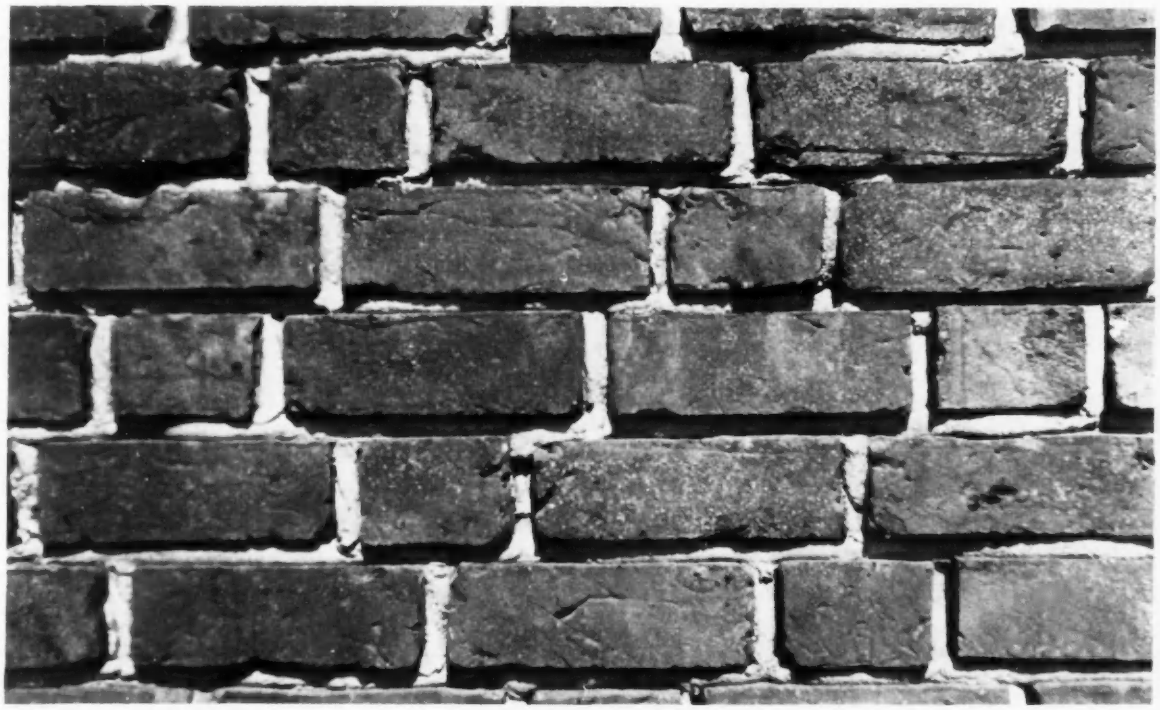


Photo. McLaughlin, Jr.

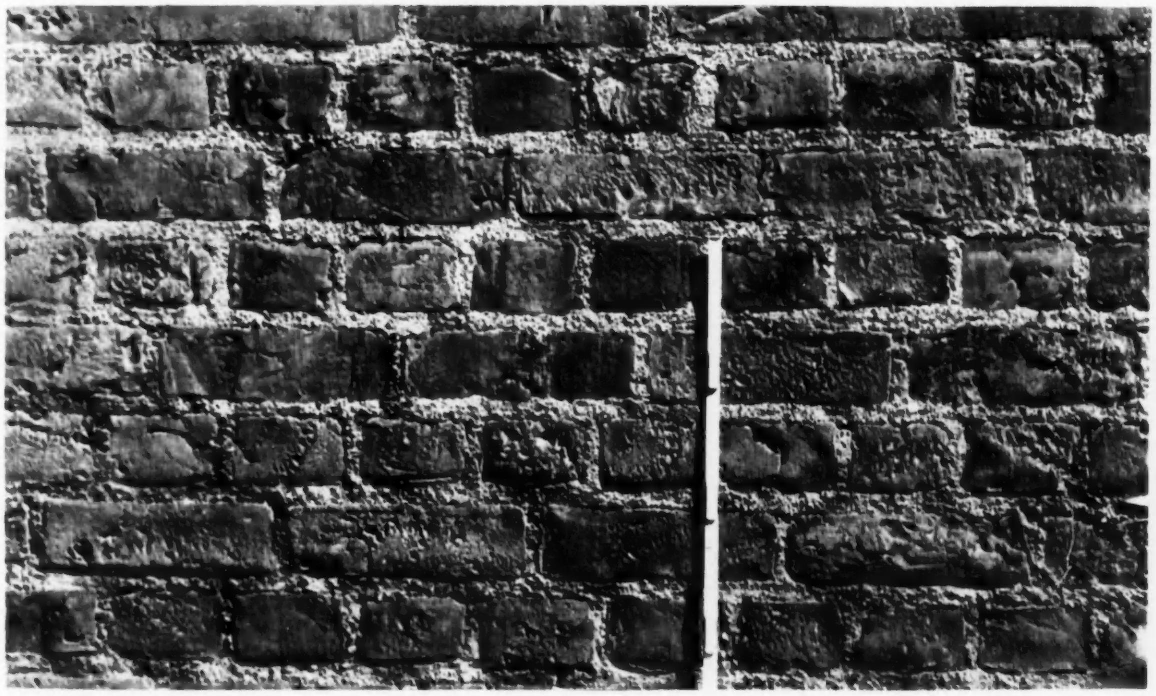
Högalidskyrkan, Stockholm
IVAR TENGBOM, ARCHITECT

Photo. McLaughlin, Jr.

Detail of South Facade
Town Hall, Stockholm
RAGNAR ÖSTBERG, ARCHITECT



Detail of Tower
Town Hall, Stockholm
RAGNAR OSTBERG, ARCHITECT



Photos. McLaughlin, Jr.

Brick Detail
Church at Copenhagen

SWEDISH BRICKWORK

PHOTOGRAPHS AND NOTES

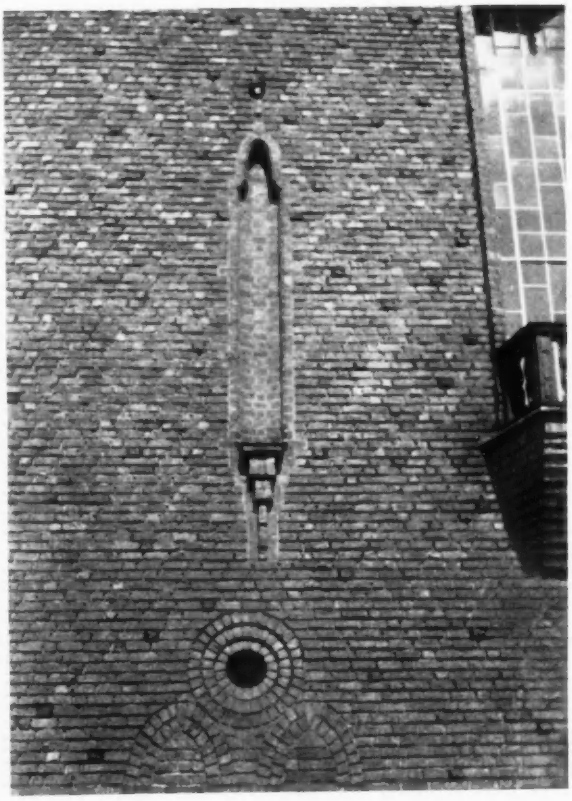
BY ROBERT W. McLAUGHLIN, JR.

THE absence of limestone and marble that will stand up under a rigid northern climate has been for Swedish architecture a beneficent limitation. Nowhere in the world is brick used with such a thorough regard for its qualities and such understanding of its possibilities. A northern Nero who would find a Stockholm of brick and replace it with marble would render no service to art. The usual objection that brick is not a monumental material is disproved in Scandinavia. The churches and the Town Hall of Stockholm and the great houses of the southern province of Scania are built of brick and certainly lack nothing of dignity and, where required, monumentality.

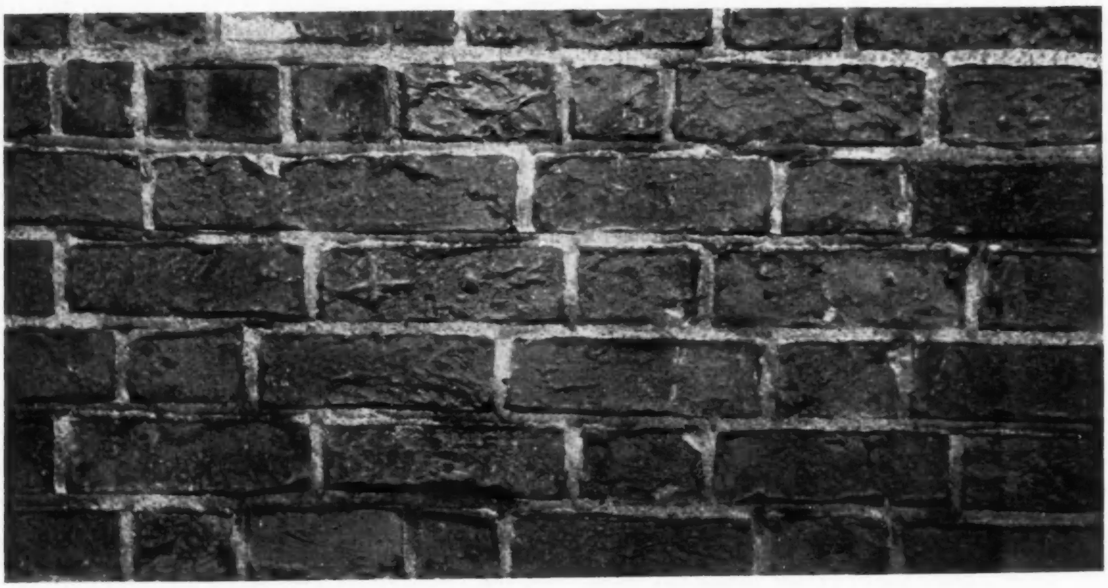

TOWN HALL, STOCKHOLM
RAGNAR ÖSTBERG, ARCHITECT

The Swedes seldom use the "trimmed" building. Brick is given its full dignity and no separating bands of marble and stone are interspersed in an effort to dress up the construction. Where cornices and sills are to be managed, copper is unobtrusively used. Water tables are avoided, resulting in a simplicity of surface. The Swedish brick is large, making photographs deceptive as to the apparent size of the building, but in execution affording a unit more weighty, both actually and apparently, than the brick to which we are accustomed. The effect of this larger size is one of greater dignity and importance. The brick in the Town Hall at Stockholm is 9.5 by 13 by 27 centimeters, or approximately 3¾ by 5⅛ by 10⅝ inches. It is laid up in courses of 11.5 centimeters, or about 4½ inches. The brick in Tengbom's Högalidskyrkan and in Ahlberg's Community House is slightly less squarish in shape, the latter being of stock size.

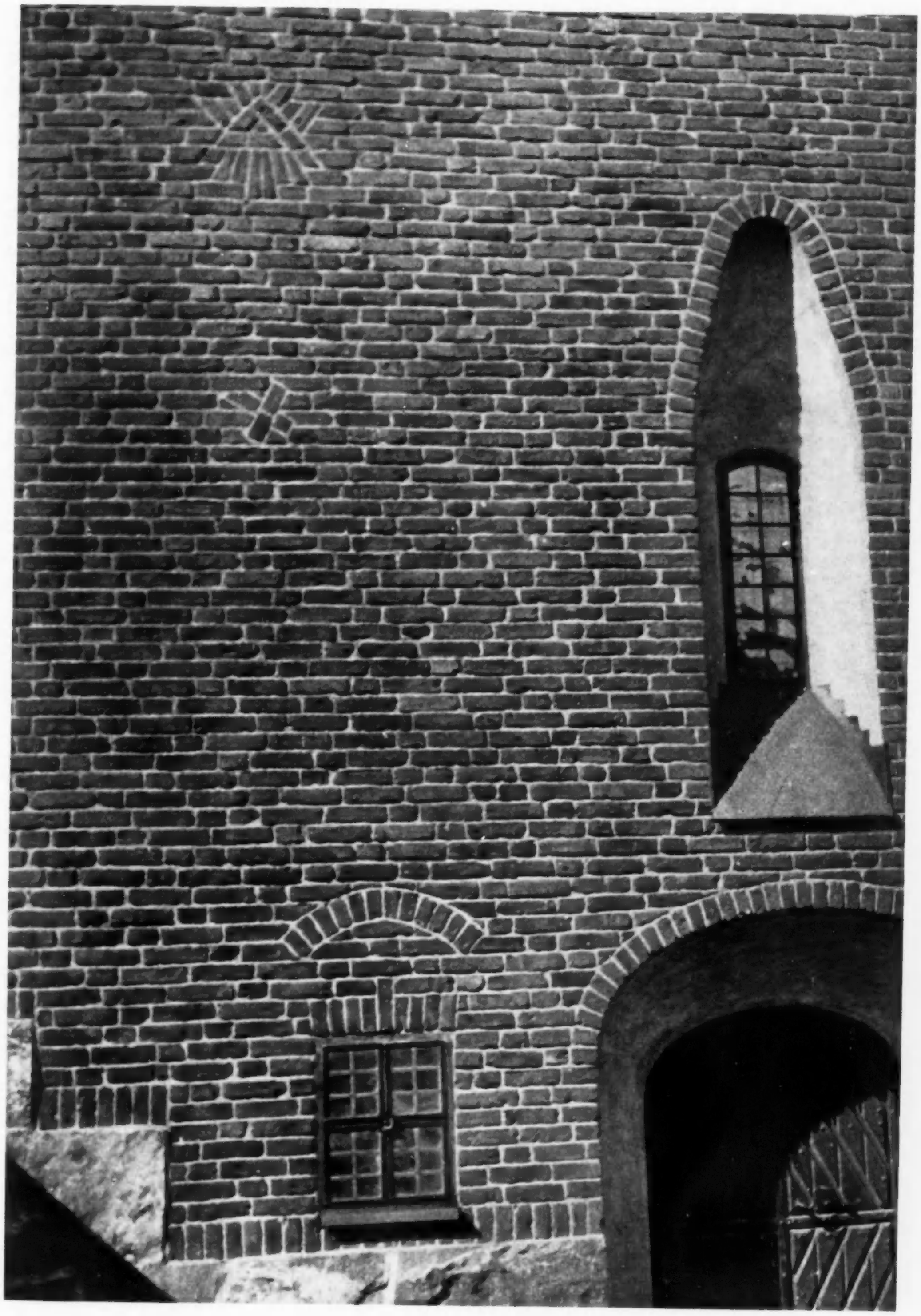
The brick on the external facades of the Town Hall is handmade, that on the interior court machine-made, both being modeled after a brick used by Gustavus Wasa in fortifications of the sixteenth century. The external facades are laid with two stretchers alternating with a single header. The headers center on either a stretcher or the joint between two stretchers above and below. The type of joint is varied according to the effect desired. In the tower a push joint with surface untouched by trowel is used, giving an effect of vigorous solidity where it is particularly desired. On the south facade immediately adjacent, the joint is flush where it meets the top of the



DETAILS OF BASE OF TOWER
TOWN HALL, STOCKHOLM
RAGNAR ÖSTBERG, ARCHITECT



BRICK BONDING
SKARHULT, SCANIA



HÖGALIDSKYRKAN, STOCKHOLM
IVAR TENGBOM, ARCHITECT

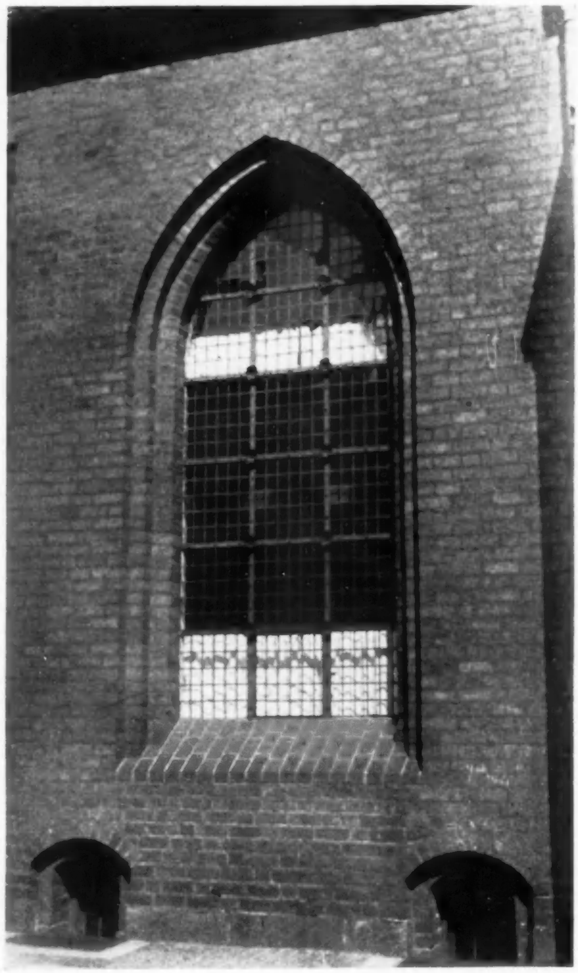
BRICK SURFACE CARVED AFTER WALL HAS BEEN BUILT
TOWN HALL, STOCKHOLM
RAGNAR ÖSTBERG, ARCHITECT

CARVED BRICK SURFACE
TOWN HALL, STOCKHOLM
RAGNAR ÖSTBERG, ARCHITECT

brick, and slightly struck upwards. Thus a small shadow is secured while the sense of surface in the wall is maintained intact. One might also note here a further means of emphasizing the unbroken wall surface by an avoidance of verticals which are produced when openings are consciously centered one above the other.

A finer sense of scale, compatible with the interior court, is secured by using an English cross or Dutch bond which affords a larger display of headers and a consequent diminishing of scale. The two bonds so far mentioned are those customary in Sweden.

Almost no molded brick is used. Bricks are clipped on the job where necessary and the resultant discrepancies taken up in the joint. A great deal of work is done by the mason after a wall is laid in carving the brick with chisel and hammer to secure a niche or molding where desired, thus attaining a sense of solidity in the wall. The little niche in the south facade of the Town Hall is an example of this. The entire surface of the walls of the Blue Hall was carved after the brick was in place.



ST. NICOLAI KIRKE, COPENHAGEN

The walls of Tengbom's Högalidskyrkan are fine examples of brick. The bond so frequently used in Sweden is here worked with consummated artistry. One should note the diagonals that this bond gives, better in scale with a large surface than is the comparable pattern of Flemish bond. These diagonals are broken with the interspersion of an occasional extra stretcher, so as not to run the eye off the wall. Actually the unsearching eye does not see these diagonals, but they serve, subconsciously at least, to knit the wall surface together. The size of the Swedish brick and the bonds in which it is worked are well adapted for use in the large surfaces that we so often have in this country.

Photo. Dreyer

MUNICIPAL EMPLOYMENT BUREAU
A. E. RIGG
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CAN ARCHITECTURE BE TAUGHT?

R. L. DUFFUS

No, the layman is tempted to answer. In the bewildering variety of the knowledge its practitioners must have, architecture is comparable to only one other profession, medicine. It is a business, a science and an art. How is an instructor to train a student to ride these three horses at once? How can he maintain a correct and expedient balance?

Yet this complexity of problems is making architecture a characteristic and successful form of self-expression. The architect and his teacher have not only a Herculean labor to perform, they have also the thrill of opportunity. They are asked to take the two main impulses of our national life, money-making and the search for scientific facts, and blend them with a third, the yearning for beauty. If any one is to achieve this synthesis it must be the architect.

In *The American Renaissance* I recently tried to assay the possibilities for American art by examining the practices and policies of the art schools. The method was fallible because not all artists go to art schools and some artists who do go succeed only after they have forgotten all they learned. But even those critics who maintain that the best artists are self-taught will not assert as much for architects. That which lifts any creative worker in any occupation out of the crowd must be in some measure inborn or self-acquired. So much may be conceded. But no one becomes an architect by sitting, Hindu fashion, at the mouth of a cave and contemplating. He must stir about and acquire a fund of knowledge. He must submit himself to discipline in his instruction because he must submit himself to discipline in his practice—a discipline made up of stresses, strains and thrusts, the obstinacy of materials and foolish clients.

Any number of teachers of painting believe that they get the best results when they leave the student mostly to his own devices. They throw him into the pool of art. If he is good, he swims. If he is not, he sinks and good riddance.

Architecture clearly cannot be taught in this way. It must be taught systematically or it will not be taught at all. It is an art —perhaps the sum of all the arts—but it rests on a solid basis of information and experience. The architect's head is often in the clouds but his feet are, or should be, on bedrock. Floating foundations will not do.

Teachers of architecture have had to think about their work in more precise terms than teachers of the other arts. They have been compelled moreover to adapt these terms to changing conditions. The use of rolled steel shapes in this country is less than half a century old, yet it has turned a large part of architectural practice wrong side out. Our monumental buildings no longer are held up by the stones, bricks or cement surfaces that meet the eye. These are often no more than a kind of garment, a drapery whose lines of strength are an illusion. If the old orders of architecture survive they are imposed upon new orders of construction. The schools must prepare their students to wrestle with the resulting problems. They must teach them to combine long-established principles of aesthetics with modern principles of engineering.

No such transformation has taken place in painting or in music. Modernism in these fields has consisted merely of re-combining and re-emphasizing old elements. Consequently traditions, good and bad, have a stronger hold in the teaching of painting and music than in the teaching of architecture. Of the two, music has a closer affinity with architecture, perhaps because both rest on a basis of mathematics.

Among students of painting we find the most lavish display of "temperament," though the degree to which this is indulged varies with the school and the instructor. The temperamental artist can often work only in his own way and at his own time. But temperament in the architectural school and in the drafting room must be under control. Otherwise the new buildings will not be economical nor serve their purposes, and may not even hold together.

The tendency for the past few decades in the leading schools of architecture has been toward a lengthening of the course and the inclusion of more non-technical subjects. In the minutes of the Association of Collegiate Schools of Architecture one finds this theme recurring frequently. First is the effort to increase instruction in the general field of the fine arts. Then, as the belief gains ground that the apprentice architect requires at least five years, and perhaps as many as six or seven years of formal schooling, the demand for a broad academic foundation grows.

"The School of Architecture," says an announcement from Harvard University, "developed into a graduate school because of the very general feeling in the profession that an architect should have, if possible, a liberal education as a basis and background for professional studies. The architect needs business ability and integrity on account of the huge sums of money entrusted to his care. He needs ingenuity and scientific knowledge to plan buildings conveniently and to construct them safely and economically. Still more does he need artistic imagination enriched by knowledge of the great art of the past, combined with knowledge of the needs of today and of the materials and methods now available for expressing those needs. Few fields of knowledge are without interest to him—art, science, history, languages, law and finance all touch his work. A profession which requires or allows a range of interest from plumbing and heating to painting and sculpture, from the niceties of craftsmanship in wood and iron to the engineering of a skyscraper, has an ever-varying interest to any active mind." The architectural faculty of the University of Michigan believes that "literature, science, business administration, economics, philosophy and kindred subjects are invaluable and should receive attention throughout the collegiate period." These are representative opinions of the best schools.

They bring out another distinction between the student of architecture and the student of the other fine arts, and between the teaching of architecture and that of the other fine arts. Almost any teacher of painting who is not also an architect will say that the earlier the age at which his student can begin his technical training the better. One finds students with high school certificates admitted to practically all art schools and students who have not finished high school admitted to many. In the art school these beginners usually receive little or no general education. Even at the Chicago Art Institute a few years ago a course in the history of art was introduced with misgivings and at first against the vehement protests of the students. Where architecture is taught as a division of a professional art school the same situation may prevail. But the collegiate student of architecture must usually wait at least two years for his serious technical training. At Harvard he must wait until he has attained his bachelor's degree, when he comes at last to his professional problems with some maturity and perspective.

Often, as at Yale and the University of Pennsylvania, instruction in architecture is grouped with painting and sculpture in a school of fine arts with an architect at the head. Such men naturally refuse to make a sharp distinction between the educational background which is good for architects and that which is good for painters and sculptors. One finds them working out what is really a new species of art education—a type of training which prepares the artist to mingle in the world rather than keep himself aloof. Time alone can tell just how successfully the aspiring painter or sculptor

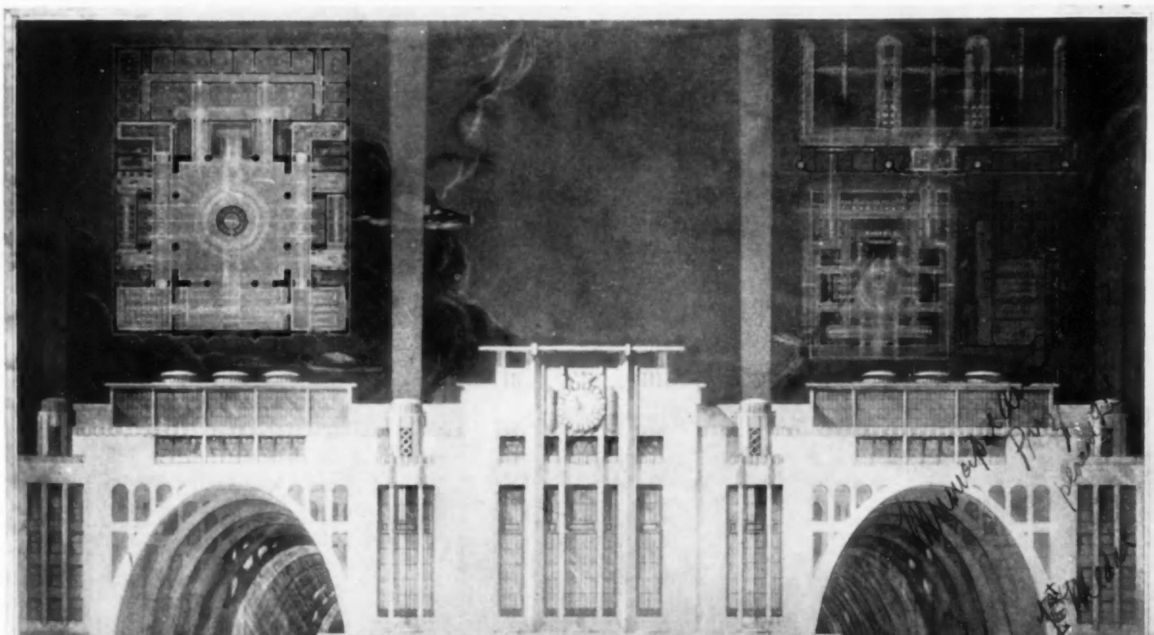


Photo. Dreyer

AN AIR TRANSPORT TERMINAL
T. MATSUMOTO
HARVARD SCHOOL OF ARCHITECTURE

can be bent to this scheme, or how well the collegiate schools can hold their own in the inevitable struggle with independent art schools. But it is pleasant to hope that the result of these modern tendencies toward unity in the teaching of the arts will be a greater unity in practice.

In the Renaissance the arts were one and da Vinci, Cellini and Michelangelo could pass easily from one phase to another. Such facility is out of tune with the modern tendency toward specialization and with the complexity of modern life. But we can substitute for it a teamwork both modern and American. This, as every one doubtless knows, is one of the guiding policies of the American Academy at Rome. A sculptor, a painter, a landscape designer and an architect are given a problem to solve together. Each must work with the tasks of the other in mind. There is no reason why our great buildings, and eventually even our cities, should not also be the products of an aesthetic co-operation. But educators must first foresee this and then prepare.

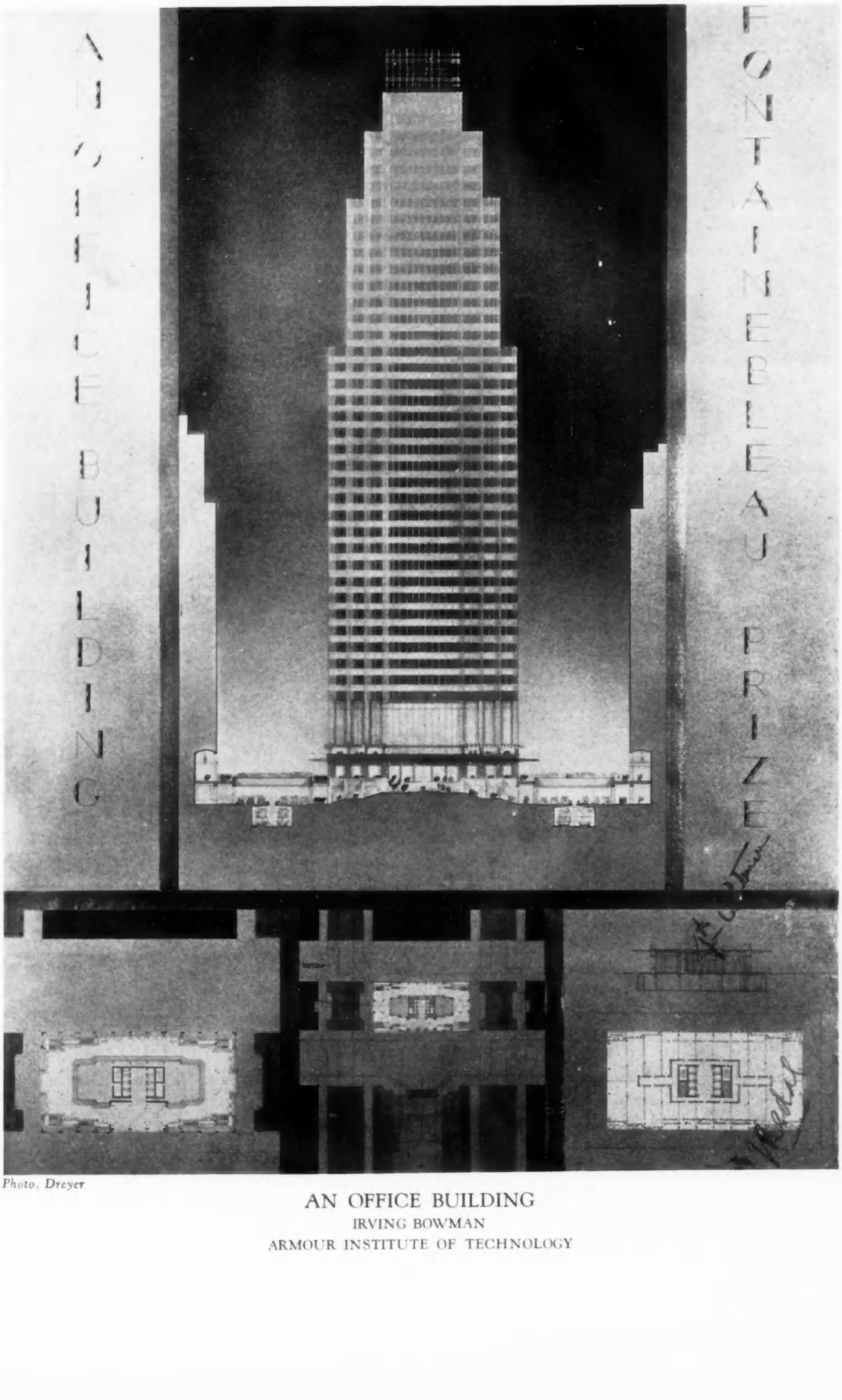
"The architectural schools of the universities," as J. Monroe Hewlett has said, "must become real schools of design, their curricula must be broadened to include education in those arts directly contributory and essential to architecture, and a way must be found for the student of design to select his special field as architect, painter, sculptor, landscape architect or designer in some other medium after such a preliminary course in the fundamentals of design as shall enable his special aptitudes to reveal themselves, and subsequently to maintain collaborative relations with his fellow students who have chosen other fields."

This suggestion comes with good grace from the collegiate schools of architecture, since the very fact that they are parts of colleges and universities implies a recognition of the unity of knowledge. The school of design which will not only draw together and harmonize all the arts of design but will also fit them into the general cultural scheme must be looked for first on the college campus. We may find it in the union of an existing school of design with an institution of higher learning.

There is every reason to believe, certainly, that both the Chicago Art Institute and the University of Chicago would profit enormously if they could join forces. If some prejudices had to be discarded on both sides and some deeply rooted habits given up so much the better. It is always a wholesome thing for educators, in the arts or in any other field, to jettison habits and prejudices. But this is not a reform that will be brought about in a day. So much of the teaching in the arts has been inspirational, not to say chaotic or even irrational, that any effort to systematize it will meet with strong opposition.

The chief indictment against the poor and narrow school of architecture is that it teaches too drily and rigidly. Architecture needs the other arts as badly as they need architecture. It needs their lightness and imaginativeness to give life to its own cement and steel. Consequently the condition of general education in the arts is important to the teacher of architecture.

The dangers in the present scheme of architectural education are precisely the opposite of those we find in the usual schools of fine art. Instead of not being disciplined at all the student runs the risk of being regimented out of all originality. Where a conscientious effort is being made to graduate him in four years—and this still happens—he has almost no choice of studies. The lengthening of the course and the admission of general studies helps break down this rigidity. Yet a student of architecture is formed, professionally at least, by his own subject. There is a considerable variety of opinion among instructors as to the proportions in which the elements of design, construction and theory should be blended. But on the whole the American student in architecture is confronted with a standardized plan of study. This has its



Photo, Dreyer

AN OFFICE BUILDING
IRVING BOWMAN
ARMOUR INSTITUTE OF TECHNOLOGY

obvious advantages. It reduces the amount of inept and aimless teaching. It gives meaning to an architectural degree.

But even in the proceedings of the Association of Collegiate Schools of Architecture one finds signs of doubt as to just how far standardization ought to go. For instance, how fundamental should be the difference between the training of the architect and that of the "architectural engineer," between the man who gives a building grace and the man who sees to it that it is an efficient machine? Should there be a separate educational hopper for each? Does the age of specialization forbid that one man should envisage the whole scheme of a structure, so that beauty may arise out of use and use out of beauty? Again, to what extent is it possible to allow regional influences to affect architectural education? Shall every budding architect be so trained that he can instantly and without adjustment begin following his profession in New York City, San Francisco or New Orleans? Or should the student at Tulane let himself be stamped forever with the idiom of the Vieux Carré, the student at Harvard with the measured dignity of old New England houses and churches? The drift is perhaps in the other direction. Having escaped anarchy we are perhaps tempted to let ourselves be led into over-centralization.

When a layman touches the delicate subject of competitions he may be rushing in where only angels—with architectural degrees—ought to tread. But a layman cannot avoid having doubts. On the one hand there are evidences of fine fervor when the Beaux-Arts contests are under way. On the other hand it is by no means certain that the creative impulse and the desire to win a prize are one and the same thing or that they are always compatible. "No school," says a bulletin of the Massachusetts Institute of Technology, "can safely gauge the quality of its performance without constant comparison with the work produced in other schools." But no juries, not even those of the Beaux-Arts Institute of Design, are infallible. Too great a deference to the tastes and mental habits of a particular variety of jury will certainly kill originality. We observe the University of Oregon rejecting the prize system as harmful. "Believing that highly competitive methods are apt to stress a false objective and prevent the maximum development of character and individuality," so runs its announcement, "the school abandoned several years ago all competitive features consistent with the general University policy." This vigorous gesture of a small and remote institution is refreshing.

It is quality of originality which one continually seeks in visiting schools of the fine arts. Architectural schools particularly need this virtue, since the methods of engineering and of commerce are continually tending to pull them into line and make them safe and commonplace. The layman may underrate technique, simply because he is not acquainted with it. Yet it seems reasonable to leave the more severely technical aspects of architectural education to the forces now influencing them.

Our buildings will stand up. But how are we to be sure that they ought to stand up? For the answer to that question we must turn to architecture, not as engineering but as art, not as one art but as the union of the arts, and not as a discipline but as a free flowering of the creative imagination.

This is what the schools must give us. It is what a few of the leading schools—I hope no one will quarrel with me if I mention the school at Yale as one of half a dozen possible illustrations—are already giving us. The others must follow if architecture is to play the dominant part possible in an "American Renaissance."

SMALL SHOPS

J. R. DAVIDSON, DESIGNER

Photo. Morgan

RECEPTION ROOM
C. R. HITE COMPANY, LOS ANGELES, CALIF.
J. R. DAVIDSON, DESIGNER

Wall panels of Philippine mahogany, slightly stained.

Aluminum moldings between horizontal mahogany panels, carried around room through sash, radiator, doors and shelves, to give unity of effect.

Linotile floor in four colors: dark brown, light brown, dark blue, gray blue. Linotile base 3 inches high. Radiator of black Belgian marble with aluminum strips.

Ceiling of plaster tinted a pale blue.

Center ceiling light fixture with aluminum brackets with two decks of sand-blasted glass.

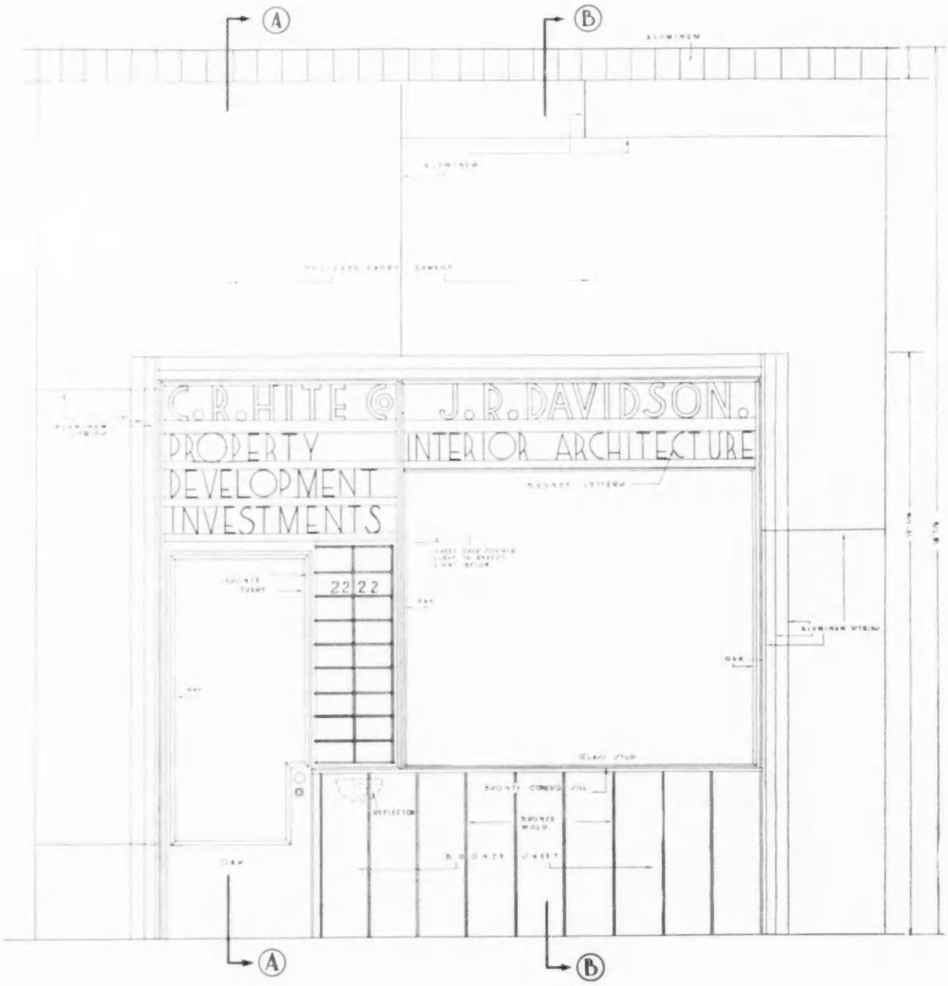
Seat in reception room of dark blue leather.

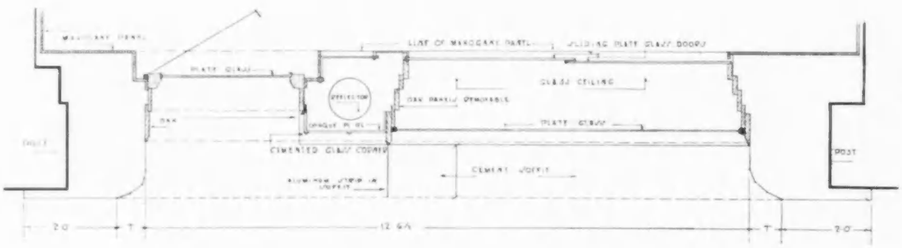
Photo. Morgan

SHOP FRONT

C. R. HITE COMPANY, LOS ANGELES, CALIF.

J. R. DAVIDSON, DESIGNER



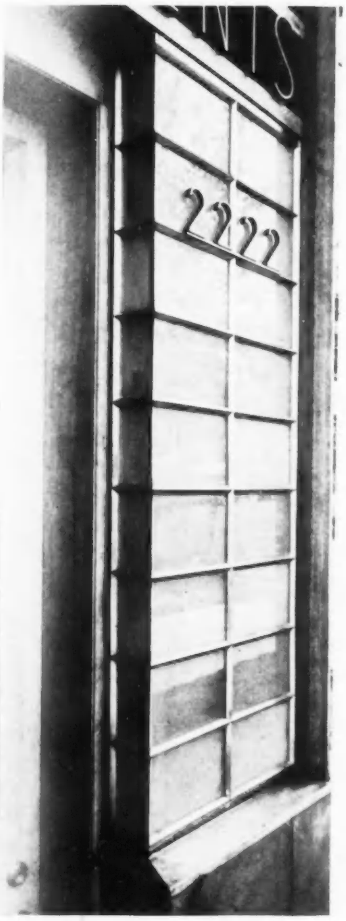


Surrounding surface of chemically stained (light green) polished cement.

Aluminum strips to prevent cracks (by allowing for expansion changes in concrete surface).

Natural solid oak (varnished) for frames of show window and doors.

Natural colored bronze, sand finished and lacquered beneath show window for framework.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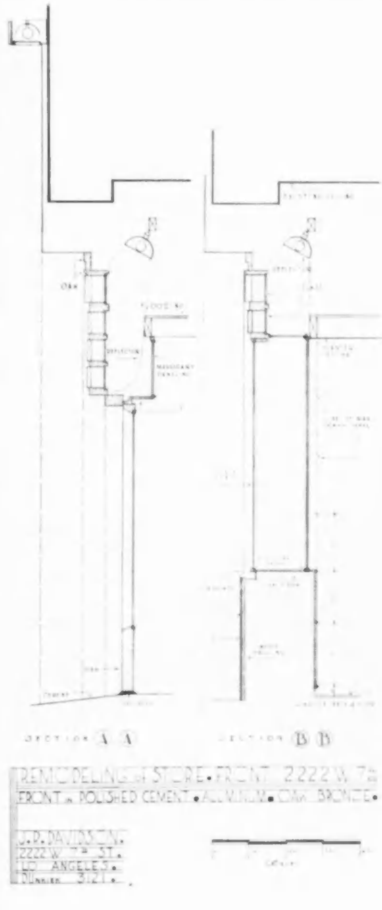

SECTION A A
SECTION B B
REMODELING of STORE • FRONT 2222 W 7th
FRONT = POLISHED CEMENT • ALUMINUM • OAK BRONZE •
J.R. DAVIDSON.
2222 W 7th ST.
LOS ANGELES.


FLOWERS
DESIGN of
STORE • FRONT • Nº 2214 to 2226 W 7th
in PARK • SQUARE
J. R. DAVIDSON.
2222 W 7th

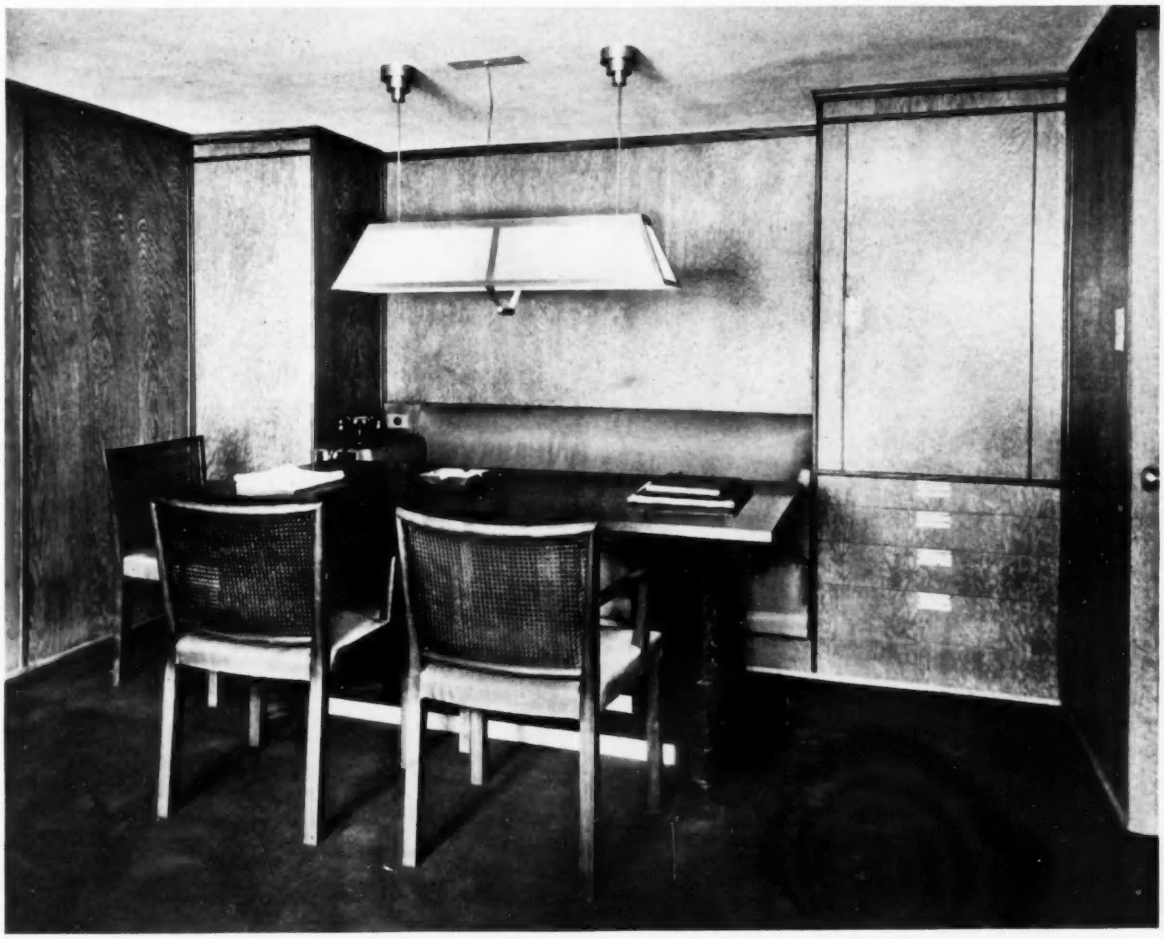
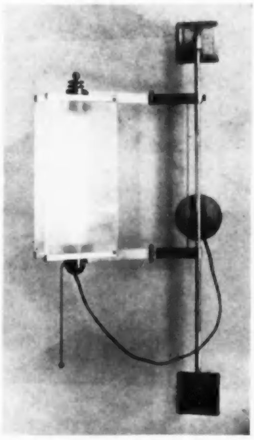


Photo. Morgan

CONFERENCE ROOM
HITE AND BILICKE, LTD., LOS ANGELES, CALIF.
J. R. DAVIDSON, DESIGNER

Paneling of 5-ply oak veneering, stained slightly in a warm gray.
Walnut moldings covering seams of oak panels. Chairs and table in walnut. Chairs and settee upholstered with copper-colored horsehair cloth.



LIGHT OVER DESK

Table top in *Formica* (a *bakelite* product).
Table stretcher in natural brass.
Light fixtures in natural brass and translucent glass.
Height of fixtures adjustable by means of counterbalance in wall or ceiling.

Photo. Morgan

OFFICE FRONT
PREISSMAN AND COMPANY, LOS ANGELES, CALIF.
J. R. DAVIDSON, DESIGNER

BAUHAUS,
DESSAU,
GERMANY

WALTER
GROPIUS,
ARCHITECT

Photo. Kilham, Jr.

TECHNICAL NEWS AND RESEARCH

CCTOBER · 1929

Featuring:

NEW CONSTRUCTION METHODS

Previous Studies: Swimming Pools, Storage Garages, Apartment Houses, The Small House, Airports, Store Buildings, Kitchen Planning, Sound Proofing the Hospital, Planning High School Buildings.
Future Studies: The Country House, Principles of Remodelling, The Motion Picture Theatre.

NEW CONSTRUCTION METHODS

ROBERT L. DAVISON*

THE PROBLEM. It is now financially impossible for the average man to buy, build or rent a new four-room apartment or home.†

*THE SOLUTION. "The real solution probably lies in some radical departure in house construction and economics, as it does not appear to us that we are likely to have such relative readjustments as will correct this situation." Herbert Hoover.***

NEW CONSTRUCTION METHODS

A 12% decrease in the total volume of construction for the first six months of 1929 from the corresponding period of 1928 is largely due to a decided reduction in residential work. Commercial buildings show a 5% increase, industrial buildings a 28% increase, while residential work shows a decrease of 28%. This startling decline is not due to a lessened demand for dwellings but to the inability of the building industry to produce dwellings at a price within reach of the average man.‡ The great percentage of construction work has been for clients with high incomes. (See opposite page.)

High costs restrict the market for residential work but have slight effect on industrial, commercial or public buildings because the sale or rental value of non-residential buildings is primarily limited by their relation to other buildings of a similar character whereas the sale or rental value of residential buildings is *very definitely limited* by the income of the prospective tenant.

CHEAPER DWELLINGS MUST BE BUILT

WILL THE ARCHITECT OR THE SPECULATIVE BUILDER SOLVE THIS PROBLEM?

(a) The building contractor has built more cheaply but not better than the architect.

(b) The architect has designed good but not economical buildings.

(c) Business in the future will go to the man who can build not only well but economically.

CAN THE ARCHITECT DESIGN BETTER AND MORE ECONOMICAL BUILDINGS UTILIZING PRESENT MATERIALS?

To a limited extent he can economize through plan efficiency and conservation of materials.

This economy is achieved through elimination. The results to be accomplished in this field are necessarily somewhat limited, and not sufficient to reach the new market.

If house construction costs could be reduced at the same rate that automobile costs have been reduced, *it is probable that the total yearly construction of dwellings would be increased very greatly*. Table on page 385 shows the money value of the potential market for low cost dwellings. As a matter of "good business," the basic economic factors are worthy of study by all in the construction industry.

I. BASIC PRINCIPLES GOVERNING IMPROVEMENT OF CONSTRUCTION METHODS

Before considering some of the more promising new methods of construction which are being worked out here and in Europe, a brief summary will be given of *some of the basic principles* which should underlie any attempt to improve building methods and lessen the costs of construction.

A. LACK OF PROGRESS DUE TO UNSCIENTIFIC APPROACH

Failure to put construction on an efficient basis has been largely due to an experimental or inventive approach in place of scientific research as in other industries. Builders and designers have had an idea that a certain material or method would be the solution and have then attempted to prove they were right rather than to study the problem with an open mind and to try to find a solution. That the *method of approach* is vital is indicated in the following analysis.

B. WHAT IS AN IDEAL BUILDING?

This seems a simple question. One might say that a building should be beautiful, fireproof, weatherproof, well insulated, efficient with low maintenance cost and as inexpensive as compatible with these factors. These qualifications seem self-evident and one might assume that no research is needed to determine

*This research in new construction methods was undertaken at the suggestion and in coöperation with the Research Institute for Economic Housing. One of the editors of The Architectural Record was sent to Europe to study what had been accomplished abroad. The results of this study have been checked and approved by the technical members of the advisory council of the Institute and various architects, engineers and specialists.

†See Addenda, page 385.

‡See Addenda, page 385.

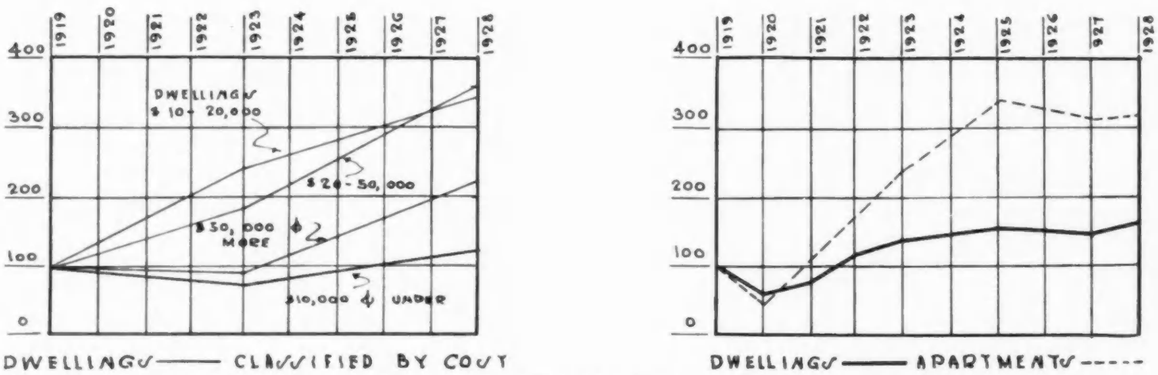
**Comment on proposed housing research by President Hoover when Secretary of the Department of Commerce.

desirable factors. Quite a different attitude, however, is imperative.

C. NEED OF RESEARCH TO DETERMINE QUALITIES DESIRED

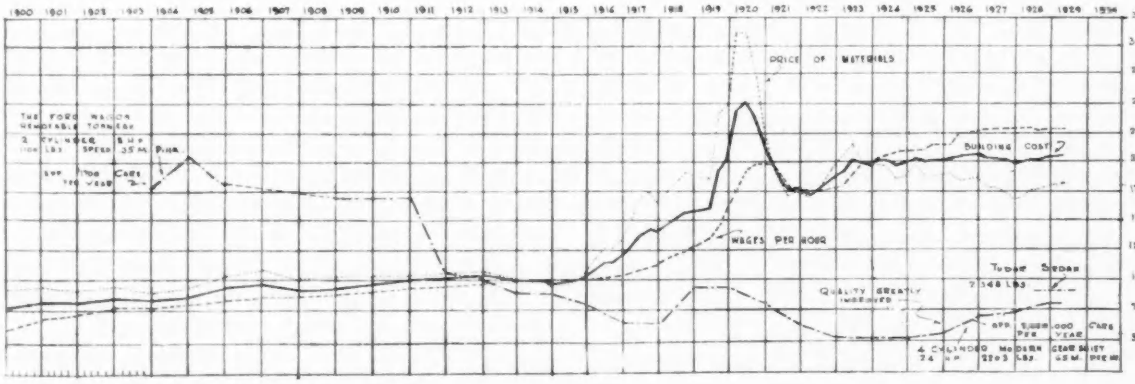
Let us analyze the factor of heat insulation, about which there is considerable definite information, as an illustration of how little is really known concerning the desirable qualities of a building. A person trying to improve present construction materials or methods in selecting a wall material would consider its value as a heat insulator, but no attention would be paid to the specific heat of a wall material and its effect on comfort and the heating cost of buildings.

It is not generally known that of two walls having exactly the same heat loss, once equilibrium has been reached, one wall may absorb as much as 36 times as much heat as the other to bring its surface to room temperature. The length of time required to bring a particular wall to room temperature may vary from ten minutes to six hours depending on whether the insulation is on the inside or outside of the building, the heat loss *through* the wall being practically



INCREASE IN TOTAL VOLUME IN VARIOUS CLASSES OF RESIDENTIAL WORK

The scales indicate percentages of the 1919 total floor area in square feet, as recorded for 27 Northeastern States by F. W. Dodge Corporation.



The Conference Board Bulletin and the National Automobile Chamber of Commerce

BUILDING COST COMPARED WITH FORD AUTOMOBILE COST

The vertical scale indicates cost index numbers based on the year 1913 as 100. From 1904 to 1929 the building cost index number increased from 82 to 205; the same 25-year period the Ford cost index dropped from 178 to 78.

This difference in cost is partly explained by a comparison of wages, production and labor costs of 1916 and 1920 in the building field and in the automobile industry.[1]

Employees	*Wages Increased*	*Production per Man*	*Unit Increase in Labor Cost*
Bricklayers	92%	Decreased 40%	220%
Factory employees	118%	Increased 49%	50%

This difference is largely due to increased machine work in factories. The above comparison should not be construed as implying that labor costs are the only factor keeping up building costs. Labor accounts for only 41.8% of cost of erecting a building while material is 58.1%[2], but overhead superintendence, profit per cent may be less on a quantity produced article.

[1] Wealth and Income of the American People. Ingalls, G. H. Merlin Co., P. 21.
[2] Monthly Labor Review, U. S. Department of Labor. Jan., 1929. P. 8.

identical in either case. From the standpoint of comfort and heating cost, the quickly heated building is probably preferable.

If there are unconsidered facts about heat insulation it may be assumed that problems such as sound insulation, sound absorption and resilience of floors may require even greater study before we know what it is that we should strive for.

II. QUALITIES DESIRED IN A BUILDING

Tables should be set up giving the material and rating of present methods and the desirable rating of materials in a new method.

The tables given are only *illustrative of the principles involved*. A thorough research may reveal that some values are too high and others too low or that some are relatively unimportant while others are of first importance, or some factors have been omitted. The essential point is to proceed in a logical manner.

Since the following tables were prepared the author's attention has been called to desirable factors which were not included, such as proper placing of windows for sunlight, planning the house with special reference to the raising and education of children. Doubtless there are other factors which have been overlooked but should be included.

A. METHOD FOR STUDY OF FACTORS INFLUENCING COMFORT (DWELLINGS)

FACTORS Influencing Comfort	PRESENT METHOD		NEW METHOD	
	Material	Rating	Material	Desirable Rating
	Representative Example			
Waterproofing (Wall)	Brick 9" Plaster ¾"	Variable but inefficient	?	100%
Heat loss (Ceiling and roof)	Wood lath and plaster ½" Wood shingles on strips	.224 B.t.u.[1]	?	.10 B.t.u.
Heat loss (Wall)	Brick 9" Plaster ¾"	.332 B.t.u.[2]	?	.10 B.t.u
Air leakage (Window)	Double hung 30"x42" 50 mile wind	8364 B.t.u.[3]	?	100 B.t.u.
Time to heat (Wall) See page 000	Brick 9" Plaster ¾"	6 hours[4]	?	10 min.[4]
Sound resistance	Wood joists Double flooring Plaster ceiling	35 S.U.[5]	?	80 S.U.[5]
Sound resistance (Partitions)	Wood stud Plaster	40 S.U.[5]	?	80 S.U.[5]
Sound absorption (Wall)	Plaster	3 4/10%[6]	?	80%[6]
Sound filter (Window or ventilator)	....	....	?	60 S.U.[7]
Resiliency (Floors)	Oak	50 points[8]	?	100points[8]

B. METHOD FOR STUDY OF FACTORS INFLUENCING CONSTRUCTION (DWELLINGS)

FACTORS Influencing Construction	PRESENT METHOD		NEW METHOD	
	Material	Rating	Material	Desirable Rating
Live load (Floor)	Residential Construction	30 lb.	?	20 lb.
Live load (Roof)	Residential Construction	25 lb.	?	25 lb.
Wind pressure (Exterior wall)	Residential Construction	50 lb.	?	50 lb.
Fire test (Floor, private residences 4 stories or less, or apartments over 2 stories and under 5 stories)	Wood lath and plaster	½ hr.	?	1 hr.
Fire test (Partitions, residences under 5 stories)	Wood lath lime plaster	20 min.	?	1 hr.
Fire test (Partition, elevator shaft, apartment for 3 or more families)	3" Gypsum	2 hr.	?	2 hr.
Fire test (Floor, buildings over 4 stories and under 75 ft. high)	Bar joist with inch of cement on top and metal lath and plaster on under side and other	2 hr.	?	2 hr.
Fire test (Floor, buildings over 75 ft. high)	Concrete or equal	3 hr.	?	3 hr.
Fire test (Wall or Columns bearing buildings over 4 stories)	Brick 9"	4 hr.	?	4 hr.
Fire test (Non-bearing walls, and bearing under 5 stories)	Steel stud, metal lath stucco and cement plaster	2 hr.	?	2 hr.

[1]American Society of Heating and Ventilating Engineer Guide, 1929, page 45.

[2]A. S. H. V. E. Guide, page 22.

[3]A. S. H. V. E. Guide, page 15.

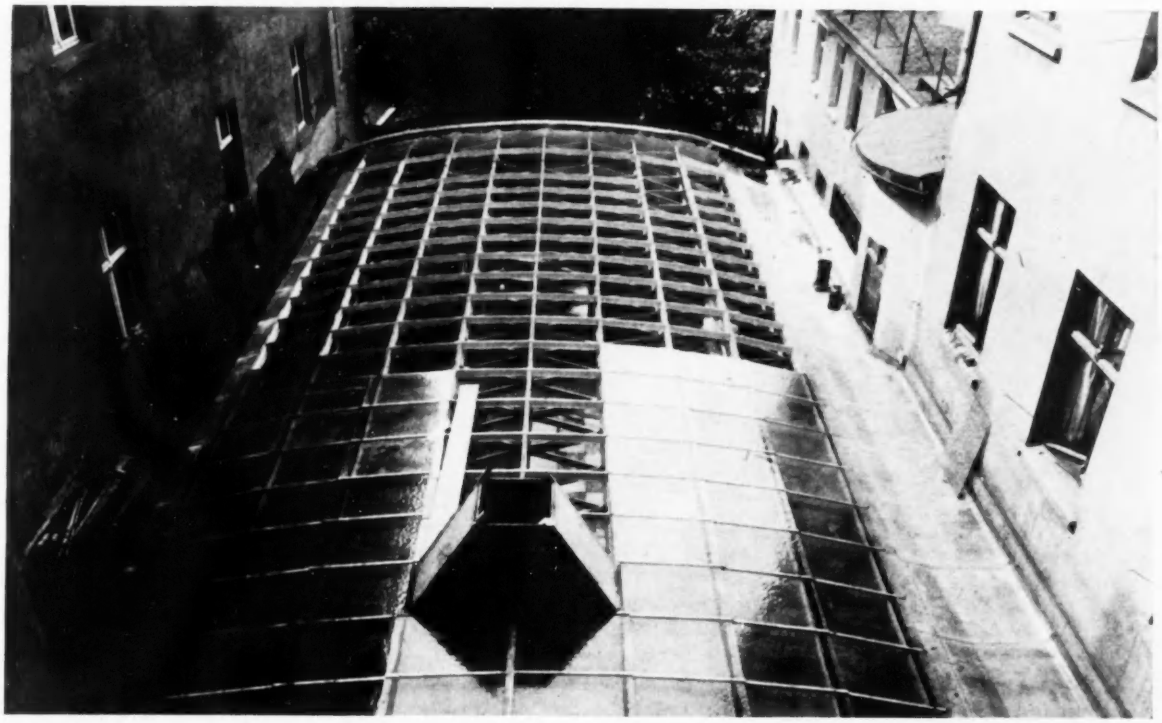
[4]Report of the Building Research Board for the year 1927 Department of Scientific and Industrial Research, London. Published under the authority of his Majesty's Stationery Office, 1927, page 101. See also page 363 of this article.

[5]S. U. or Sensation Unit is approximately the smallest change in loudness level of sound possible for the ear to detect. There are about 135 sensation units between the 'threshold of hearing and the threshold of feeling' the maximum sensation of loudness which the ear can register." Architectural Record, March, 1929, page 292. See this article for further discussion of sound insulation.

[6]Architectural Record, March, 1929, page 290.

[7]Some experimental work has been done with sound filters. See Thatchboard, Published by Heat & Sound Insulation, Ltd., London, page 21.

[8]A method of rating floors in which cork flooring is given 100 points in the scale of rating and oak is given 50 points. L. L. Phillips, Properties of Flooring Materials. Lefax, Phila., 1927.



GLASS ROOF TREATMENT

INTERIOR SHOWING STEEL VAULT CONSTRUCTION
RESTAURANT, DESSAU, GERMANY
PAULSSEN, ARCHITECT

C. METHOD FOR STUDY OF FACTORS INFLUENCING ECONOMICS (DWELLINGS)

Economic Factors Involved in Construction	Present Method	New Method
Construction Processes		
Machine work	Minimum	Maximum
Field work in proportion to factory work	Large percentage	Small percentage
Processes between raw and finished product	Many	Few
Organization from start to finish	Non centralized	Centralized
Standardized production	Little	Much
Transportation		
Weight	Heavy units	Light units
Handling	Easy	Easy
Damage in transit	Limited	Limited
Units as large as can be handled without derricks	Limited size	Increased size
Market Factors		
Cost	In excess of average income	Within average income
Quality	Generally poor	Excellent
Utility	Inefficient	Efficient
Sales resistance	Considerable	Minimum
Installment purchasing		
Down payment	High	Low
Monthly payments including upkeep	High	Low
Low money costs depending on		
Scale of financing	Small	Large
Depreciation	High	Low
Maintenance	Very high	Minimum
Obsolescence	Very high	Minimum
Overhead Costs of Builder and Real Estate Dealer		
Advertising	High	Low
Sales	High	Low
Financing	High	Low
Erection	High	Low
Servicing	High	Low
Resales	High	Low
Risks	High	Low

III. NEW MATERIALS AND CONSTRUCTION METHODS

New materials and construction methods may be classified under two general headings: those which evolve from present methods and those which are revolutionary in character.

A. EVOLUTIONARY

Illustrations of gradual evolution include various types of concrete blocks, hollow tile or other substitutes for brick; wall boards in place of plaster; and steel studs or concrete lumber in place of wood framing. The changes that result from their use are slight and as a general rule the savings are comparatively small. There is, however, an improvement in some cases in quality or comfort due to new methods.

1. Small Units.

A variety of units have been developed as substitutes for brick. The theory supporting these substitutes involves the use of a unit larger than brick size and one that may be more cheaply manufactured, handled and installed. In order to get the increased size without excessive weight, the unit is generally made hollow. Sometimes a lighter material is used.

(a) *Cement Blocks.*

The average cement block takes the place of sixteen bricks and shows some saving in cost, even after the addition of stucco which is generally considered necessary.

In England, Germany and Holland these cement units, including stucco, cost about the same as a brick wall. The main advantage of their use, according to statements by leading architects and engineers in these countries, is that an alternative method of construction is permitted in case of difficulty with material dealers or labor unions.

(b) *Light Weight Blocks.*

Demand for reduction of weight in building materials has resulted in the rapid development of various forms of aërated concrete and light weight aggregates for concrete construction. Outstanding progress has been made in the production of a light weight heat-treated clay aggregate called *Haydite* which is similar in its manufacture to puffed rice.*

Concrete using *Haydite* weighs 100 lb. per cubic foot as compared with 150 lb. per cubic foot, the weight of concrete made from standard aggregates. It has the strength of standard concrete and may be designed for any given strength by standard methods of water-cement control.

Used in concrete masonry, an 8″ by 8″ by 16″ unit meeting standard specifications weighs 26 lb. as compared with 47 lb., the weight of a standard concrete unit of the same size. These blocks have the added advantage of nailability, increased sound and heat insulation and extremely low capillary absorption. (See also *Haydite* Roof Slabs, page 370.)

2. Stud and Roof Units.

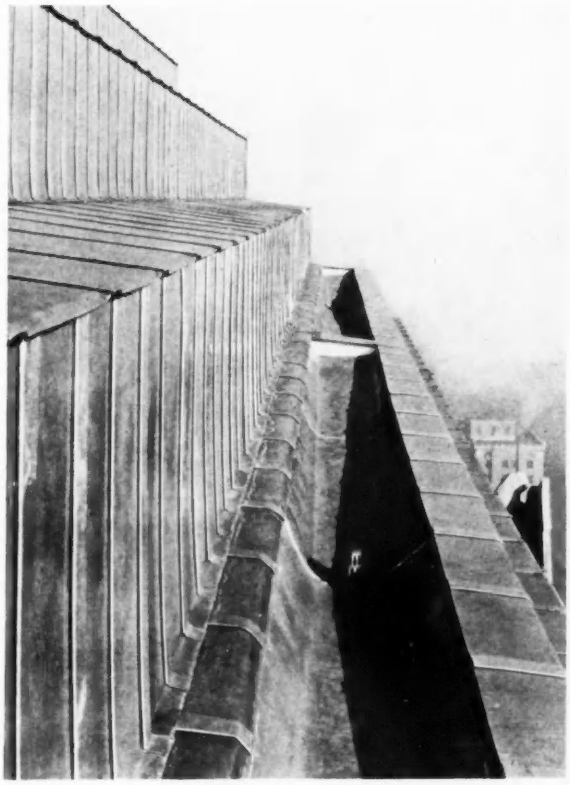
(a) *Wood Arch Vault Units.* The *Lamella* trussless roof, a construction method imported from Germany, utilizes the principle of interlocking timber

*Description of manufacture of *Haydite* aggregate: "As the lumps of shale or clay roll down the kiln they are preheated at a temperature of approximately 800° F., which vitrifies a thin layer of the outside of each particle thus confining the combustion gases resulting from subsequent burning of the inner portion of the raw material. When the preheated particles reach the burning zone they are subjected to intense heat from the impinging flame of the second fire nozzle, which brings them to incipient fusion, approximately 2000° F. At this point the vitrified outer layer is softened and the sudden rise in temperature causes the confined gases to expand, puffing out the lumps to 2½ times their original size, and the expanded material partially fuses forming porous clinkers composed of minute cells each surrounded by a wall of vitrified clay. The clinker is then dropped from the kiln and allowed to cool."—Portland Cement Association. Technical Data Sheet No. 45.

units to form a vault. This construction is economical for large spans and its appearance is much better than the ordinary truss. To date some 4½ million feet have been erected in the United States, some of the latest examples being the Casino in Central Park, Joseph Urban, architect*; Westchester County Community Center, 127′ span, Walker and Gillett, Architects; and the Highlands Arena, 165′ span, in St. Louis, G. R. Kiewitt and H. M. Sohrmann, architects.

(b) *Steel Vault Units*. The *Lamella* units are also manufactured in Germany from steel and are now manufactured in this country by the American Car and Foundry Company. In the restaurant illustrated (page 365) the steel is left exposed on the under side and covered with glass on the outside.

(c) *Steel Frame Construction*, used with curtain walls of stucco or brick. Several types of steel stud construction have been developed for houses and other buildings of limited height. Although these are an improvement over wood studs they generally cost more and as yet do not sufficiently simplify the construction processes to warrant their use as a means of economy in erection costs.



SHEET ALUMINUM WALL
CIVIL COURT HOUSE, ST. LOUIS, MO.
PLAZA COMMISSION, INC., ARCHITECTS

3. Medium-sized Sections. (Handled by two to four men without derrick.)

Most construction methods utilizing medium-sized sections are evolutionary in character. In many cases they supplant two or three materials and processes and reduce the amount of labor required in erection but the finished wall is practically the same as in old construction methods, the principal difference being that some of the work is done at a factory before sending the unit to the job.

There are various forms of concrete lumber, two of which are shown in the accompanying sketches. After these sections are erected, it is necessary to apply metal lath or wall board and plaster on the inside, unless a double wall is used, and to stucco the outside. From the standpoint of cost it then becomes a question of comparing the cost of (1) poured or cement-gun stud, metal lath and a base coat of stucco as applied in the field with (2) the cost of manufacturing the unit in a plant plus various overhead items. A complete analysis will generally show that after handling, transportation, factory overhead, advertising, sales costs and profits are taken into consideration, the difference in cost due to factory production may be "in the red."

(a) *Armoboard Concrete Lumber*.

This is representative of a class of concrete wall units used for garages and one story houses and industrial buildings.

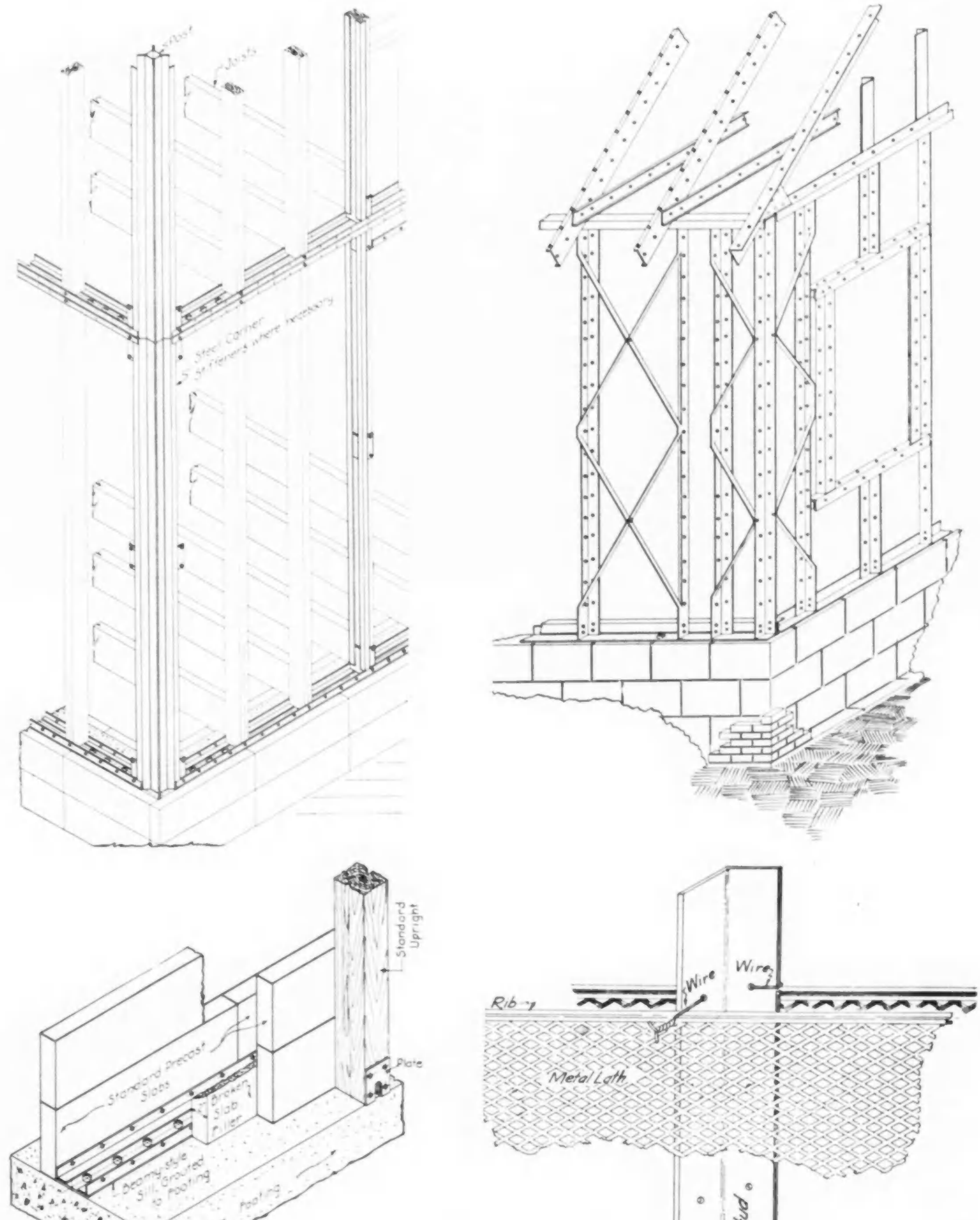
Armoboard sectional wall panels (3′ by 7′ to 12′ high) are set up on the job and bolted together. For garage construction stucco need not be added, but in most cases one or two coats are applied. If used in a dwelling, inside lath and plaster or wall board are required.

(b) *Tee Stone*.

This is a precast, reinforced structural concrete unit and covers a wide variety of construction applications. Up to the present time the manufacture of this product has required pouring concrete into forms on the building site for use as foundation, floor, side walls or roof. The product is now manufactured at plants and is available for general distribution in the New York district. Economy of materials and convenience of handling are the two outstanding qualities claimed for this material.

Tee Stone units are manufactured in standard lengths of 8 to 16 feet, with a normal flange width of 16 inches and a stem depth of eight inches. The thickness throughout is one inch, with heavy reinforcement steel wire and rods included. This product weighs less than 16 pounds a square foot, has a compression value of 90,000 pounds per story height and

*Illustrated in Architectural Record, August, 1929.



BEAMY-STYLE FRAME HOUSING CO. WALTER BATES STEEL CORP.

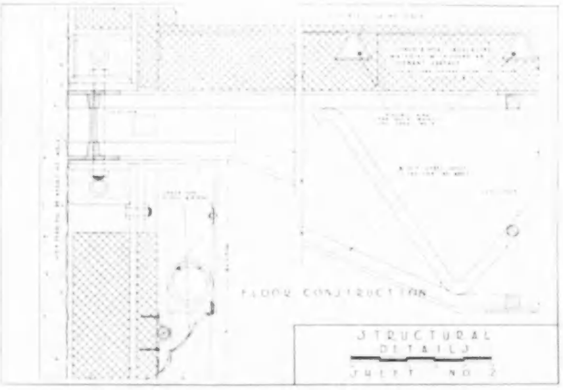
TYPICAL STEEL FRAME HOUSE CONSTRUCTION

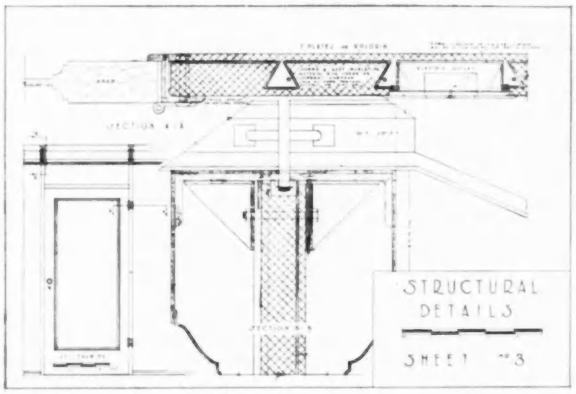
American Institute of Steel Construction

"BATTLE DECK" FLOOR CONSISTING OF 3/16" WELDED STEEL PLATES (WITHOUT MASONRY CONSTRUCTION)

HARTY AND BROWN, ENGINEERS, BOSTON

The total cost of a floor constructed of 3" I-beams, 3/16" plates, covered on the top with cork tile and fireproofed on the under side with metal lath and plaster, will be about $1 a square foot. This type of floor construction will weigh from 20 to 60 pounds less than any of the types now in use. In a 75-story building the saving in dead load on the foundation for each column will be nearly two million pounds.





STUDY INDICATING USE OF STEEL ROOF DECK FOR FLOOR AND WALLS

"Roof decks built of steel rolled into a combination of flat plates with ribs at intervals give a light weight fire-resisting construction which may well be developed into use as floor, wall and partition units, susceptible to quantity production in factories, light in weight for shipment, adaptable for combination with insulating materials and possibly made rustless by alloy or coating so as to save the cost of plaster and painting."

Charles W. Killam,
Professor of Architecture, Harvard University.

can be designed to carry live loads in excess of 250 pounds a square foot of flange area with a high factor of safety, the manufacturers state.

The material can be turned stem to stem where a double wall with adequate air space between is desired. For walls, floors, beams and roofs, these units are bonded together.

This system has greater strength than *Armoboard* and is more suitable for use in larger dwellings, warehouses, factories and commercial buildings. It is also used to some extent for retaining walls and bulkheads in engineering work. Special units are provided for jams and lintels.

A very economical fireproof floor construction is also provided. The flange, for small spans, may be laid downward and flooring applied to the nailing strip which is embodied in the unit when cast. For large spans the flange should be upwards and the flooring is applied to a nailing strip on the upper surface while lath and plaster are applied to the under surface of the stem.

(c) *Haydite Aggregate Concrete Slabs.*

Haydite is also used in precast roof slabs which have the advantage of lighter weight and better heat insulation than ordinary concrete.

Haydite concrete has been used structurally for erecting new buildings and for increasing the height of existing structures. For new buildings the purpose is to effect economies in design due to a reduction in dead load by use of light weight concrete in columns, floors and walls. Where buildings have been designed to carry additional stories of standard materials, the number of new stories may be increased by the use of light weight concrete in the addition.

(d) *Large Gypsum Units.*

One of the more promising developments in new construction methods is the large gypsum unit called *Rockwood* (see page 375). This has an advantage for wall construction over some forms of concrete lumber in that two surfaces are ready for plastering. Interior lath and base coat of plaster or plaster board are not required and the units are lighter in weight than concrete lumber.

Exterior and interior wall sections and floor sections are so manufactured that they act as the only needed molds for reinforced concrete. All wood forms are eliminated.

The wall sections are tongued and grooved, in 3″, 4″ and 6″ thicknesses, and are cut at the plant or on the job to any desired length, up to 20 feet. They are erected vertically from floor to ceiling without mortar or other binders and can be nailed or wedged in place at the top or bottom until the concrete reinforcement or plaster is in place.

Where *Rockwood* is used for non-bearing partitions, no concrete need be used, but where the partition bears part of the weight of the structure, reinforcing rods are placed vertically in the cored openings. These rods extend above the top of the casting and interlock with the horizontal floor section reinforcement. The cored sections, usually every third or fourth opening, are then filled with concrete at the same time that the floor section is poured, thus making a firm bond between the floor and wall section. The design of the reinforced concrete follows standard engineering practice.

The interior non-bearing partition section is made in 3″ thickness and 18″ wide, and can be erected in place at a labor cost of approximately 2 cents a square foot. The 4″ section material is made 4″ by 12″ and can be erected at 3 cents a square foot.

Bearing partition sections are also made 6″ by 6″ and 6″ by 12″ and can be erected at approximately 6 cents a foot.*

Where the partition tile is to be plastered, only one coat of plaster is necessary, owing to the evenness of the surface, and it can be much thinner than is ordinarily the case. This feature alone saves considerable weight, not to mention plastering costs.

Where the exterior lumber is to receive a coat of stucco, or brick veneer, it is the practice to cut horizontal dovetails in the face of the tile so as to insure a firm bond between the stucco or mortar and tile.

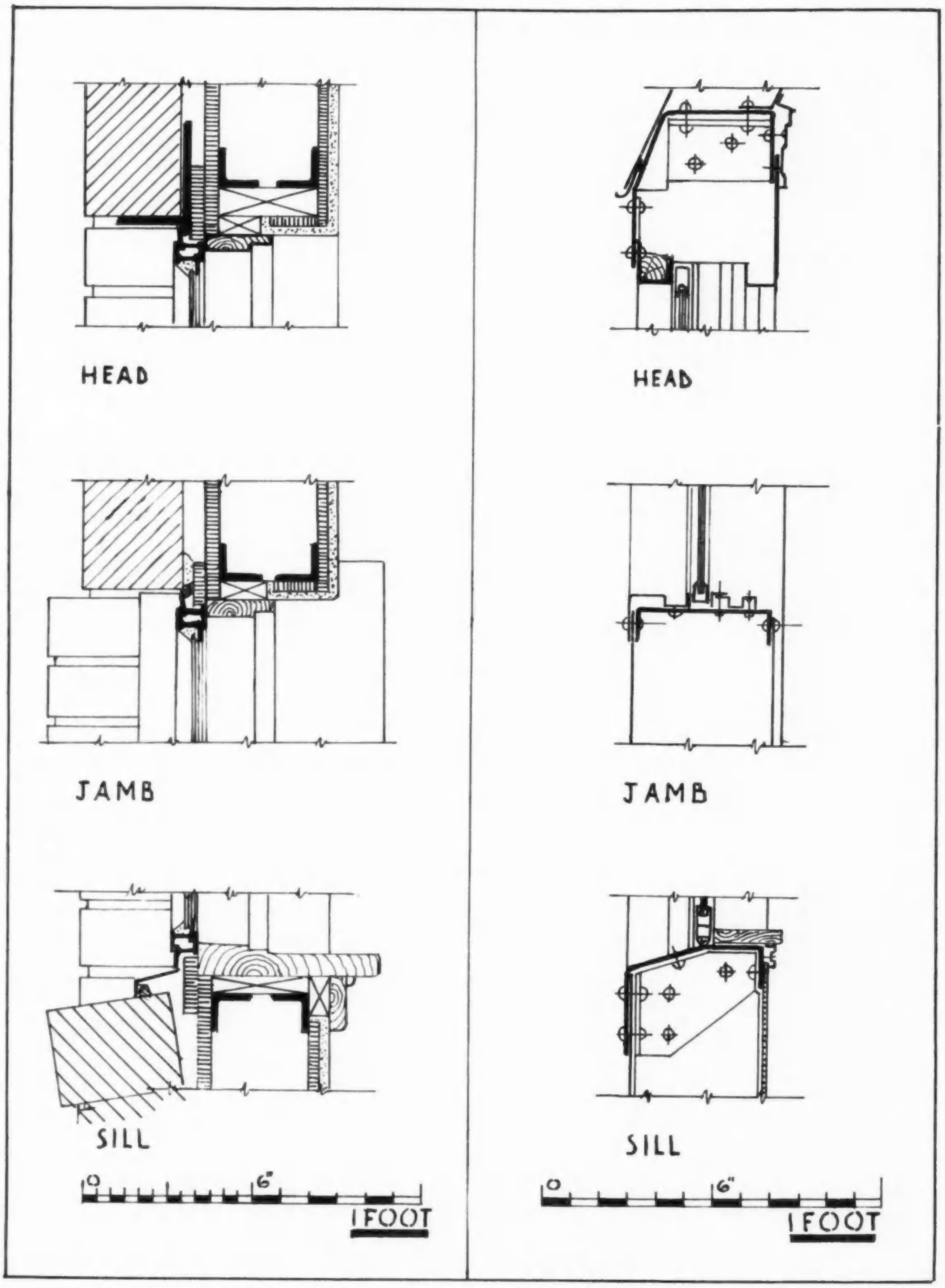
(e) *Solomit.*

This product is made by compressing straw, reeds, rushes, marsh litter, papyrus or similar vegetable fibres into panels at a pressure of 100 pounds a square inch, which renders it non-inflammable and fire resistant. These are tightly bound by parallel steel wires, running lengthwise on both faces of the panels transversely to the fibres, about six inches apart, and held together from one face to the other by steel hooks passed through the straw. The resulting panels are of uniform thickness, either one inch or two, and with a standard width of five feet. They can be secured in any length desired, up to about fourteen feet. There is nothing but straw (or other fibre) and wire in its composition. Superficially the material resembles a thick straw mat, but on handling it one notes the board-like hardness and an examination of a cross section at once suggests strength and durability.

Solomit by tests is found to be one of the best sound-absorbent and sound insulating structural materials yet put on the European market. It can be used in two ways to lessen noise, either by reducing reverberation and echoes within a room, or by preventing the penetration of sound from one room to another.

A very considerable saving in cost can be effected by the use of this material. In curtain walls or non-

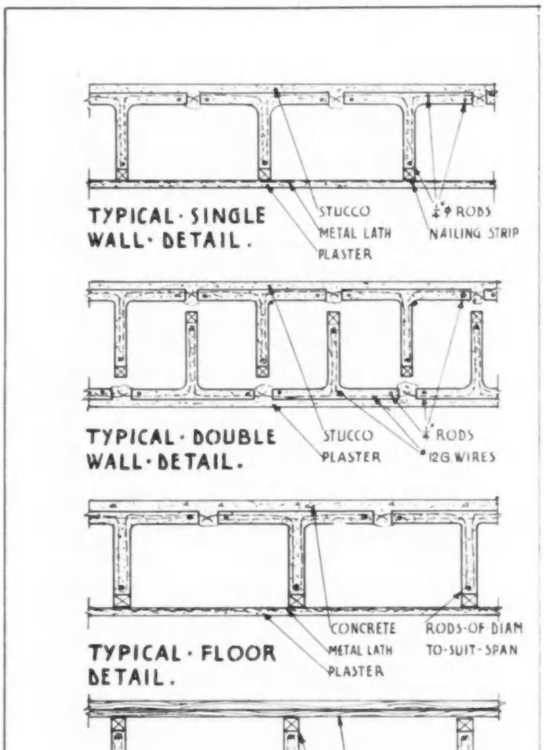
*The building trades department of the American Federation of Labor has decided that the erection of this material "comes within the jurisdiction of the carpenters."



STEEL FRAME HOUSE CO., PITTSBURGH
STEEL FRAME HOUSE WINDOW

NEW YORK RAPID TRANSIT CORP.
STEEL CAR WINDOW

COMPLEX WINDOW SECTION OF HOUSE CONTRASTED WITH SIMPLICITY OF STEEL CAR SECTION



TEE STONE CONCRETE LUMBER SHOWING VARIOUS METHODS OF CONSTRUCTION

bearing partitions no studs are required. Economies also result from a reduction in the weight of the whole structure and foundations, hence a saving in total costs.* Other advantages claimed for *Solomit* include: a reduction in the actual cost of walls and floors themselves; less transportation and handling at site; quicker erection and completion of buildings; the partial elimination of concrete forms for floor or ceiling work in all cases when this material, used with concrete, replaces one side of the form.

4. LARGE UNITS REQUIRING MECHANICAL HANDLING.

There has been some experimental work both here and in Europe with large size units requiring special derricks and other mechanical equipment for handling. In America the outstanding work has been that of Grosvenor Atterbury at Forest Hills, Long Island, and Simon Lake at Bridgeport, Connecticut. While the principle upon which these have been based is correct (that is, large units constructed at a factory) these units fail to comply with many of the requirements of an ideal building as enumerated on pages 364-6. They lack some comfort requirements and the saving due to factory production when compared with the present cost of accomplishing an identical result in the field appears too small to warrant the use of these methods. Large precast units have been used considerably in large housing developments in Europe. One of the outstanding examples is at Frankfort by Ernst May, architect, where a large plant is in operation at the present time. The slabs are made of pumice concrete which adds greatly to their insulating value and decreases weight to approximately a third of that of ordinary concrete. Although the work is done in very large quantities on standardized buildings with practically all the factors ideal for a system such as this, it has been found that at the present time construction with these large units costs more than if brick were used. This is in spite of the fact that amortization of the cost of plant is on the basis of twenty years, with low rate of interest and tax exemption. Although railway tracks have been built paralleling the rows of dwellings and railroad cranes are used for handling of these slabs, the contractors use brick foundations for these wall slabs since they find the brick cheaper.

The floor slabs in these buildings are concrete lumber with an "I" cross section but it has been found less costly to use wood ceiling joints and wood rafters. Apparently the only advantage of using precast sections is the speeding up of building. This may

*The weight of this material is three pounds a square foot or 18 pounds a cubic foot. A panel of *Solomit* 5 ft. by 12 ft. can be lifted by one man. In a new hotel at Biarritz, France, 130,000 square feet of this material have been used. Had this material consisted of 4½" brick the total load on the foundations would have been increased by more than 2,000 tons.

offset the additional cost of using this type of construction, but this advantage is probably in turn offset by the less desirable comfort factors. Although the insulating value of pumice concrete is high, it has a high specific heat and requires much time before the surface temperature of the walls is satisfactory from the standpoint of comfort.

5. Large Units not Requiring Mechanical Handling.

(a) *Portable and sectional wood buildings.*

In spite of all the advertising by companies selling factory built and portable houses, in most cases the carpenter-contractor can duplicate a factory built building at a lower cost to the owner. This is due to several factors. In the first place, although the cost in construction labor of a factory-built wall section may be one-quarter to one-tenth the labor cost of the same unit in the field, the handling, transportation and erection costs, together with factory overhead, sales and profit, more than offset the saving. In theory the house is factory built, but in practice the greater part of the work is still done on the site. This includes excavation, foundations, floors, roofs, application of plaster board, trim, painting, papering, wiring and plumbing. Most of this field work will be done in the factory or eliminated with some future construction method.

(b) *Light brick wall panels.*

One of the interesting experiments now being conducted in Germany which seems to offer great possibilities in the way of better and cheaper construction is a burned clay wall panel with a specific gravity of .5 (one-half the weight of water). This is made by aërating clay which is then fired. Due to the method of manufacture it is more impervious to moisture than ordinary brick and because of the cellular structure it has a very high insulating value.

Of considerable importance is the probability that the brick can be manufactured in units two or more yards square, and machined after firing so that it will have straight edges, which will permit its use in a steel frame as a curtain wall or veneer. This experiment is considered by leading German architects and engineers as one of the most promising now being conducted in Germany. It is generally conceded by European architects who have made a study of the housing problem and methods of reducing construction costs that a wall material must be found which is more efficient than our present form of brick wall. Whether this wall panel of the future will be a new type of brick or of metal may depend to a considerable extent on the forethought and experimentation of manufacturers.

B. REVOLUTIONARY DEVELOPMENTS

The three outstanding developments in the building industry which can be classed as revolutionary in character, are (1) the development of *reinforced concrete* construction; (2) the use of a *steel frame* which permitted the development of the modern skyscraper and (3) the use of various forms of *sheet metal walls*. To date, sheet metal, generally corrugated iron, has been used in factories, warehouses, farm buildings, garages and various types of temporary buildings, but sheet metal is coming into quite general use in office buildings for partitions and there is an increasing tendency to use it for exterior work.

A design for an all-metal building has been worked out by Frank Lloyd Wright, one of the first designers to consider the problem. His scheme was published in the October, 1928, issue of The Architectural Record.

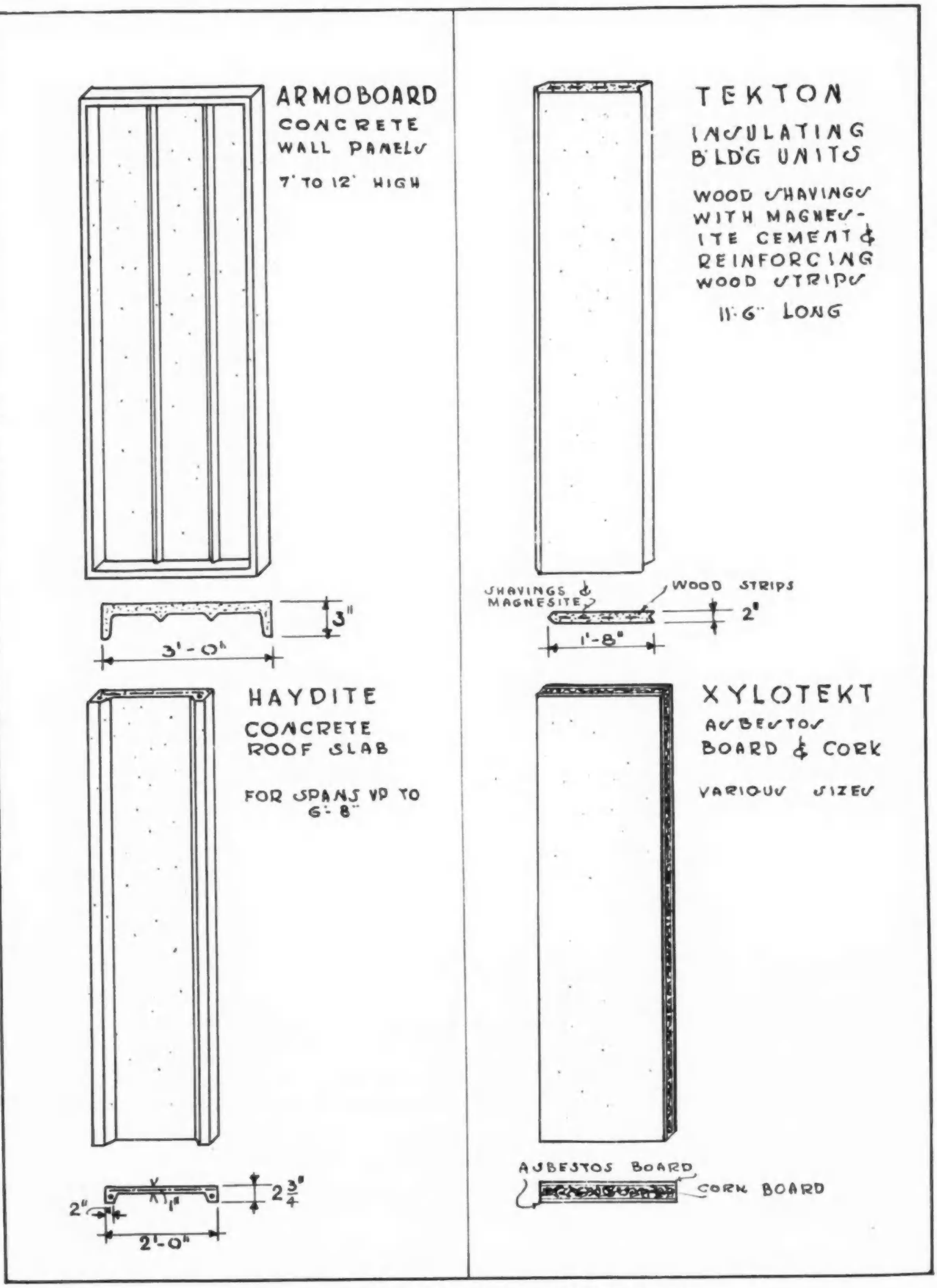
1. STANDARDIZED STEEL BUILDINGS WITH METAL WALLS

Although a local carpenter-contractor in most cases can duplicate a portable wood building for less money, portable steel buildings can generally be bought for less than steel buildings of similar character erected by the local contractor. Standardized steel buildings are produced for industrial purposes and for small buildings such as private garages, but very little has been done in America in the field of either metal wall or all-metal buildings for office buildings or residences.

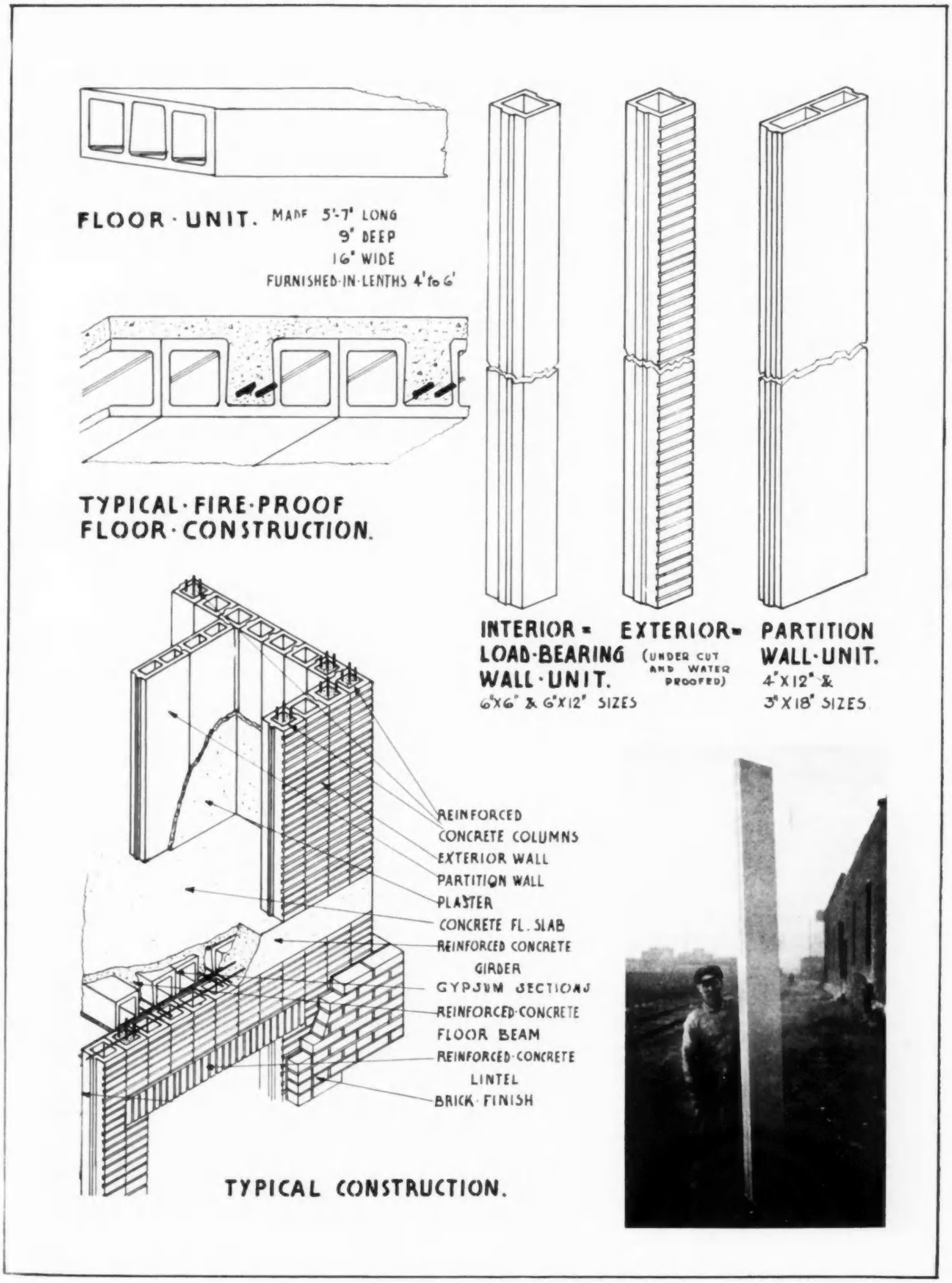
In England several types of metal buildings have been developed, but to date none of these has been satisfactory. In Germany the Junkers Company is experimenting with a metal building which is composed of units similar in principle to office partitions. They have erected two small buildings at their plant, one of masonry and the other, which is exactly similar in size, of metal. These two buildings have been equipped with thermocouples and various recording devices and all phases of the insulation problem are being analyzed with typical German efficiency. One of their experiments that has promise of giving satisfactory results is a wall section of two sheets of stainless and rustless steel where emissivity of heat is reduced by the polished interior surfaces of the double wall.

This company has also developed a very light door of pressed aluminum (approximately 26 gauge). This door can be manufactured economically and does not need to be painted. These doors have been used throughout the office building at the Junkers factory and have given satisfaction. They have a high sound insulation value considering their lightness of construction.

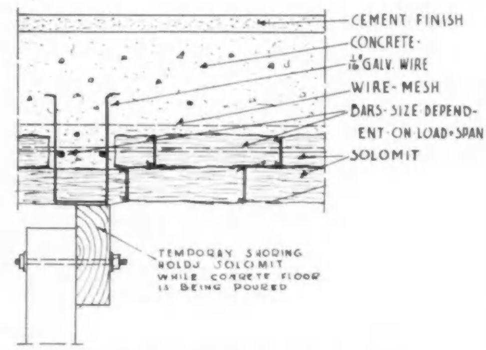
In Holland an eight-story building by the architect Van der Vlugt has a double wall of rustless alloy. This curtain wall is attached to and supported by the cantilever concrete floor construction (see pages 384 and 386-90 for details).



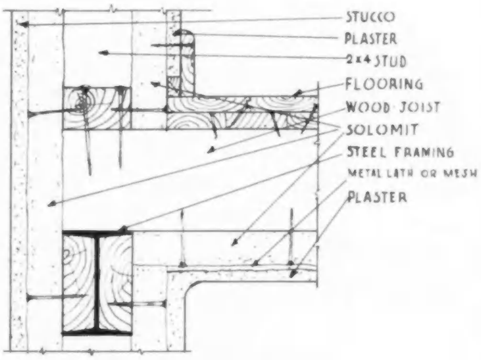
LIGHT WEIGHT WALL AND ROOF UNITS



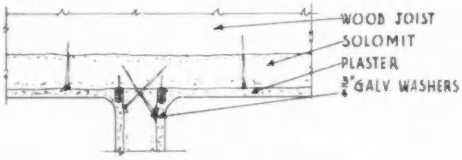
GYPSUM BUILDING UNITS



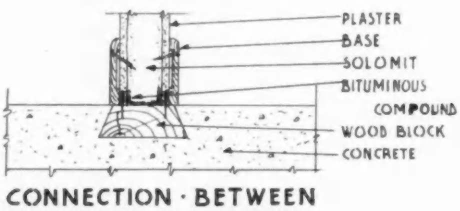
FLOORING · DETAIL. (SOUND PROOFING)



CONNECTION · BETWEEN OUTSIDE · WALL · & · FLOOR.

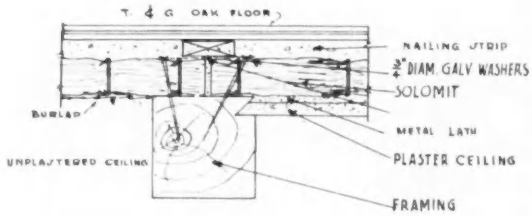


CONNECTION · BETWEEN INSIDE · WALL · & · FLOOR.

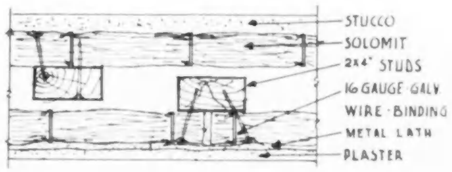


CONNECTION · BETWEEN CONCRETE · FLOOR · & · WALL.

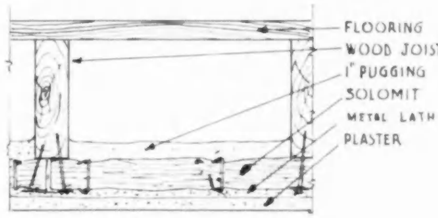
0 6" 1 FOOT



BEAMED. CEILING.



WALL · DETAIL. (SOUND INSULATED)



FLOORING · DETAIL.

SOLOMIT: A STRUCTURAL SOUND AND HEAT INSULATING MATERIAL

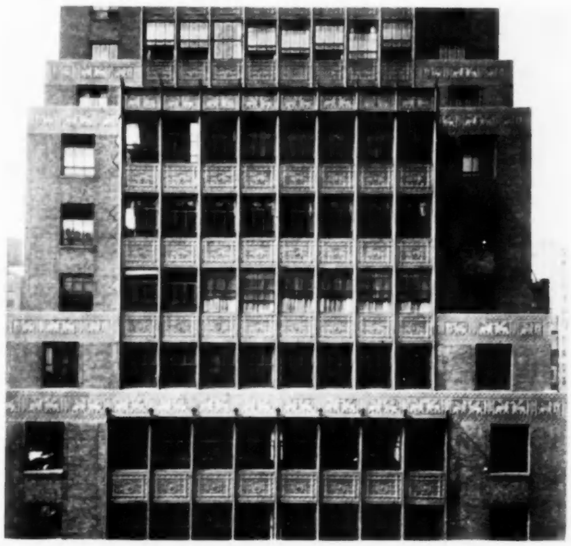
IV. ARE IMPROVED CONSTRUCTION METHODS COMMERCIALLY PRACTICAL NOW?

Yes, if the architect has initiative, a sympathetic understanding of construction problems and can design without adhering too closely to past construction methods.

A *simple illustration of one phase* of the problem is the improvement of metal spandrels.

CAN A METAL SPANDREL WITH TWO INCHES OF INSULATION BE SUBSTITUTED FOR A TWELVE INCH BRICK SPANDREL?

Metal spandrels (panels between piers) have been used for many years in building but not in a logical or economical manner. Certainly 9" or 13" backing of brick is not needed to give structural strength to a cast iron or aluminum spandrel and an analysis of other factors indicate that a two-inch back-up of a fireproof insulating material would be more advantageous. A start in the direction of more logical use of spandrels is evident in several recent buildings which have spandrels with metal sills and projecting drips over the windows and in some cases the metal is carried through from floor to floor between the windows in place of brick mullions. In some instances this metal mullion is backed up with brick, but in very many recent buildings, as for example the Bricken Textile Building, New York City, by Buchman and Kahn, architects, brick back-up for metal mullions is eliminated. The next logical step would be to substitute 2" of insulating material for the 9" or 13" brick spandrel.



BUILDING WITH METAL MULLIONS
130 WEST 30TH STREET, NEW YORK CITY
CASS GILBERT, INC., ARCHITECT
JAMES STEWART CO., BUILDERS
The architectural effect would be the same if metal spandrels were also used without a masonry back-up.

As office buildings rent for three to five dollars a square foot a year, the use of a spandrel wall which occupies two inches in place of one which takes thirteen or fourteen inches adds an appreciable amount to the net return from a building.

The question naturally arises as to the value of this additional space under windows if masonry walls on either side are 13" thick.

CAN THE MASONRY WALLS BE ELIMINATED ENTIRELY?

It is the opinion of some of the leading architects of Europe and America that it is entirely practical to eliminate masonry by using metal mullions as in the building by Cass Gilbert (see illustration below) or in the *Bauhaus* (page 361). Or if one desires to have solid walls for the architectural effect one may use metal panels between the metal mullions.

SHOULD THE INTERIOR WALL BE OF METAL?

If the interior partitions are to be plastered, the logical thing would be to apply metal lath and plaster to the insulation. If, on the other hand, the building is to have metal office partitions, and an ever increasing number of buildings are thus divided, the logical interior finish for the spandrel and wall panel would be metal to correspond with the office partitions. The objection may be raised that this surface will become damaged by other trades such as plastering and painting. This danger can be overcome by eliminating these trades from the building. The ceiling can be made of properly designed metal panels.

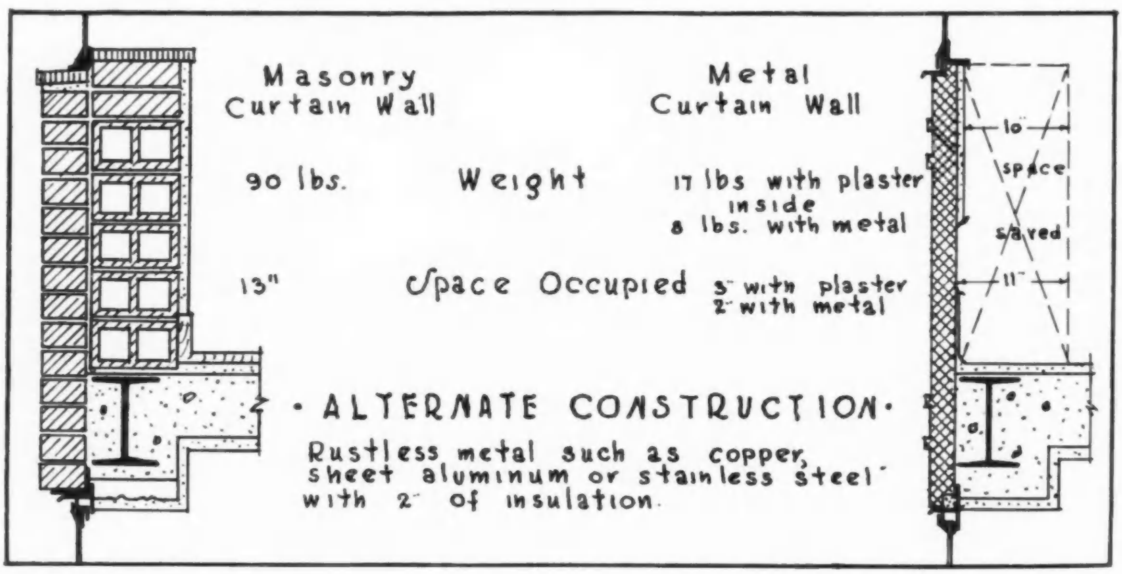
With the addition of special column-form units, it should be possible to build the average office or apartment house at the rate of a floor every two days or with a rapid setting cement to build a floor a day. Starting with the second floor the process would be as follows: wall units, finished ceiling forms and interior partitions would be erected with the insertion, where required, of metal column forms; as soon as these units are placed for a portion of the building the pouring of concrete can start. The process is repeated for the next floor as soon as the concrete has set sufficiently to bear the additional weight.*

All interior partitions would be movable so that

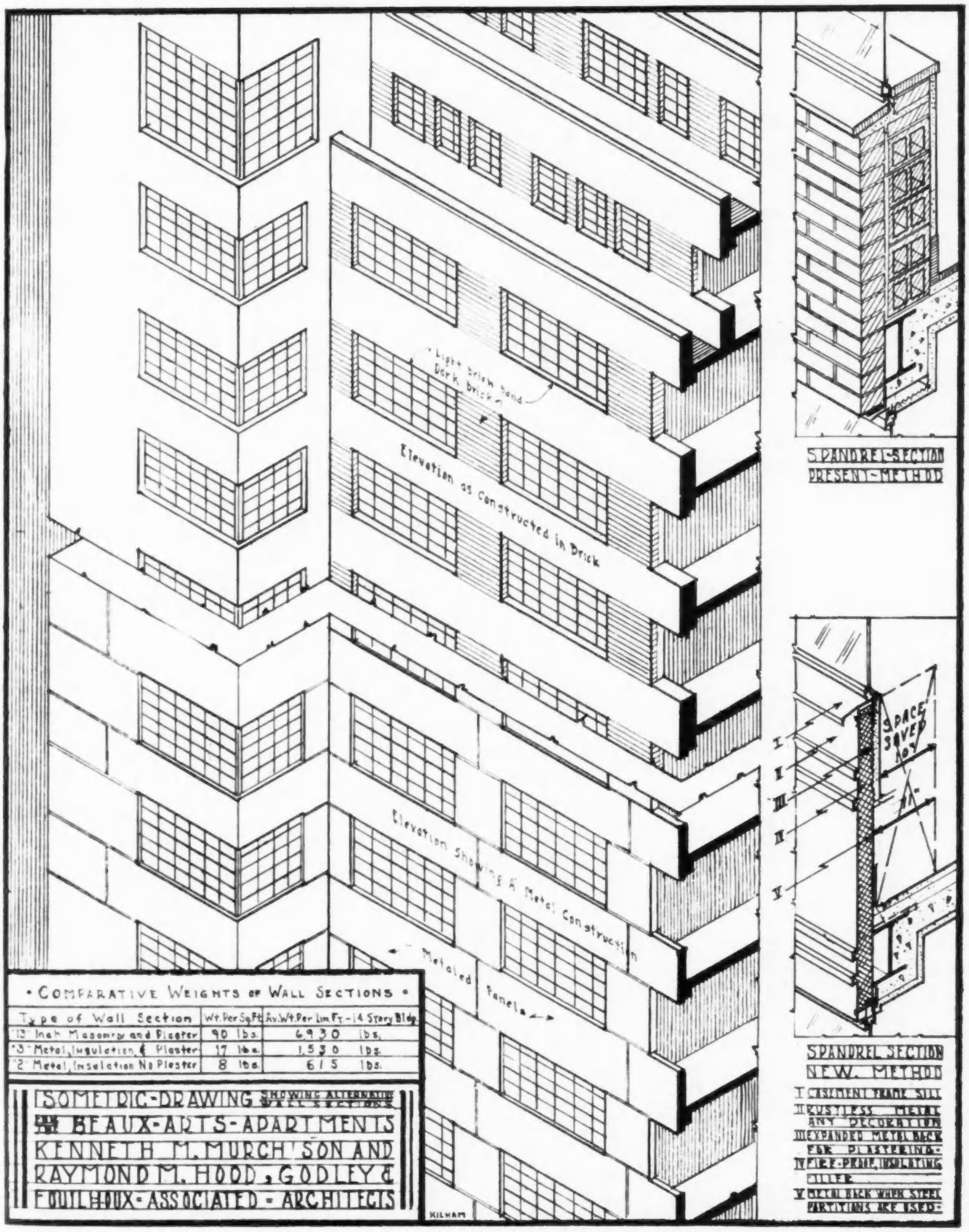
*It is recognized that there are problems of drying the concrete, provision of space for electrical conduit, heating pipes, etc., but these are easily solved if one has initiative and does not try to follow precedent only.

BEAUX-ARTS APARTMENTS, 317 East Forty-fourth Street NEW YORK CITY

KENNETH M. MURCHISON AND RAYMOND M. HOOD, GODLEY & FOUILHOUX, ASSOCIATED ARCHITECTS

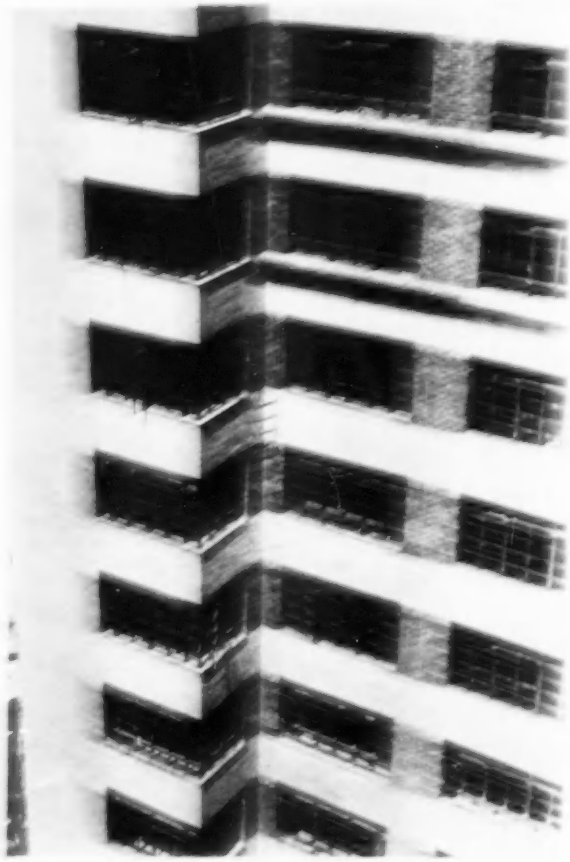


ECONOMY OF METAL WALL CONTRASTED WITH INEFFICIENCY OF MASONRY

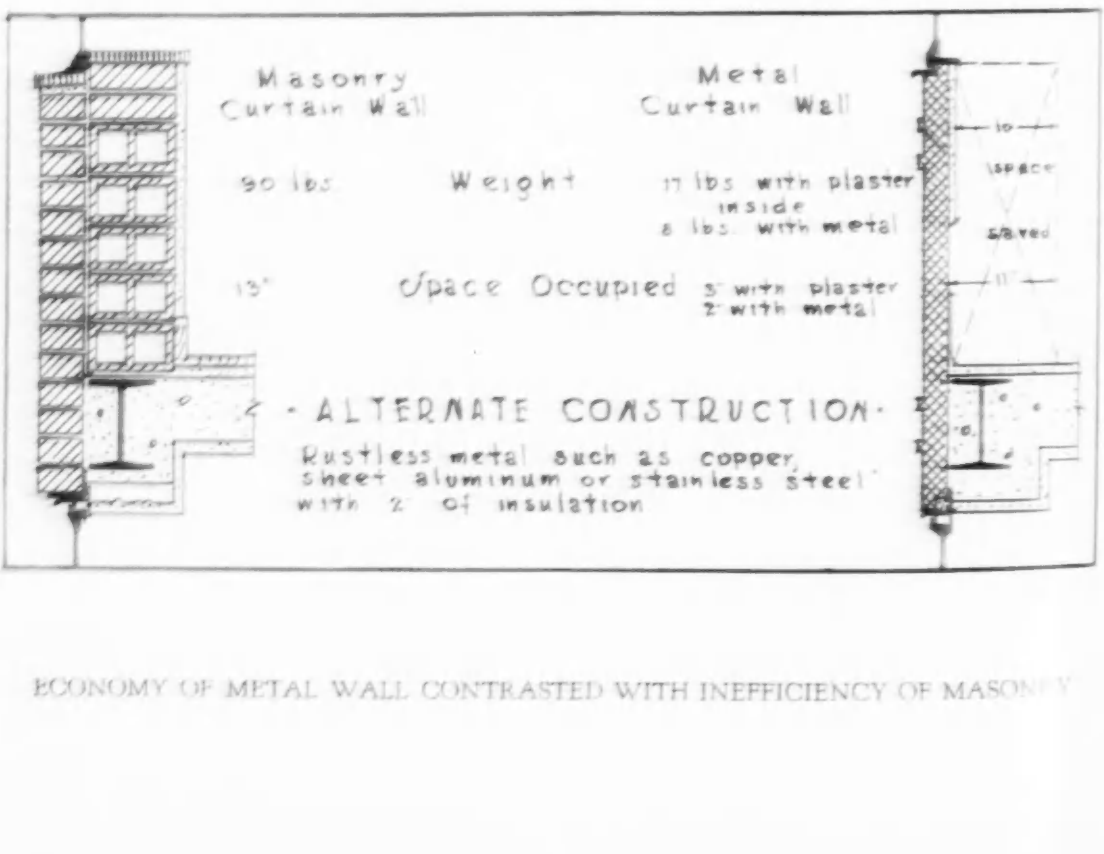


COMPARATIVE STUDY OF MASONRY AND METAL WALL CONSTRUCTION

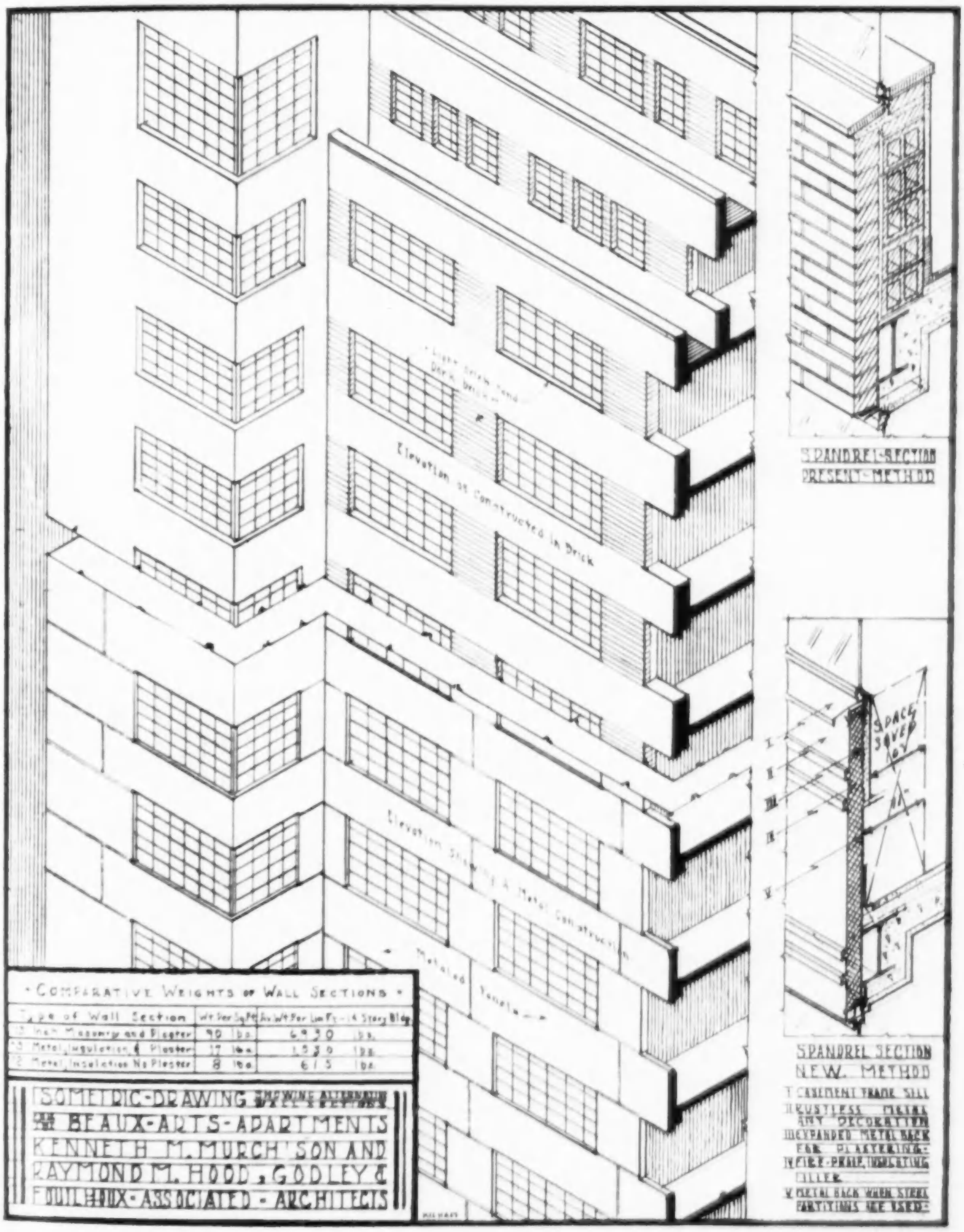
BEAUX-ARTS
APARTMENTS
317 East Forty-fourth Street
NEW YORK CITY



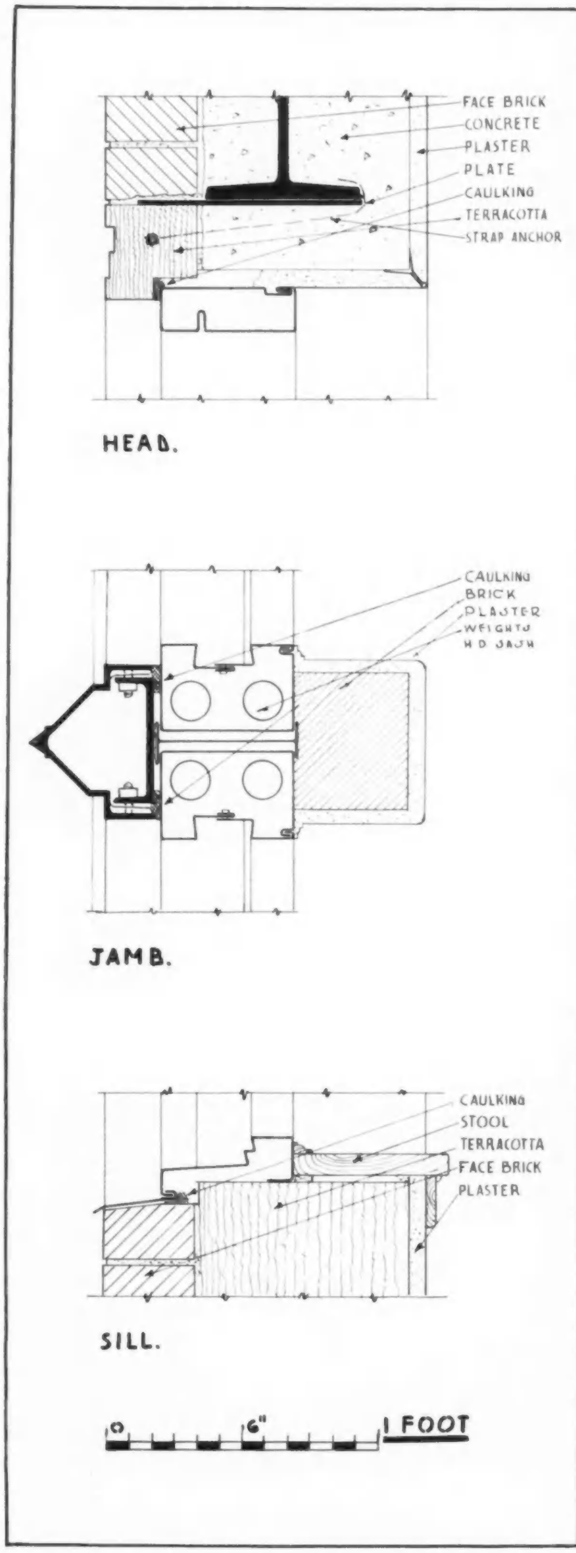
KENNETH M. MURCHISON
AND
RAYMOND HOOD,
GODLEY & FOUILHOUX
ASSOCIATED ARCHITECTS



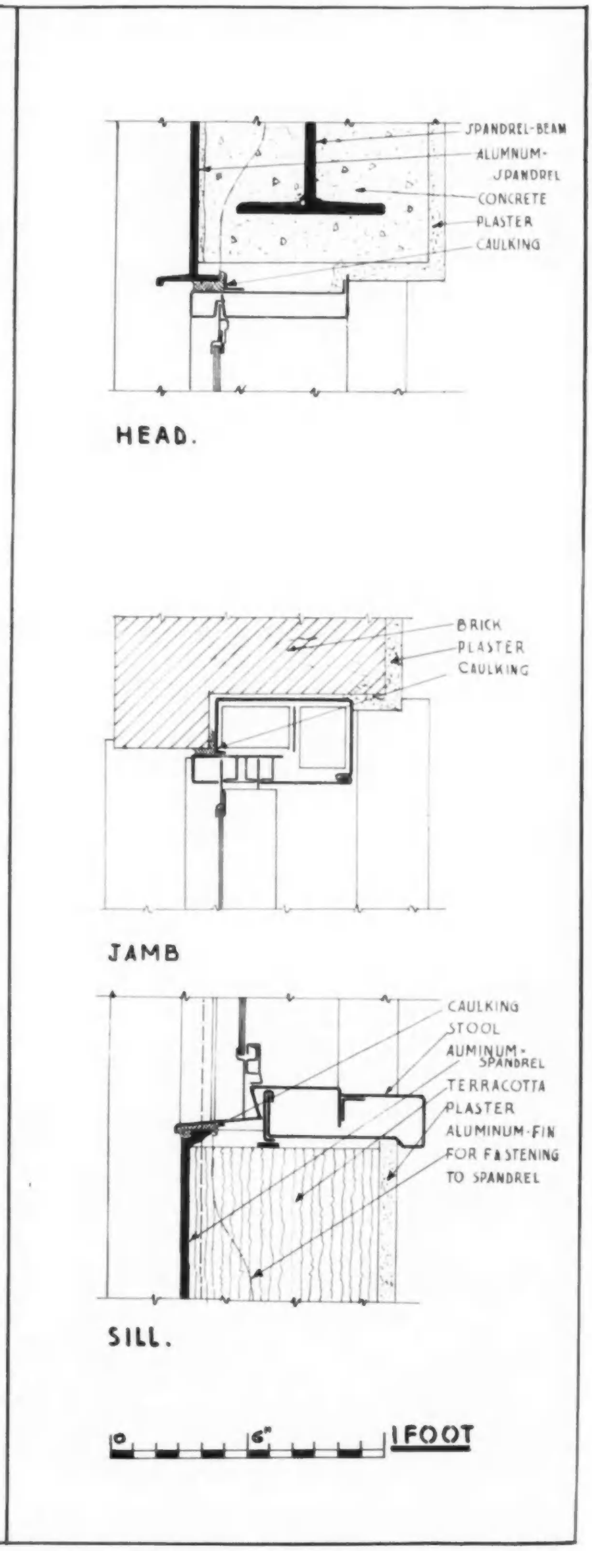
ECONOMY OF METAL WALL CONTRASTED WITH INEFFICIENCY OF MASONRY



COMPARATIVE STUDY OF MASONRY AND METAL WALL CONSTRUCTION



WINDOW SECTIONS IN LOFT BUILDING
130 WEST 30TH STREET, NEW YORK CITY
CASS GILBERT, INC., ARCHITECT



SECTION SHOWING ALUMINUM SPANDREL
CHRYSLER BUILDING, NEW YORK CITY
WILLIAM VAN ALEN, ARCHITECT

the interior arrangement may be changed to suit varying needs of different tenants.

V. HOW NEARLY WOULD SUCH A BUILDING MEET THE "QUALITIES DESIRED IN A BUILDING"?

A. COMFORT FACTORS

Although metal walls would not provide all the comfort factors desired in ideal building, they would show an improvement over present construction methods in several items with apparently no counter-balancing objectional qualities. Considering the points where they differ from present practices, the following questions arise:

WILL METAL WALLS ELIMINATE LEAKS?

Building owners complain of leaks in the walls of high buildings. Leading architects and builders maintain that this is very difficult to prevent on account of the structural weaving of high buildings caused by wind, temperature changes and vibration. An official of a large construction company states that in judging the suitability of a material for use in place of brick for exterior walls he would allot fifty out of a hundred points to the waterproof qualities of such a material, dividing the remaining points among the items of insulation, cost, appearance, speed of erection and the like.

In this connection one might visualize the relative weatherproof qualities during a twelve-hour driving rain of a brick wall, a metal wall, a house, a ship, enclosed car or airplane cabin.

Metal has been used successfully for centuries as a waterproof covering for buildings, generally on flat roofs but sometimes on side walls by Mansard and others. (See pages 355, 367, 383 for modern examples.) *It will, however, require ability on the part of designers to use it for walls of modern buildings.* Most existing metal buildings are the development of the manufacturer or the engineer and not of the architect.

WILL THE BUILDING BE TOO COLD?

Wall	*Approximate Heat Loss*
Metal walls, 2″ of insulation such as mineral wool, rock cork, solomit, torfoleum	.125 B.t u.
Brick wall, 13″ and ½″ plaster	.263 B.t.u.

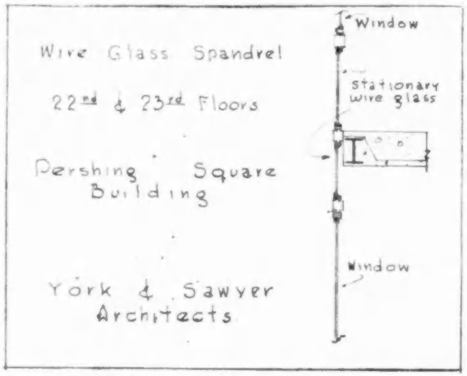
A material with low conduction value should be placed between metal connecting interior and exterior faces, as in some steel car construction.

Approximately eight hours are required to bring the interior surface of a 13″ brick wall to room temperature (utilizing twice the amount of heat that is required to maintain an even temperature once the wall is warmed), whereas approximately only ten minutes will be needed to bring the inner surface of a double metal wall (with 2″ insulation between faces) to room temperature.

WILL THE PARTITIONS AND ROOMS BE TOO NOISY?

Recent experiments by the Bureau of Standards with sound insulation of airplace cabins have shown that two light sheets of metal with a sound insulation between give results superior to the average partition.

The ceiling panel, if constructed of perforated metal backed with an insulating and sound absorptive material, will absorb more than twenty times as much sound as a smooth-plastered ceiling.



WIRE GLASS SPANDRELS PERMITTED BY NEW YORK BUILDING CODE

B. ENGINEERING FACTORS AND BUILDING CODE REQUIREMENTS

The method under discussion does not depart from accepted principles for framing or floor construction and its only effect on these items is a considerable reduction of the load which floors and columns have to carry.

In like manner it does not affect the fundamental fireproofing of the structure, all steel work receiving the necessary thickness of fireproofing. The columns may be set back from the outer walls as is customary in many of the newer industrial buildings on account of the greater economy of cantilever floor construction.

The primary difference in this construction would be the substitution of two sheets of metal and two inches of Torfoleum or other insulating material in walls where plain or wired glass is now permitted. Wired glass has a one-hour rating and double metal walls with 2″ of insulation as used in fire doors have approximately a two-hour rating.

WILL SUCH A CONSTRUCTION MEET THE REQUIREMENTS OF FIRE INSURANCE AND CITY CODES?

The fire insurance interests believe that all new material or new adaptation of materials in building construction are susceptible to tests to determine their suitability. For the purpose of making such tests, the stock fire insurance companies maintain the

Underwriters Laboratories in Chicago. Tests of a method such as suggested should be conducted before the material is used in a building. Such tests would be similar in many respects to tests of fireproof doors.

As to the probable attitude of the building departments the following from the New York City Code is illuminating:

Section 351, Article 17: "Any material or form of construction that will resist the action of flame and a heat of seventeen hundred degrees Fahrenheit for at least two hours, without raising the temperature of the material to be protected above five hundred and fifty degrees Fahrenheit by transmission through a thickness of *two inches* as determined by test prescribed in the rules adopted by the Superintendent of Buildings."

WILL SUCH A METHOD PASS THE BUILDING DEPARTMENT?

If the building departments are inclined to lean too heavily on precedent, and most of them do, relief may be obtained from a Board of Appeals where such exists or a revision of the code by the city council. Action might be brought in court requiring the building department to show good cause why metal with twice the fire resisting rating of wire glass should not receive the same treatment as wire glass.[1]

A sub-committee revising the building code of the City of New York has definitely considered the possibility of metal walls and has recommended that the following paragraph be inserted in the proposed code to take care of such new methods:

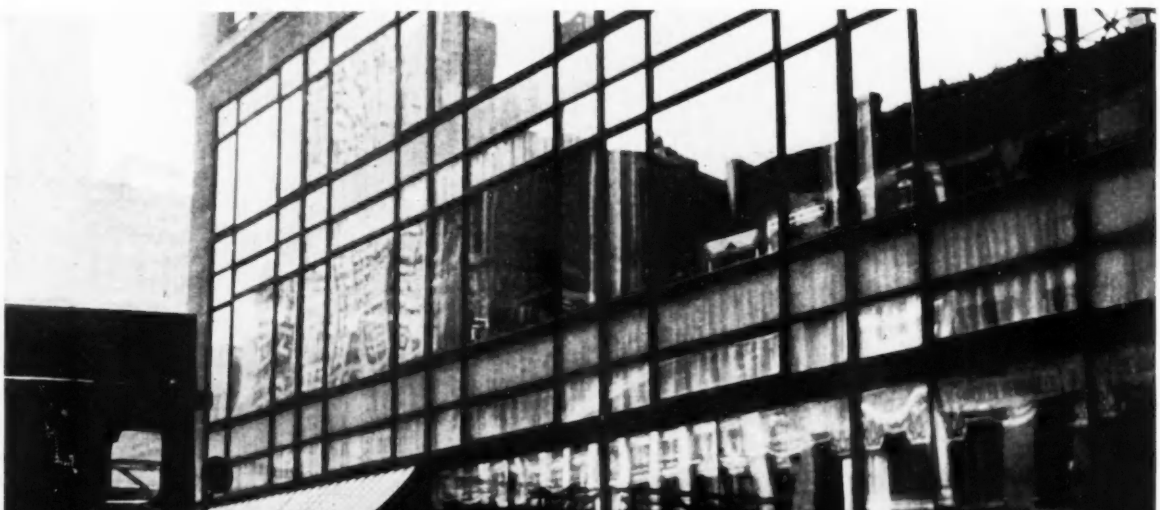
"Curtain Walls of Metal Frame Buildings shall be non-bearing and shall be supported at each story height, in general, by beams or girders.

"They shall be constructed of . . . such other materials and forms of construction as may be approved by the Superintendent of Buildings. . . ."

"The stresses due to the weights of material and forms of construction and the wind stresses shall be properly transmitted to the structural metal frame.

"The Superintendent of Buildings may within his discretion permit consideration of the curtain wall material and construction as transmitting its own

(1) Protection of Exterior Openings. N. Y. City Building Code, Sec. 375, Article 4. Vertical Separation of Windows. In fireproof and non-fireproof business buildings hereafter erected, over forty feet in height, exterior openings above the second story that are located vertically above one another and that do not require any protection under this section, shall have not less than three feet of solid masonry between the top of one opening and the bottom of the one next above, and no such opening shall be arranged to open within one foot of the ceiling of the story in which it is located, provided, however, that part of such masonry between openings *may be replaced by wire glass in fixed metal sash and frame.*



CURTAIN WALL OF GLASS
BUCKLEY-NEWHALL BUILDING, 1071 SIXTH AVENUE, NEW YORK CITY
JOHN B. SNOOK SONS, ARCHITECTS

weight *and the wind pressure upon it direct to the structural frame.*"

The revised code has not yet been adopted by the city.

It is suggested that if the manufacturers, who would profit most by the use of metal walls, were to obtain the approval by the Building Code Committee of the Department of Commerce and The National Board of Underwriters of standards to apply to metal wall panels, the use of their materials in other cities would be facilitated and the architect assisted.

C. ECONOMIC FACTORS

Metal wall construction has some of the desirable economic factors although such a method will have to be developed to a considerable degree before it shows decided economic advantages. It seems to offer possibilities which are not inherent in old construction methods.

This form of a wall lends itself more readily to complete machine production than a wood, steel stud or block wall with plaster or wall board.

Unquestionably, factory finished partitions or exterior wall units would reduce field labor to a minimum. The only question would be as to the other elements, such as floors, columns and equipment. No attempt will be made at this point to discuss these features of a building but it is entirely practical for houses and apartments of limited height to use floor and column units, factory finished, including fireproofing. A start in this direction is indicated in the report by Jack Singleton, Assoc. M. Am. Soc. C. E., District Engineer, American Institute of Steel Construction.*

Maintenance costs of a rustless metal wall which eliminates damage from leaks would probably be less than for a brick wall although this factor is open to question. Interior metal walls would probably have a lower maintenance cost than plaster walls.

Weight being one of the major factors in transportation, any reduction in weight tends to simplify the transport problem. A metal wall with twice the insulation value of a 13" brick wall will have only five to ten per cent the weight.

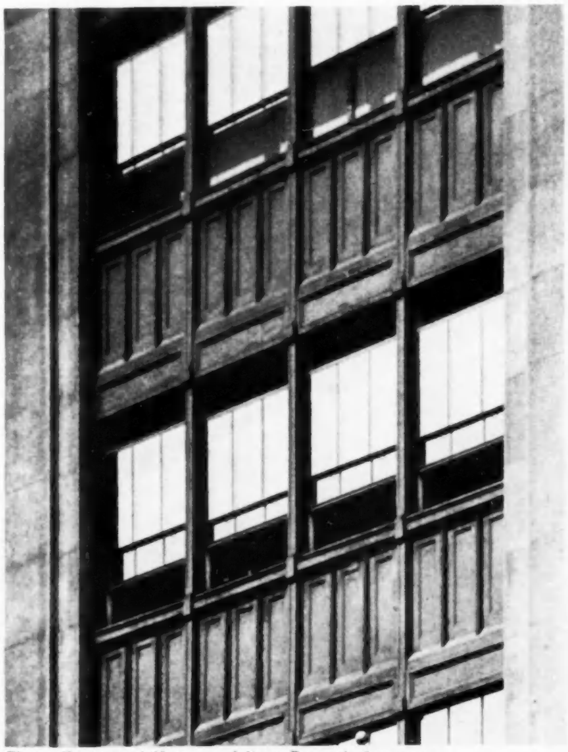


Photo. Courtesy of Copper and Brass Research Association

SHEET COPPER MULLIONS AND SPANDRELS
MACY ANNEX, NEW YORK CITY
ROBERT D. KOHN, ARCHITECT

Units such as these under consideration are sufficiently light so that they can be handled without the need of special equipment. The most serious drawback would be the danger of damage in shipping, but since it is possible to ship plate glass and metal office partitions, it may be assumed that the same shipping methods or modified forms may be developed for these units.

WILL SUCH A CONSTRUCTION METHOD BE MORE ECONOMICAL?

At the present time there would not be any considerable saving but such a method offers possibilities of quantity production and accompanying reduction in costs not inherent in old methods.

When one considers all the overhead and sales costs involved in one square foot of ordinary wall, it would seem quite probable that the substitution of a single manufactured product would be in the direction of reduced overhead charges.

It is recognized that sales financing plays an important part in the problem. Suffice it to say at this time that large scale production under centralized management with proper control of various risk features will probably permit lower financing charges.

D. AESTHETIC POSSIBILITIES OF NEW MATERIALS

So far we have been considering new materials in terms of "the practical." But aesthetic qualities are also considered by the architect in his selection and use of these materials. The experimental architect frankly seeks effects as well as practical efficiency. Texture is featured at times as in his treatment of

*"Fireproofing Structural Steel."—American Institute of Steel Construction.

wall surfaces and floors. Occasionally two materials such as concrete and brick are contrasted. Color may be considered to be of paramount importance in selecting roof material. All the art of the building craft is drawn upon in order to attain "effects" of mass, pattern, color, texture and shadow.

The modern architect is aware of changed conditions which demand economy and truthful expression in present-day buildings. The spirit of the age, which is clearly dominated by the machine and mass production, makes necessary the adoption of machine-made products, considered in the light of their aesthetic effects, steel, copper, aluminum and alloys, terra cotta, tile concrete as light as wood and having the virtues of fireproofness, sound and heat insulation, glass with health-giving qualities—all are added to the architect's palette. These products of the machine are to be used more and more frankly, first for their inherent structural and economic qualities and secondly for their aesthetic attributes.

Photo. Kamman

VAN NELLE TOBACCO FACTORY
J. A. BRINKMAN & L. C. VAN DER VLUGT, ARCHITECTS

Walls are composed of units one meter in length and the height of one story. These units are two sheets of zinc-plated steel, with 1.2 inches of *Torfoleum* insulation between, which is equivalent in value of insulation to 17 inches of brick wall. —*Van der Vlugt.*

VI. TO WHAT TYPES OF BUILDING CAN THIS METHOD BE APPLIED?

Industrial buildings are frequently built of corrugated or pressed metal. A method such as suggested would be an improvement in the insulation and appearance of such buildings. It could also be combined with industrial buildings having concrete floors.

Commercial buildings now using metal partitions, metal windows, metal spandrels and in some cases, metal acoustical tile for ceilings, might logically be *completely* built with metal units.

Apartment houses, in the opinion of some housing specialists and architects, offer a specially promising field for new construction methods. It might be argued that renters would not wish to live in rooms having metal walls but metal walls can be given practically any finish that is now given to plaster walls. If desired the walls can be covered with wall paper although there would seem to be no real reason why this should be done aside from influence of tradition. The trend of modern art, architecture and interior decoration is to glorify modern uses of products such as glass and metal. Baths and kitchens of porcelain enameled sheet metal or one of the new stainless metals would certainly be entirely practical and at the same time beautiful. The elimination of plaster will show a very real saving in cost of maintenance.

Another point on which there is opportunity for improvement is the further expansion of the kitchen cabinet principle. A few years ago the kitchen cabinet was a simple single unit. A variety of cabinets have been developed including stove and ice box units, so that today the kitchen assemblies contain everything that goes in the kitchen. These units extend from the floor to the ceiling and in some cases cover all the walls of the kitchens. It is not a difficult step to substitute these units for partition walls. In like manner wardrobe and dresser units may be used between bedrooms in place of plastered walls. (For sound proofing refer to experiments in sound proofing airplane cabins by U. S. Bureau of Standards.)

Residential work. One must face the fact that the great majority of houses are in reality not the well designed and well built houses of Colonial or English tradition suggested by the word home, but flimsily built boxes turned out by the mile by speculative builders without the benefit of an architect. In this low cost field lies a great opportunity for the architect, not as a designer of individual houses but as architect for development corporations.

The possibility of the individual architect making radical reduction in cost through improvements in construction methods of houses for the average man seems very slight. Improvements in this class of buildings will probably have to be developed through central research organizations such as the Reichsforschungsgesellschaft Für Wirtschaftlichkeit Im Bau-und Wohnungswesen E. V. which has $2,000,000 a year income from the German government, the Building Research Board in England which has a working fund of $160,000 a year. Our own Bureau of Standards does some testing of materials but is not working on the problem as a whole. America needs a research organization to solve this difficult and pressing problem. Such an organization could be financed by an endowment fund. An alternate course would be the establishment of such research by building material producers either collectively or individually.

As to the opportunities for the architect in such development, the opinion of Lewis Mumford as expressed in his article in the January issue of the Creative Arts Magazine is of special interest as it comes from an entirely independent viewpoint and approach to this subject. He says: "If the decision against conspicuous waste cuts the designer off from the single wealthy patron, let him be consoled by this: the community as a whole is a much wealthier patron, and once it begins to be well-housed and furnished—even a 'prosperous' country like the United States is far from such a general goal—once it begins to demand modern and well-designed houses, as it now demands its 1930 model car, *there will be more work for the artist in the factory than he has dared to dream of for many a century, as he waited in the ante-rooms of the well-to-do.*"

ADDENDA

Studies of the National Bureau of Economic Research[1] indicate that 86% of those gainfully employed in the United States receive an income of less than $2,000 a year. Based on facts shown in the survey, "The Cost of Living in the United States,"[2] made by the United States Department of Labor, and family income studies contained in the "Report of Commission on Regional Planning"[3] by the state of New York with adjustment for 1928 income level, it is conservatively estimated that the average family income (where the heads of families receive under $2,000) is approximately $1,550 and that at least 69% of the families receive a total income under $2,000.

According to the Bureau of Municipal Research[4] and other studies, a family receiving $2,000 a year or less cannot afford to pay over $336 a year for rent. (This is a higher per cent for rent than is paid by the average family.)[5] To rent or sell for this $336 a year the dwelling complete (rent capitalized at 10%) must cost less than $3,360. (According to competent authorities the yearly rent should exceed 14% of the cost of the property to make such an investment profitable;[6] on this basis the capitalized rent would represent a total cost for dwelling and land of $2,400.) At the present time, aside from cottages in the country, it is impossible to build four rooms with land and improvements for $3,500 or less.[7]

The Report of the State Board of Housing, New York, March 6, 1929,[8] contains verification of this view in the following statement which, while applying to New York, indicates the trend in the country as a whole: "Less than 3 per cent of the total new construction in the year 1924 was offered at rents of $12.50 per room per month or less. Ninety-seven per cent of the total construction was available only to that 30% of all families of the city whose annual income is in excess of $2,500." (Both income and rents are higher in New York than in the country as a whole.) "Moreover, the Commission showed that no opportunity for home ownership is available to families earning less than $2,000 per annum." The State Housing Law, through tax exemption, aims to bring adequate housing within the economic reach of those families having an income under $2,500.

A study of small house construction by the Division of Building and Housing of the Department of Commerce in which agents visited some 38 cities during the past year brought out the fact that in some rapidly growing communities, such as Oklahoma City and Flint, houses are being built at lower prices than in many other cities. In Flint, one-story five-room bungalows are built 22′ by 26′, selling for $3,300 *above the land* (no basements). In Oklahoma City builders sell for $4,050 above the land.

Market possibilities (based on 1920 incomes):	Total Income	Available for Housing
Present construction reaches individuals receiving $2,000	$25,448,000,000	$6,000,000,000
Lower construction costs would reach some of those receiving under $2,000	43,854,000,000	10,000,000,000

[1] "Income in the United States. Vol. II. National Bureau of Economic Research, 1922." Pages 253 and 270.

[2] "The Cost of Living in the United States." U. S. Dept. of Labor. No. 357. Page 4.

[3] "Report of Commission of Housing and Regional Planning," State of New York. Dec. , 1923. Page 68.

[4] "Proceedings of the Philadelphia and National Conferences on the Construction Industries." The National Federation of Construction Industries, Philadelphia, Pa. April 15, 1921, Page 81.

[5] "Monthly Labor Review." Aug., 1919. Page 118.

[6] "Proceedings of the Philadelphia and National Conferences on the Construction Industries." The National Federation of Construction Industries, Philadelphia, Pa. April 15, 1921. Page 50.

[7] "Minimum Cost for Low-Rental Apartments." Alex. M. Bing. Journal of Land and Public Utility Economics. May, 1929. Pages 115, 116, 124.

[8] "Report of the State Board of Housing," State of New York. March 6, 1929. Page 25.

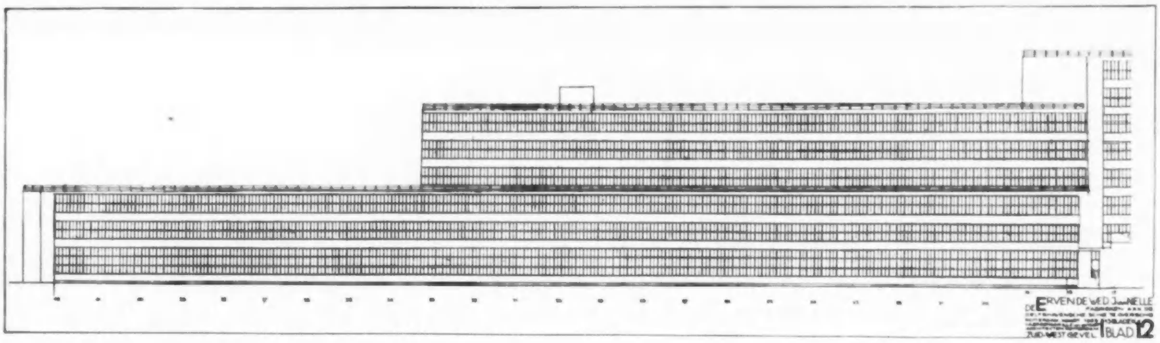


Photo. Kamman

VAN NELLE TOBACCO FACTORY, ROTTERDAM, HOLLAND

J. A. BRINKMAN AND L. C. VAN DER VLUGT, ARCHITECTS

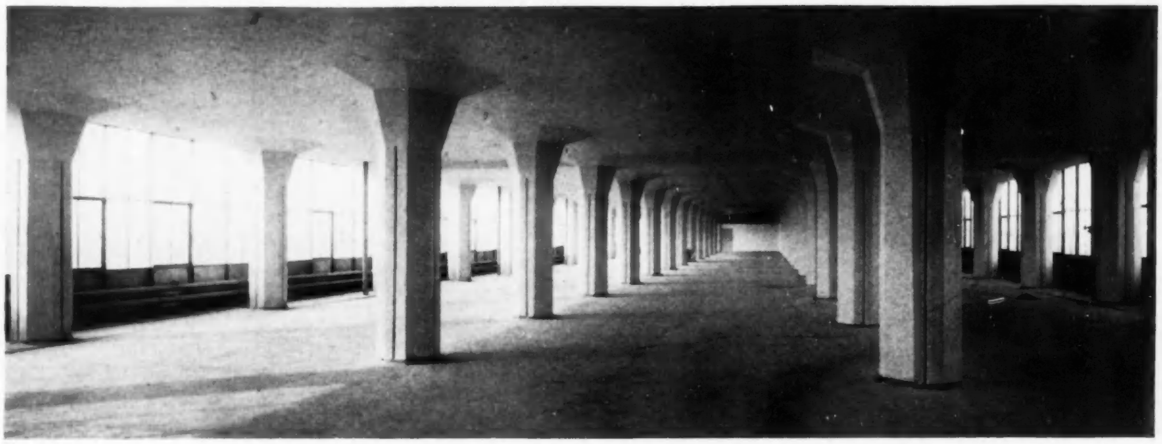


Photo. Kamman

INTERIOR OF WORKROOM

VAN NELLE TOBACCO FACTORY ROTTERDAM, HOLLAND

J. A. BRINKMAN AND L. C. VAN DER VLUGT, ARCHITECTS

FILLING:

In order to begin building immediately, the ground was raised 2½ to 3 meters with very pure river sand. This sand cost more than ordinary earth, but made it possible to gain time.

•

QUALITY OF SOIL:

Very peaty. At 18 or 19 meters down the sand was sufficiently firm to assure the use of piles. Only traces of humic acid were found, so there is no risk of disintegration of the reinforced concrete piles. The Portland cement was composed of granulated slag from blast furnaces.

•

FOUNDATIONS:

Reinforced concrete piles, prepared in advance, were chosen to reduce the amount of the excavation and also on account of the varying depths of the sub-soil water.

•

SUPERSTRUCTURE:

The columns and floors are all in reinforced concrete. Floors have the mushroom system, a little more expensive than beams but with several advantages: flat ceilings and additional story heights, with the result that the entire edifice has been reduced 1 meter 50 in height and giving greater economy of facades, partitions, interior separations and staircases. The columniation was chosen to guarantee maximum facilities in installing. Because the columns had to be placed one above the other, a spacing module was selected. In the tobacco factory it is 5 by 5.70 meters, in the other factories 5.70 by 5.70 meters.

The pillars are octagonal in form. The shape of the "drop panels" has been modified for architectural reasons.

Where unnecessary the mushroom flooring was omitted and beams substituted. The mushroom system in the tobacco factories has been calculated according to the measurements given by the Joint Committee of the American Concrete Institute, in the other tobacco factories, after the measurements of Marcus and Lewe. The first is the system of diagonal bracings (four-way); the second, without diagonals (two-way).

The cantilevering of the floor was estimated to lessen the bending moment in the beams and to create a kind of corridor along the facade in order to avoid having the conduits turn sharp angles. The machines are very heavy and because of the severe vibrations have special foundations placed on the ground floor.

The partitions are constructed of special aerated *korrel* concrete.

•

GENERAL PLAN:

Very simple, with eight large halls one under the other. The general passage is provided because the

Photo. Kamman

VAN NELLE TOBACCO FACTORY, ROTTERDAM, HOLLAND

J. A. BRINKMAN AND L. C. VAN DER VLUGT, ARCHITECTS

workmen come in first through the vestibules and moving forward take their places in line for the washstands. All lavatories have showers with hot and cold water. Liquid soap is sent down through a special conduit.

•

FACADES:

The exterior wall at end of building is covered with a white German plaster, *Edelputz*. Quartz fragments which reflect the sun brilliantly are used for the interior walls. The sides are composed of units one meter in length and about the height of one story. These units are of steel, two sheets with 3 cm. of *torfoleum* insulation between, which is equivalent to 44 cm. of brick wall. The sides are *schopé*, that is, covered with zinc.

The windows are placed on the outside and a special car capable of being lowered or raised is used for washing and replacing these windows. The windows are related to floor areas in the proportion of 1 to 3.8, which is ample.

The stairways are well lighted. On the roof cornice is a balustrade carrying the rail for the washing car.

To protect the plaster corners a special reinforcing was embedded in the plaster.

•

FLOOR TREATMENT:

The floors are covered with *Dermas* (a kind of yellow asphalt) 1.5 cm. in thickness, with 6 cm. of *Bims* concrete underneath. In this concrete flooring are all the cables and electric conduits.

•

STAIRWAYS:

Mason's non-slipping, grooveless treads and red *Dermas* asphalt. Brick tiles: yellow and light green.

The steel doors are painted with aluminum.

•

TEA SALON:

On the roof terrace, 36 m. above the ground, is a room, painted in blue, gold and white. Here tea is poured for visitors to the establishment.

Photo: Kamman

VAN NELLE TOBACCO FACTORY, ROTTERDAM, HOLLAND

J. A. BRINKMAN AND L. C. VAN DER VLUGT, ARCHITECTS

LIGHTING:

The metallic parts (sockets and the like) are enamelled in white.

•

VIBRATIONS:

In order to minimize floor vibration, very simple foundations for the machinery were fixed into the concrete floors, walls and columns by special reinforcements.

•

CEILINGS:

An American "surfacer" was used to polish the concrete of the very flat ceiling. Cream colored paint was used.

•

CENTRAL HEATING:

Hot water.

•

COLUMNS AND WALLS:

These were polished with the "surfacer" and an almost white paint was used. Aluminum paint was used for the steel doors and other metal parts.

MACHINES:

Painted in red, blue, aluminum and black, each series of machines being different.

•

CHROMIUM PLATING:

All door handles, the stair handrails and the electric fixtures are chromium-plated instead of nickel-plated. This is more expensive but does not oxidize.

•

CONCLUSION:

The building was not more expensive than other factories of this type because each detail was studied with the greatest care, and economy was effected by the purchase of material in large quantities.

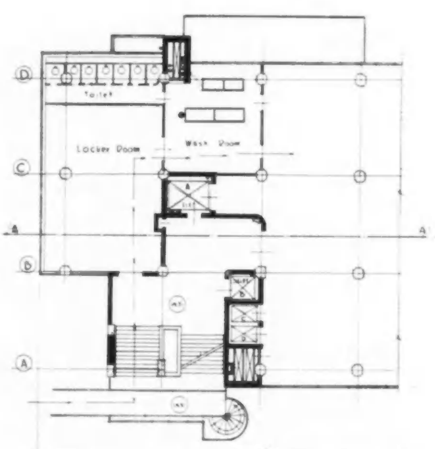
As to the inside temperature, it is sufficient to say that greater comfort is obtained here than in other similar factories, because of the *torfoleum* insulation and the *Korrel* and *Bims* concrete which are also good insulators.

On the interior of the stores, for protection against the rays of the sun on the south side, are American wood lattices, painted with aluminum.

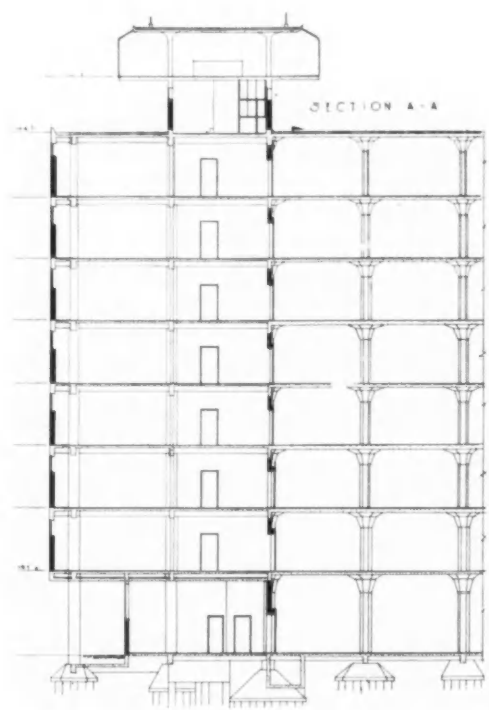
Photo, Kamman

VAN NELLE TOBACCO FACTORY, ROTTERDAM, HOLLAND

J. A. BRINKMAN AND L. C. VAN DER VLUGT, ARCHITECTS



PLAN AND SECTION OF END BAY SHOWING CONCRETE CONSTRUCTION, CANTILEVERED FLOORS AND EMPLOYEES' ENTRANCE THROUGH WASHROOM.



NOTES AND COMMENTS

REIMS CATHEDRAL

To substitute the "clean exact lines" of machine work for the free-hand work of the Middle Ages is like replacing the expressive broken lines of a drawing by Prout with those of a ruling pen. If repair of an old building is to be undertaken at all, let it be done, as far as possible, in the natural old manner. It is a mistake to speak of the nave of Reims as having been restored. It has not been restored.

On the contrary it has been only further damaged. We are told by a writer in the London Times that the architect, M. Herriot, in his remarks on the occasion of the reopening, said that when restoration was first proposed, there was objection in some quarters on the ground that the building ought to be "left in its ruined state, as an historical record." It is to be regretted that this counsel did not prevail, not merely for the sake of historical record, but for the preservation of what remained of a great work of art. But since the disastrous work of the so-called "restorer" is done, it might be hoped that no further harm would be inflicted on the old fabric. Yet extensive further "restoration" appears to be contemplated; for we are told that "there still remains the truly immense task of restoring the exterior stonework of the church, the superb decorations of which have been mutilated beyond belief." But of the destructive results of modern attempts to restore the sculptured ornaments of mediaeval monuments we have had abundant proof during the last century when Lassus and Viollet-le-Duc were given a free hand to work their will on the Cathedral of Paris. For knowledge of the principles of Gothic construction, Viollet-le-Duc has had no equal in modern times, because, with an ardent spirit and strong natural aptitude, he sought knowledge, not from books, but from the extant monuments. These he examined and compared with rare intelligence, taking advantage of the many cases where buildings had suffered more or less ruin, either from violence or decay, so as to reveal internal structure. With amazing industry, he worked with that keen delight which alone gives insight. But his enthusiasm for structure was not accompanied by corresponding aesthetic feeling. In appreciation of artistic qualities both he and Lassus were deficient, as we see in their works. Under these conditions, the incomparable sculptures of the west front of Paris—which had been extensively mutilated by the revolutionary violence—were by them wholly destroyed under the mistaken notion that they might be restored. Thus, instead of preserving intact what fragments remained of these works—letting them stand as they were for the benefit of posterity—these "experts" made, as they thought, a complete renewal of the ornaments of this noblest of French Gothic facades—which now stands as a corrupt document. Those who deal with remains of ancient Greek sculptures now realize the mistake of attempts to restore them, and scrupulously preserve intact every fragment that is found. There can be no protection of ancient works of art till this principle is observed.

Coming back to Reims, it ought to be said that as an example of French Gothic architecture, it is not by any means of the first rank. Except for the lower parts of the east end—begun in 1212—it is very inferior to the earlier works which, in the Ile-de-France, led up to the nave of Amiens—the unique embodiment of the perfected French style. Between this earliest part and the beginning of the rest, there appears to have been an interval of some forty years, during which time the art was steadily declining through the growth of florid excesses, and corresponding degeneration of both structural and artistic quality. The whole system of the nave of Reims is, in point of structure, as well as in ornament, wanting in finest Gothic character. The essential principle of French Gothic construction—a principle which differentiates it fundamentally from every other—is, I must here repeat, that of effective resistance to vault thrusts by counter thrusts of active members, not by inert masses of masonry. This requires that buttresses should be so shaped and adjusted as to give a maximum of force in the transverse direction—their bulk in the longitudinal direction being made as small as possible, in order to keep the voids between them as large as possible, as at Amiens. In the nave of Reims, these members are too square on plan, and the whole system is too heavy. If the reader will compare the system of the nave of Reims, as given in cross section by Viollet-le-Duc in the *Dictionnaire* etc., Vol. 2, p. 318, with that of Amiens, p. 329, he can hardly fail to perceive the difference and its significance.

In small details, no less than in larger things, the nave of Reims is wanting in consistent Gothic character. Compare, for instance, the compound capitals of the piers on the ground story with the corresponding ones of the nave of Amiens. It will be seen that whereas at Amiens the composition is strictly organic—the lesser members being proportionately smaller than the principal one, having their neck moldings at a higher level, at Reims the neck molding of the great member is carried round the whole group—so that the capitals of the lesser shafts are of the same height as the great one.

As for the sculpture of the exterior, none of it is of the finest quality, as a comparison with what remains intact in the portals of the west front of Paris will show. Whoever will examine what was done in sculpture in the Ile-de-France at the close of the twelfth century and during the early decades of the thirteenth, more particularly at Senlis and Paris, must see that nothing of that with which the exterior of Reims is crowded, will bear comparison with it. These remarks are made in order to put the nave of Reims in its right place among the great French Gothic monuments—which have not thus far been examined and compared with discriminations. CHARLES H. MOORE.

ADDITION TO EDITORIAL STAFF

THE addition of C. Theodore Larson to the editorial staff of The Architectural Record is announced. Larson has had a combination of newspaper and architectural experience and training. Coming from Kansas City, Missouri, he specialized in literature at Harvard University and served as news reporter on the *Kansas City Star*. As an undergraduate he received the Bowdoin and Sohier prizes in English literature. His four years of supplementary study at the Harvard School of Architecture led to his master's degree and he was awarded a Nelson Robinson, Jr., Traveling Fellowship.

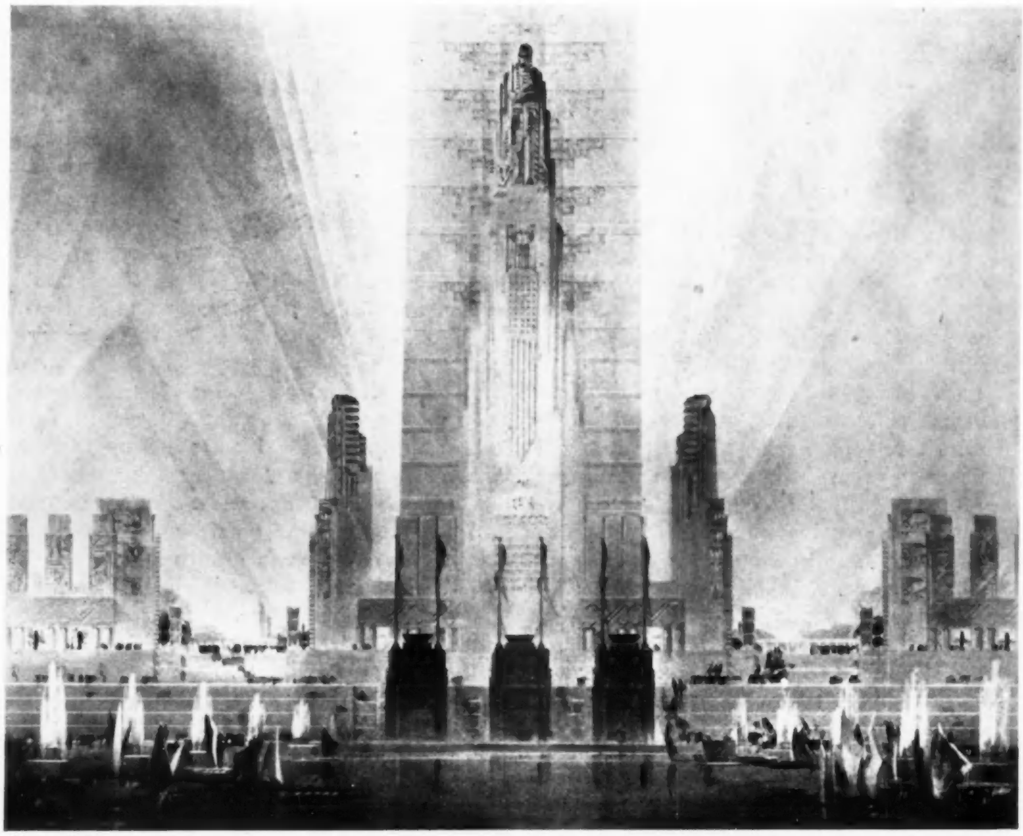


Photo. Dreyer

A MEMORIAL TO THE SPIRIT OF THE WEST

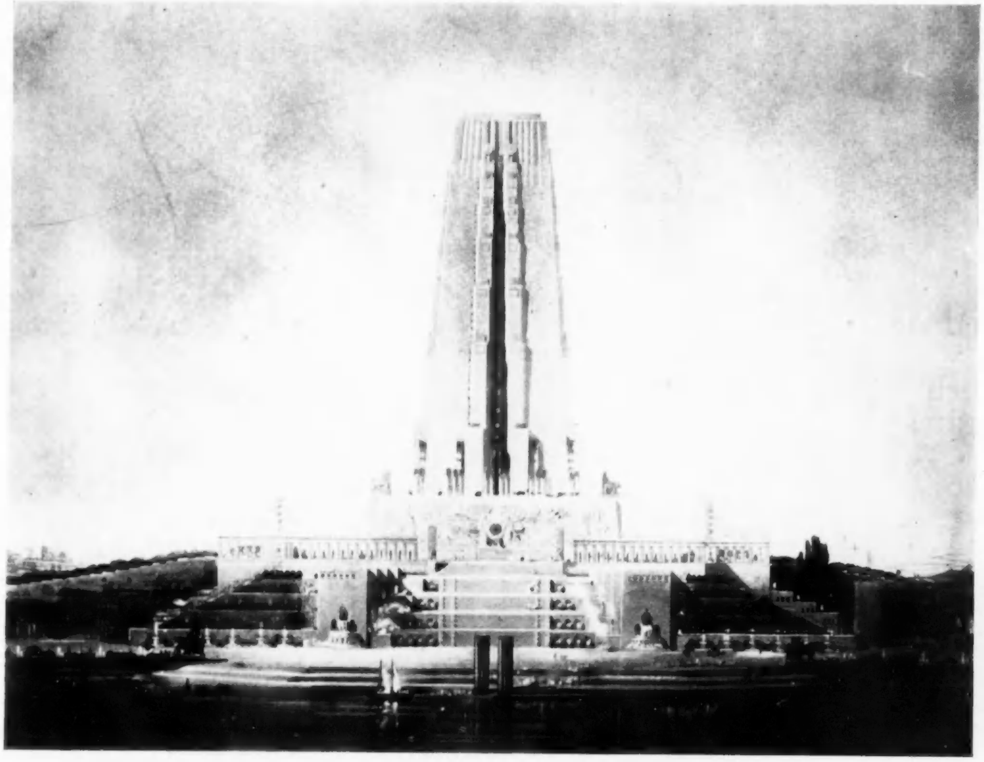
J. D. MURPHY, FIRST MEDAL, PLACED FIRST

PARIS PRIZE

J. D. MURPHY, Massachusetts Institute of Technology, has been awarded the Paris Prize of 1929, according to an announcement by the Beaux-Arts Institute of Design. The winner receives a first medal and $3,000 for two and a half years of study at the *Ecole des Beaux-Arts* in Paris. Murphy is 22 years old and a pupil of Professor Carlu at M. I. T. His home is in Kansas City, Mo.

A first medal was also given the design submitted by I. W. Silverman, who placed second in the competition. Silverman is a graduate of the University of Minnesota and The School of Architecture at Harvard. A second medal was awarded F. T. Ahlson, Yale University. The other *logistes* were Carl C. Braun, University of Illinois, and J. Edwin Petersen, Armour Institute of Technology.

I. W. SILVERMAN
FIRST MEDAL
PLACED SECOND



Photos. By Dreyer

F. T. AHLSON
SECOND MEDAL

(Continued on pages 170 and 172, advertising section)

LIST OF NEW BOOKS ON ARCHITECTURE AND THE ALLIED ARTS

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ARCHITECTURE

EBERLEIN, HAROLD DONALDSON.

Manor houses and historic homes of Long Island and Staten Island; with a frontispiece in photogravure and 75 illustrations in doubletone. Philadelphia & London: J. B. Lippincott Company, 1928. x, 318 p. front., plates. 4°. $12.50. 728

A record of local architecture and a history of individual houses, their owners, and occupants. Illustrated from photographs and old prints.

Encyclopédie de l'architecture. Paris: A. Morancé, 1928. 100 fr. each series. 724.9

Série 1. Constructions de style.
Série 2. Constructions modernes.
No text. Each series is published in albums of 100 plates, with descriptive caption on back of each plate; includes all types of contemporary French architecture, with a very few examples from other countries.

GAUTHIER, JOSEPH.

La vallée de la Loire. Paris: C. Massin & Cie, 1928. 19 p. illus. (incl. plan), 40 pl. f°. (*Manoirs et gentilhommières du pays de France.* v. 1.). 90 fr. 728.83

A special study of the "*manoir*" of the Loire section of France, outlining its chief architectural features. A list of principal examples is arranged by departments and then by century. There are line drawings in the text and a group of 40 plates illustrating 27 manors.

GOTCH, JOHN ALFRED.

Inigo Jones. London: Methuen & Co., Ltd., 1928. xi, 271 p. front. (port.), 31 pl. 8°. 12s. 6d. 724.12

Inigo Jones's books at Worcester College, Oxford, pp. 248–252. A new biography based upon fresh facts and written with special relationship to the historical background of the period.

JANNEAU, GUILLAUME.

Technique du décor intérieur moderne. Paris: A. Morancé, 1928. 213 p. plates. 12°. 25 fr. 747

At head of title: *Enseignement de l'École du Louvre.*
Sketches the beginning of the movement in France and discusses the salient features of the new forms, especially in relationship to current modes of living. There is also a brief review of the situation in other European countries.

LESUEUR, PIERRE.

Dominique de Cortone, dit Le Boccador. Du Chateau de Chambord à l'Hotel de Ville de Paris. Paris: H. Laurens 1928. iii, 195 p. illus. (plans), plates, 8°. 25 fr. 724.14

A careful analysis of the sixteenth century work and influence of this Italian architect, especially in his relationship to the general movement of the French Renaissance. Twelve plates and six text illustrations.

ONDERDONK, FRANCIS S.

The Ferro-Concrete Style; reinforced concrete in modern architecture, with four hundred illustrations of European and American ferro-concrete design. New York: Architectural Book Publishing Co., Inc., 1928. vi, 265 p. front. (col'd.), illus. 4°. $12.00. 724.9

Bibliography, p. 264–265.
The history, possibilities and probable development of concrete are discussed by Professor Onderdonk of the University of Michigan. Well illustrated by examples of many countries, and throughly indexed.

PRATT, SIR ROGER.

The architecture of Sir Roger Pratt, Charles II's commissioner for the rebuilding of London after the great fire: now printed for the first time from his note-books; edited by R. T. Gunther. Oxford: Printed by J. Johnson for the author at the Univ. Press, 1928. xi, 312 p. front. (port.), illus. (incl. facsim., plans), plates. 4°. 31s. 6d. 724.12

"The most successful architect between Inigo Jones and Wren" is here permitted "to tell his own tale." Well illustrated and indexed.

STEVENS, EDWARD FLETCHER.

The American hospital of the twentieth century; a treatise on the development of medical institutions, both in Europe and in America, since the beginning of the present century. 2nd rev. ed. New York: F. W. Dodge Corporation, 1928. xvi, 549 p. front., illus. (incl. plans). 4°. $15.00. 725.5

A thorough revision of a title first published in 1918.

WEBER, WOLFGANG.

Barcelona. Berlin: Albertus-Verlag, 1928. xx, 224 p. illus., plan. f°. (*Das Gesicht de Städte.*) 20 marks. 720.946

A series of 224 plates from photographs illustrate the varied architecture of Barcelona and its suburbs.

WILMS, FRITZ.

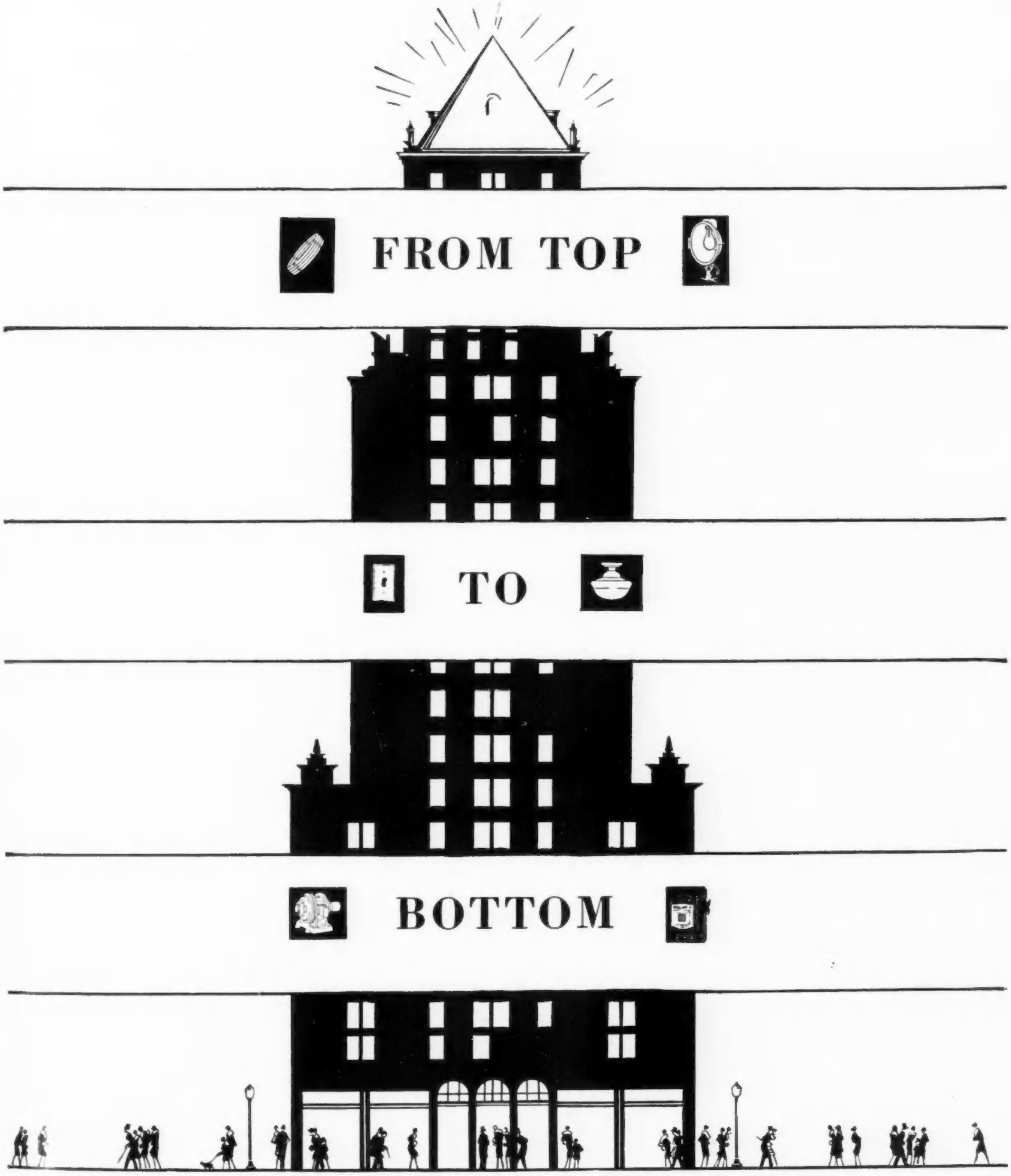
Lichtspieltheaterbauten: mit einer Einleitung von Reg.-Baumeister Dr.-Ing. Alfred Wedemeyer. Berlin: Friedrich Ernst Huebsch Verlag G.M.B.H., 1928. xvii, 39 p. illus., plans. 4°. (Neue Werkkunst). 12 marks. 725.8

Photographs and plans of recent cinema theatres by this German architect; including many Berlin examples.

YERBURY, FRANCIS ROWLAND.

Modern European Buildings. Ser. 1. London: V. Gollancz, Ltd., 1928. plans, plates. 4°. 30s. 724.9

A series of plates illustrating many recent types of architecture (excluding domestic), in Great Britain and on the Continent. Captions in English and German.



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NOTES IN BRIEF

GEOFFREY SCOTT

On August 15, Geoffrey Scott, author of *The Architecture of Humanism*, died of pneumonia in The Rockefeller Institute, New York.

Educated at Rugby and New College, Oxford, he became librarian and secretary to Bernhard Berenson, the art critic. During this period of his life he designed in collaboration with Cecil Pinsent the library for the Berenson villa, "I Tatti." At the same time he wrote the book by which he will be most remembered—*The Architecture of Humanism*—published in 1914, just before the outbreak of war. During the war he was honorary attaché and later press secretary to the British Embassy in Rome. Later he published *A Box of Paints*, a volume of verse with drawings by Albert Rutherston, and in 1925 his *Portrait of Zelide*. It was while he was in America engaged in the editing of the recently discovered *Boswell Papers* and the writing of a life of Boswell that he died at the age of forty-six.

The Architecture of Humanism, as a document of architectural philosophy, is a scholarly piece of graceful writing. It diagnoses and analyses the cardinal fallacies that stultified architectural theory during the nineteenth century, and in addition to rendering a true appreciation of the Baroque, developed a thesis regarding humanistic values in architecture which will always have to be considered in any future treatment of the subject.

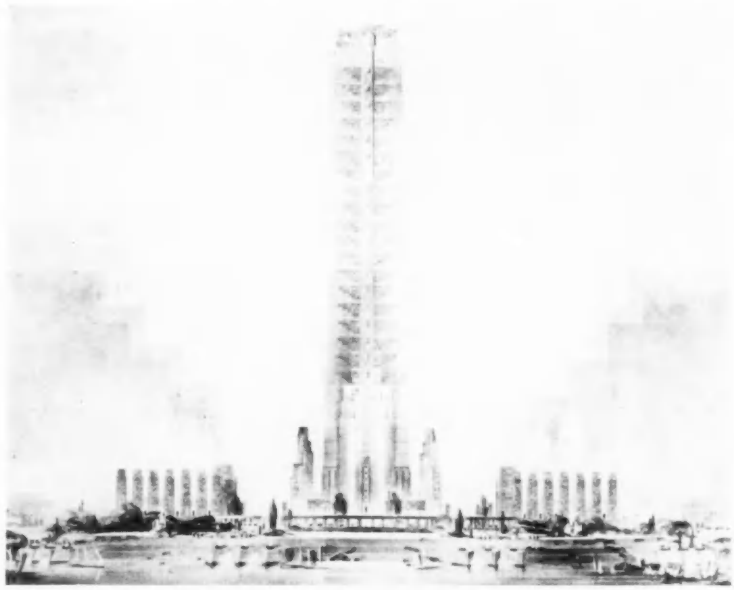

Photo. Dreyer

MEMORIAL TO THE SPIRIT OF THE WEST
J. D. MURPHY, PARIS PRIZE WINNER

•

ARCHITECTS' CONGRESS IN BUDAPEST

The twelfth season of the International Architects' Congress will be held during September, 1930, at Budapest, Hungary. The program will include discussion of the reform in the system of architectural education, with special stress on the economic viewpoint and the rational management of work; the beautifying of factories and industrial plants in keeping with the general development of the city; the construction of buildings on territory where earthquakes occur; traditional architecture and modern architecture.

The president of the executive committee of the congress is assistant Secretary of State, Robert K. Kertesz. The congress will be connected with an international exposition of architectural plans, in which several countries have already assured their participation. The executive committee will furnish on request any further details as to facilities and arrangements. The address is Realtanoda utca 13-15, Budapest, IV, Hungary.

FINAL ANNOUNCEMENT OF A COMPETITION FOR A WAR MEMORIAL, CITY OF CHICAGO

The Chicago War Memorial Committee, a group of leading citizens, offers a first prize of $20,000 and a second prize of $5,000 to designers of a War Memorial to be located on the shore of Lake Michigan at the extension of Congress Street.

The Jury of Award will comprise Mr. Abbott, Col. McCormick, Col. Savage, Mr. Simpson and Col. Sprague as lay members, and Harvey W. Corbett, Ernest R. Graham, John Mead Howells and Dean Everett V. Meeks as professional members.

The War Memorial Committee of the city of Chicago proposes to erect a memorial dedicated to those who served in the World War. It will occupy a most important position on the shore of Lake Michigan and at the termination of Congress Street, the principal axis of the city of the future.

It is the desire of the Committee to obtain a design which, when built, will adequately memorialize the sacrifices of all who served in the war and in a manner relating not inharmoniously to the adjacent architectural and landscape elements of Grant Park and the Yacht Harbor.

The competition is to be nation-wide and is open to qualified architects residing in the United States. Eleven architectural firms are especially invited to submit designs and they will receive compensation of $1,000, but other competing architects will receive no compensation other than the opportunity to win one of the prizes. Those invited to compete are:

Raymond M. Hood, Voorhees, Gmelin & Walker, Paul Cret, H. Van Buren Magonigle, James Gamble Rogers, Eliel Saarinen, Burnham Brothers, Nimmons, Carr & Wright, Holabird & Root, Bennett, Parsons & Frost, and Benjamin H. Marshall.

The Committee has appointed Earl H. Reed, Jr., 435 North Michigan Avenue, Chicago, as its professional adviser in the conduct of the competition. Those wishing to participate are instructed to file application with Mr. Reed. Drawings are to be sent to him and must be received not later than 12 o'clock noon on November 25, 1929.

•

EXHIBITION AT NEWPORT

Continuing through October an important architectural exhibition is being held in the Cushing Memorial Gallery of the Art Association Building at Newport,

Home of
F. W. Luehring,
Minneapolis

Architect,
Roy Childs Jones—
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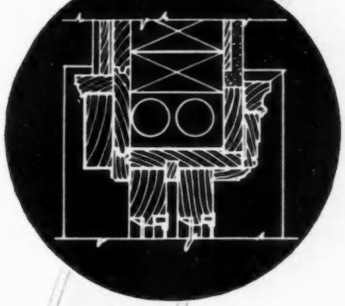

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R. I. The show has been arranged with the idea of bringing the best that American architecture has to offer to the general public, and particularly those who are in position to utilize the knowledge in construction and improvement of their own country homes.

Among the architectural firms who are represented are Grosvenor Atterbury, Stowe Phelps, John Tompkins, associate architects; Dwight James Baum, Cram & Ferguson, Richard H. Dana, Jr., Delano & Aldrich, John DuFais, Thomas H. Ellett, Frank J. Forster, Lawrence H. Fowler, Philip L. Goodwin, Howe & Lescaze, Norman G. Isham, Frederic R. King, H. I. Lindeberg, McKim, Mead & White, Peabody, Wilson & Brown, John Russell Pope, Russell & Clinton and Joseph G. Stevens, 2nd.

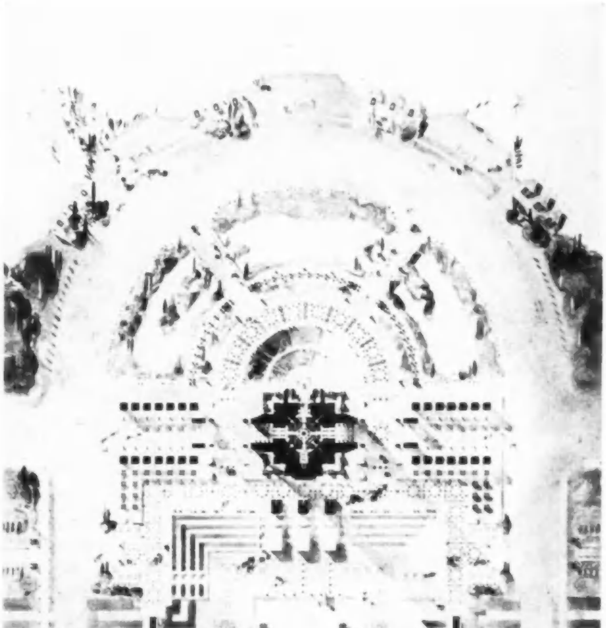


Photo. Dreyer

MEMORIAL TO THE SPIRIT OF THE WEST
J. D. MURPHY, PARIS PRIZE WINNER

DUTCH ARCHITECT AT PRINCETON

A series of lectures by J. J. P. Oud of Holland to be given at Princeton University this next year has been announced by Sherley W. Morgan, director of the School of Architecture. Mr. Oud is coming to this country on the Kahn Foundation which enables Princeton to bring over each year a distinguished scholar to lecture on some phases of the fine arts.

Mr. Oud will give eight public lectures during the first two weeks of May, 1930, on the general subject of modern European architecture. He is preparing them very carefully with the intention of having them published as one of the Princeton series of monographs. Hence he expects to analyze and evaluate the modern movement not only in Holland but throughout Europe.

In addition he will conduct a "seminar" for graduate students in architecture. It has not yet been decided whether this will take the form of a problem in design or the more detailed study of a selected group of buildings, but in any case it will bring him into close personal contact with advanced students.

CHURCH AT CORK, IRELAND

R. Boyd-Barrett of Ireland was associated with Barry Byrne, architect, in designing the Church of Christ King at Cork, Ireland. Mention of this fact was omitted when drawings and photographs of the plaster model were published in the May issue of The Record.

CALENDAR OF EVENTS
GENERAL ANNOUNCEMENTS

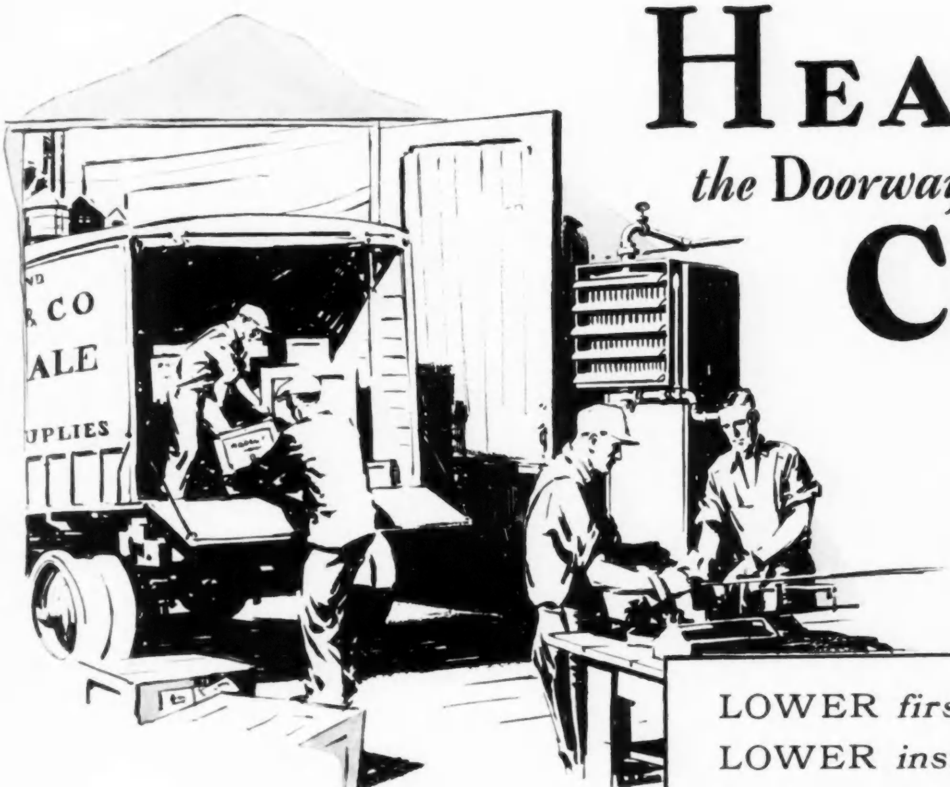
1929	
October	Architectural Exhibit at Art Association galleries, Newport, R. I.
	Le Congrès International d'Architecture, a convention of architects, social economists and industrialists, at Frankfort am Main under the auspices of the *Stadtbauamt*.
Oct. 7-12	The first National Electrical Exposition at the Grand Central Palace, New York City.
Oct. 19-29	Exhibition of Modern Offices at Brussels, Belgium.
Oct. 29-Nov. 27	World Engineering Congress at Tokio, Japan. Excursion and inspection tours, Nov. 7-22.
Nov. 1-15	The 32nd annual Architectural Exhibition of the American Institute of Architects, Philadelphia Chapter, and the T-Square Club in the galleries of John Wanamaker, Phila.
Nov. 9-16	Southern Architectural and Industrial Arts Exposition, Municipal Auditorium, Memphis, Tenn.
1930	
Jan. 18-30	The second International Exhibition of Building Trades and Allied Industries at Brussels.
Jan. 27-31	International Heating and Ventilation Exposition at the Commercial Museum, Philadelphia, under the auspices of the American Society of Heating and Ventilating Engineers.
March-April	Fifth International Exhibition of Housing and Modern Industrial Applied Arts at Nice, France.
May 20-Oct. 1	Exhibition of Modern Industrial and Industrial Arts at Stockholm, Sweden.
May 26-30	Fifth International Congress of Building and Public Works, London.
June 19-30	The fourth Pan-American Congress of Architects and Architectural Exhibition at Rio de Janeiro.
September	International Congress of Architects at Budapest.

COMPETITIONS

Nov. 5	Closing date of the second competition for School Buildings with exteriors constructed of common brick. Prizes of $500 are offered for photographs and floor plans. Programs may be obtained from the Common Brick Manufacturers Association, Guarantee Title Bldg., Cleveland, Ohio.
Nov. 15	The second annual church building competition for Protestant churches, already built and having a seating of 150 to 600 persons, announced by The Christian Herald, 410 Fourth Ave., New York City. Prizes are $1,000, $300, and $200, the awards to be divided equally between architect and church.
Nov. 18	Closing date of the Lehigh Airports Competition.
December	A nation-wide competition will be held for a War Memorial for Chicago. Programs may be obtained by qualified applicants, until Oct. 1 from Earl H. Reed, Jr., Professional Adviser, War Memorial Competition, 435 North Michigan Ave., Chicago, Illinois. Judgment will be announced early in December.

HEAT

the Doorway that's always COLD!



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NEWS OF THE FIELD

W. R. Carnegie, formerly vice president and general manager of Berry Brothers, Inc., Detroit manufacturer of varnishes, enamels and lacquers, has been elected president and general manager and has taken over his new duties. F. L. Colby, the company's president, is now chairman of the board of directors. Berry Brothers' new president joined the organization in 1895. He was treasurer for 25 years before taking up his present duties as general manager.

Plans are under way for the eighth National Exposition of Power and Mechanical Engineering at Grand Central Palace, New York City, opening December 2nd and continuing throughout the week. The exposition covers the entire field of power generation and mechanical engineering and represents a nation-wide gathering of exhibitors, carrying a collection of machinery and products intimately related to the subject. Coincident with the National Power Show, the American Society of Mechanical Engineering will hold their annual meeting.

Combustion Engineering Corporation announces the establishment of a Boston district office at 100 Arlington Street. The following personnel has been appointed for the new office: J. J. Brady, district manager; M. E. Yeager, sales engineer; and S. J. Harris, merchandise salesman.

The American Society of Heating and Ventilating Engineers will hold an exposition during the period of the society's 36th annual meeting in Philadelphia, January 27th to 31st, next. The range of equipment will include that which is used in the individual home as well as in the industrial field.

Affiliation of T. V. Sawyer with the insulating board division of the Chicago Mill & Lumber Corporation was effected August first. He will serve in the capacity of assistant general sales manager and work in conjunction with general sales manager O'Neill Ryan. Mr. Sawyer was formerly connected with the Celotex Company, with which he served for three years as manager of the New York, Philadelphia and Los Angeles zones. Prior to that, he was zone manager for the Chevrolet division of General Motors Corp. The Chicago Mill and Lumber Corporation in November will bring out a new insulating board which will be manufactured at its plant in Greenville, Miss., now nearing completion.

Berrycraft House Paint is the name of the new product manufactured by Berry Brothers, Incorporated, Detroit, Mich. Cards showing assortments of eight, sixteen and thirty-two colors are ready.

The Duriron Company, Inc., Dayton, Ohio, have put on the market an entirely new nickel silicon steel, "Durimet," which they say is resistant to a greater degree and to a much wider range of corrosives than Alcumite, an aluminum bronze alloy which they have been marketing for the last five years. They state also that the new material can be welded or soldered without difficulty and is extremely ductile.

The Southern Pine Association in cooperation with chambers of commerce and civic groups is now engaged in an extensive forest fire prevention campaign. The present movement succeeds a forest protection program instituted more than one year ago with officers and directors of the organization sponsoring the display of electric scene-in-action fire prevention pictures in most of the mill towns and lumber producing centers of the Southern Pine belt.

Because of the fact that the lumber manufacturing industry is one of the South's basic enterprises, the economic loss resulting from devastation by fire of standing timber and new growth is directly reflected in the general state of prosperity. When it is realized that practically all forest fires develop from some phase of human carelessness, the annual loss now recorded is considered appalling by forestry experts. It is to stem this tide, according to the Southern Pine Association, that the present program is now being actively conducted with a great emphasis placed upon the part which the public can take in reducing such losses and devastation of the standing forests and reforested areas.

Richmond Radiator Company of New York has just announced the new "Richmond Floorline Radiator" which is made of steel or copper fins welded on pipe, and is made in units 8" high, 3½" thick and either 36" or 18" long. These units may be installed separately or jointly to give the required heat and they may be made inconspicuous when painted to match the trim of the woodwork.

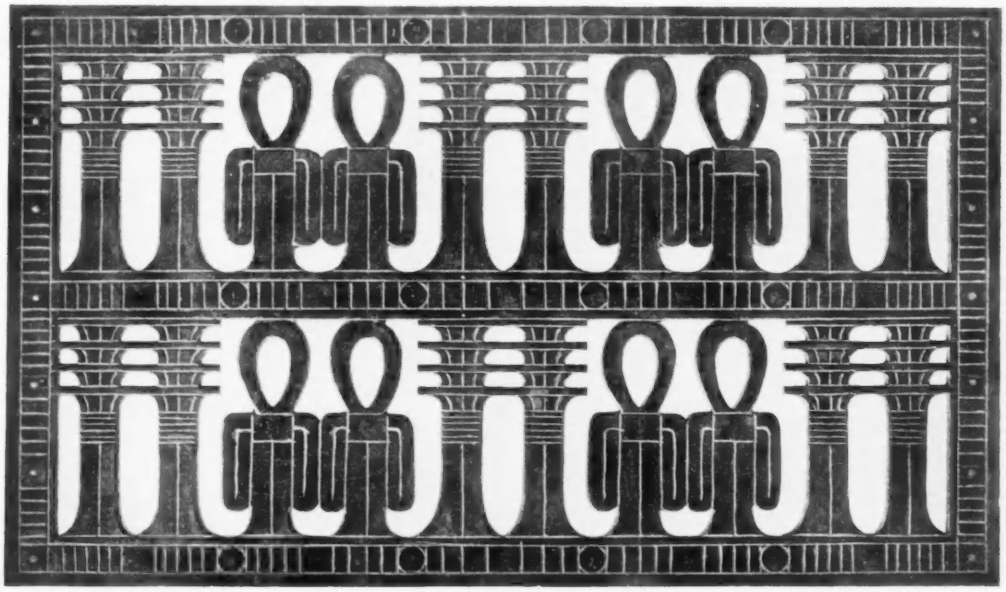
Darius E. Peck, assistant manager of the law department of the General Electric Company since 1920, was elected vice-president and general counsel of the company at a meeting of the board of directors in New York on August first. At the same time President Gerard Swope announced the retirement of Allen H. Jackson, who has been vice-president and general counsel since 1922 and associated in the company's law department since 1902.

According to the "Monthly Summary of Foreign Commerce" published by the United States Department of Commerce, 13,119,000 board feet of American Walnut in the form of finished lumber were exported from the United States in 1928—an indication according to the American Walnut Manufacturers' Association, that this wood is preferred abroad to English or Circassian Walnut in the manufacturing of fine furniture and for other uses where an easy working, durable wood of natural beauty is required.

The Dallas Builders' and Manufacturers' Exhibits, sponsored by W. W. MacGruder of Hansen-MacGruder, Inc., temporarily located at 5020 Bryan Street, is the name of a newly created organization in Dallas, founded for the purpose of establishing a permanent exhibit of building materials, equipment and manufacturers' products, for all classes of buildings. This exhibit will be housed in a building designed and erected especially for the exhibits by Mr. H. B. Thompson, Dallas architect, who is now drawing the plans.

HIGHTON-HART *and* COOLEY

GRILLES



THROUGH special equipment and master workmen we are permitted to allow perfect architectural freedom of individual design and unusual finish.

For the last half-century pride of craft has inspired our workmen to individual research and experiment, which have placed us in perfect control of both mixture and color.

The above grille is unusual both as to its design and antique bronze finish and is an example of the special order work which we are prepared to execute.

Our standard designs are of equally high quality and workmanship and offer a practically unlimited choice as to design and purpose.

The combination of long experience and high quality results in a line of exceptionally high grade grilles that reflect credit not only upon ourselves, but also upon the architect who incorporates them in his buildings.

Refer to Sweet's Architectural Catalogues for full information, or write for our new catalogue recently off the press.

WM. HIGHTON & SONS

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BOSTON - 75 Portland St.
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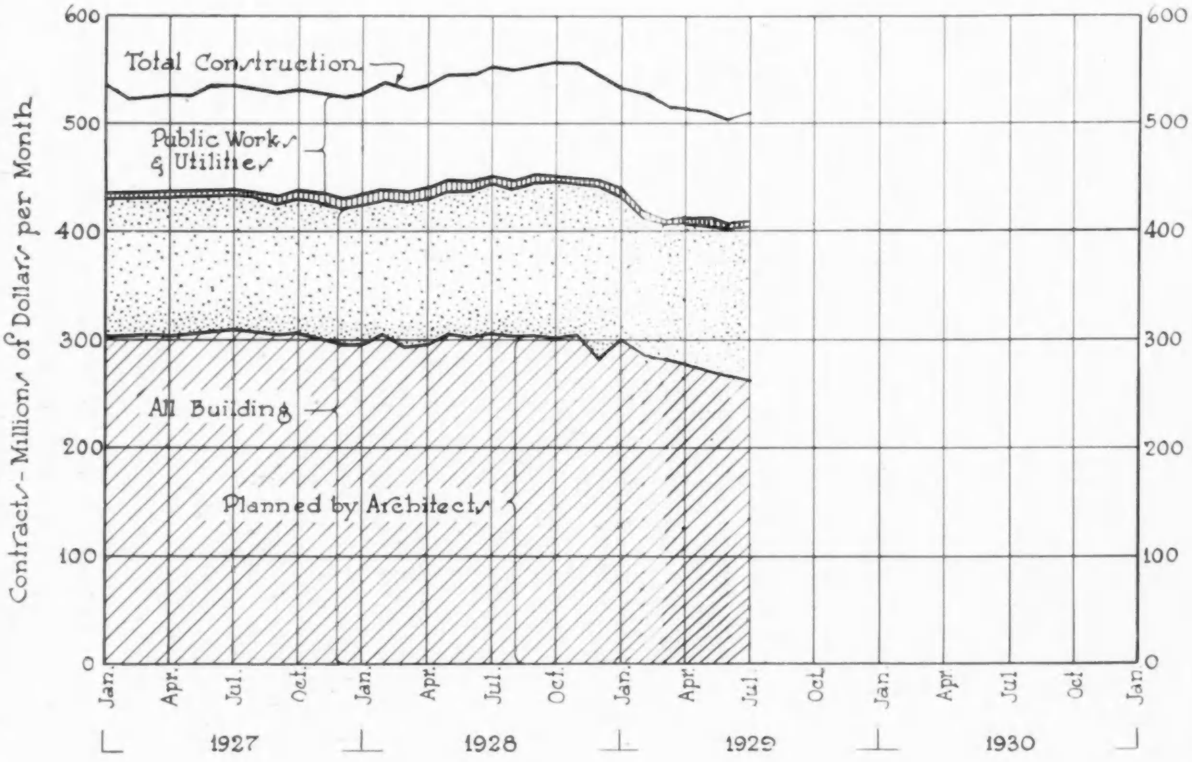
PHILADELPHIA - 1600 Arch St.
CHICAGO - 61 West Kinzie St.

CONSTRUCTION STATISTICS

From the records of F. W. Dodge Corporation, Statistical Division. The figures cover the 37 states east of the Rocky Mountains and represent about 91 per cent of the country's construction volume.

First Seven Months, 1929

Classification	TOTAL CONTRACTS Number of Projects	TOTAL CONTRACTS Valuation	WORK PLANNED BY ARCHITECTS Number of Projects	WORK PLANNED BY ARCHITECTS Valuation	Per cent of Total
Commercial Buildings	14,543	$580,918,300	6,269	$444,156,500	76
Industrial Buildings	3,946	460,677,000	1,417	115,633,700	25
Educational Buildings	2,797	237,296,500	2,317	227,025,900	96
Hospitals and Institutions	666	74,206,500	493	64,387,700	87
Public Buildings	795	70,048,500	452	64,724,100	92
Religious and Memorial	1,390	67,389,000	1,004	60,539,600	90
Social and Recreational	1,560	87,925,500	939	69,761,200	79
Residential Buildings	72,164	1,302,995,500	18,804	803,723,900	62
Total Building	97,861	$2,881,456,800	31,695	$1,849,952,600	64
Public Works and Utilities	11,136	802,526,100	197	24,444,900	3
Total Construction	108,997	$3,683,982,900	31,892	$1,874,397,500	51
Total construction, first seven months, 1928	122,451	$4,028,299,900	37,301	$2,238,397,500	56




Eliminate the Danger of Basement Seepage
Install a
PENBERTHY PRODUCTS
DETROIT
CANADIAN PLANT WINDSOR ONT.

RECENT TRADE PUBLICATIONS

ISSUED BY MANUFACTURERS OF CONSTRUCTION MATERIALS AND EQUIPMENT

[These may be secured by architects on request direct from the firms that issue them, free of charge unless otherwise noted]

SAFETY SWITCHES, CONTROL BOARDS, POWER OUTLETS

"Safety Switches." Switch types; description, capacities, uses. 8⅜ x 10½ in. 7 pp. Ill.

"Controlite." The theatre control board. Combined switchboard and dimmer bank. Simplicity of control. Advance set-up of lights. Unit construction. Actual installation. 8⅝ x 10½ in. 11 pp.

"Flex-A-Power." The convenience outlet for power in industry. Features of construction. Advantages. Installations. Flex-A-Power, Junior, a branch power system for smaller ampere capacity. Typical specifications for Flex-A-Power installation. 8½ x 11 in. 15 pp. Ill. The Trumbull Electric Mfg. Co., Plainville, Conn.

STONE, PLASTIC

"Wiggin's Text Book of Artistic Wall Textures." Rufkote for interiors. Colorful, enduring backgrounds. Surface preparation. Mixing and application of Rufkote. Producing the texture patterns. Examples of texture patterns. Glaze-staining, highlighting, bronzing, starching, sizing and smut coats. Polychrome finishes. Decorative effects in Rufkote. H. B. Wiggin's Sons Co., Bloomfield, N. J. 5 x 8 in. 95 pp. Ill.

TERRA COTTA

"Atlantic Terra Cotta." Wide divergence and wide adaptability of Atlantic Terra Cotta. Use in Smith-Young Tower, San Antonio, Texas, a beautiful example of Gothic design. Adaptability to the modern design of the Southwestern Bell Telephone Building, Dallas, Texas. Sixteen plates. Atlantic Terra Cotta Company, 19 West 44th Street, New York City. 8⅜ x 10⅞ in. 19 pp.

CONCRETE

"Monolithic Concrete Buildings." Characteristics of the monolithic or ferro-concrete type; new styles. Accomplishments in stucco. Designs illustrating adaptability of concrete to almost any type of architectural treatment. Recommended methods for construction. Portland Cement Association, Chicago, Ill. 8 x 10¾ in. 47 pp. Ill.

HAIRPIN CLIP MACHINE

Leaflet describing new Steelcrete Hairpin Clip Machine. Photographs illustrate simplicity of operation. The Consolidated Expanded Metal Cos., Wheeling, W. Va. 4 x 9½ in.

COVERING SYSTEM

"Ric-wiL Underground Conduit." Description. Conduit fittings and shutters. Easy installation. Lined conduit. Unlined conduit. The Ric-wil Company, Cleveland, Ohio. 8½ x 11 in. 7 pp. Ill.

NAILER JOISTS

"Truscon Nailer Joists for Light Occupancy Buildings." A. I. A. File Number 13g. Details. Designing data. Safe loading tables. Specifications. Truscon Steel Company, Youngstown, Ohio. 8½ x 11 in. 15 pp. Ill.

(Continued on page 180)

The Invisible Superintendent *at the* Mortar Box *Protects Winter Masonry*

BRIXMENT mortar, like any other mortar containing water, is not freeze-proof. Nevertheless it is used regularly for mid-winter masonry even in the severest northern climates. In fact during the winter months more BRIXMENT is sold in proportion to the volume of building construction than at any other time.

BRIXMENT mortar sets up faster than portland-cement-and-lime mortar in which a large quantity of lime is used and this set can be made to take place at any temperature before freezing occurs by heating the sand and water. Once BRIXMENT mortar has set, it remains sound and unimpaired no matter how long and severe the freezing period may be.

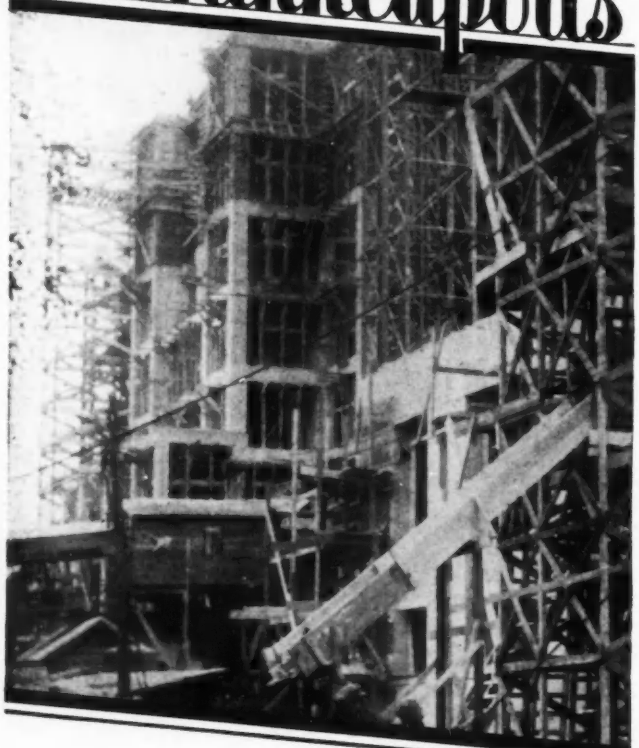
The oily content of BRIXMENT which reduces the freezing point of the mortar gives further protection in freezing weather. Send for architect's handbook. Louisville Cement Company, *Incorporated,* Louisville, Ky.

District Sales Offices: 1610 Builders Bldg., Chicago; 301 Rose Bldg., Cleveland; 602 Murphy Bldg., Detroit; 101 Park Ave., New York

BRIXMENT

for Mortar and Stucco

When a concrete mixer is used, the mortar can be heated by means of a torch attached to the mixer so that the flame is thrown inside the drum. If the weather is not too severe, this method alone will suffice.



STORE FRONTS

"The Business of Buying a Store Front." Designs and materials in different types of store fronts. Adaptability for great variety of business by slight changes or alterations in design. Four treatments using same general floor plan showing possibility of varying façade. Colored plates, studies from actual installations. Zouri Drawn Metals Company, Chicago Heights, Ill. 8½ x 11 in. 32 pp. Ill.

ROOF SLABS

"A New Chapter in the History of Concrete." Story of Featherweight Concrete Insulating roof slabs. Detail drawings. Specifications and essential data; weights, dimensions, etc. Detail drawings of Featherweight Nailing Concrete roof slabs with essential data. Federal Cement Tile Company, Chicago, Ill. 8⅝ x 11⅛ in. 36 pp. Ill.

TILE

"Architectural Monographs on Tiles and Tilework." No. 6-Ceramic Decoration in India. The role of ceramics in the Mogul architecture of India. Indian architectural types. Early architectural ceramics. Plates showing the tiled ornaments from kiosks on the third floor of Akbar's Tomb at Sikandra. Saracenic ceramics in India. Associated Tile Manufacturers, 420 Lexington Avenue, New York City. 7¾ x 11 in. 32 pp. Ill.

VITROLITE

"Table, Counter & Furniture Tops of Vitrolite." Use in the restaurant. Colors. Designs. Installations. Facts about Vitrolite. In the hotel; for furniture. Other uses. 8½ x 11 in. Ill.

"Decorated Vitrolite Soda Fountains." Various soda fountain designs with Vitrolite. 8½ x 11 in. 6 pp. Ill.

"Vitrolite for the Home." Bathrooms. Kitchens. Recent installations. 8½ x 11 in. 6 pp. Ill.

"Vitrolite Sanitary Construction." Use of Vitrolite for sanitary and industrial purposes. New type of toilet compartment construction. 8½ x 11 in. 15 pp. Ill. The Vitrolite Company, 120 So. La Salle Street, Chicago, Ill.

DRAFT FANS

"Sirocco Forced Draft Fans for Domestic Heating Plants." Characteristics. Determination of air requirements. Selection of fan. Capacity tables. Dimension diagrams. Typical installations. American Blower Corporation, Detroit, Mich. 8½ x 11 in. 12 pp. Ill.

RADIO EQUIPMENT

"RCA Centralized Radio Equipment." For hospitals, hotels and schools, etc. Radio panels. Loud speaker for flush wall mounting; volume control. Radio outlet jack unit. Portable controls, etc. Radio Corporation of America, Woolworth Building, New York City. 9 x 11½ in. 17 pp. Ill.

FIRE DOORS

"Doors for Warehouses, Piers, Garages and Commercial Buildings." "Horifold" doors. Horizontal folding-up doors; typical installations. Adaptability. Salient features. Construction. Space requirements. Corrugated "Ver-Tel" telescoping doors. Advantages. Specifications. Security Fire Door Co., St. Louis, Mo. 8½ x 11 in. 12 pp. Ill.

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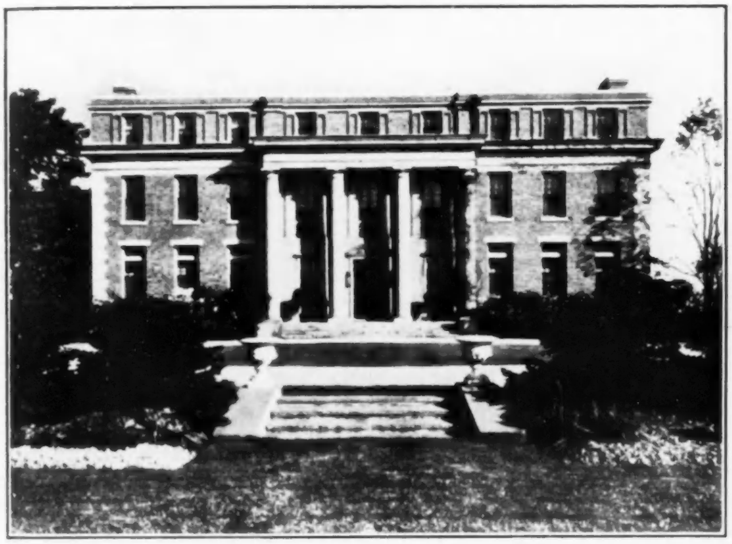
Telephone Convenience for Larger Residences



In the residence of Col. F. M. Alger at Pride's Crossing, Massachusetts, seventeen telephone outlets, including two in the garage, are provided for complete telephone convenience. The telephone wiring is carried in conduits built into the walls. Walker, Walker & Kingsbury, Architects, Boston, Massachusetts.

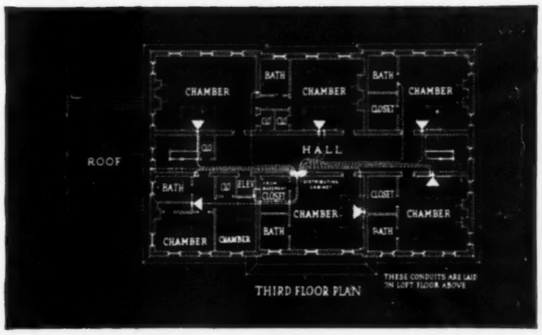
In planning the telephone arrangements for larger residences, it is especially desirable that architects consult freely with the telephone company.

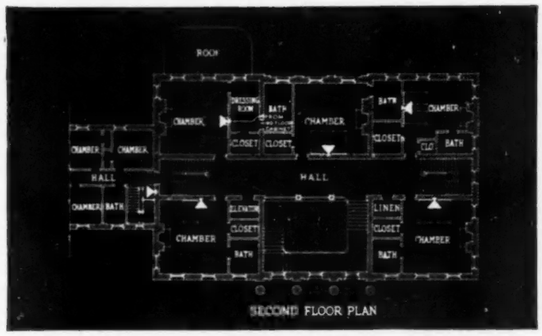
Most important, of course, is the placing of the outlets so that the telephones, when installed, will bring greatest convenience and comfort in the use of the service . . . and providing conduit to conceal and protect the telephone wiring.

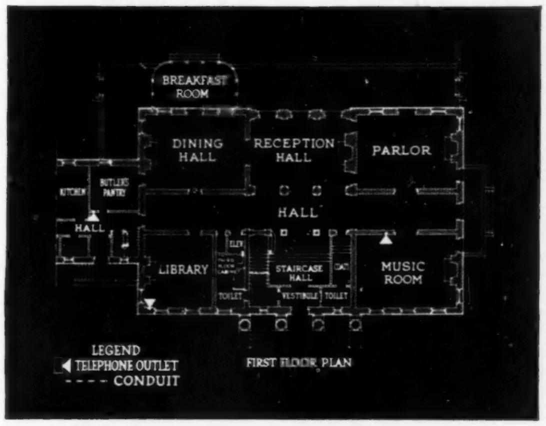
Bell Company representatives will gladly aid in working out the telephone convenience which may be needed, both now and in the future. They will suggest such service features as seem appropriate to particular houses . . . a second telephone line . . . push buttons and switches for intercommunication among the house telephones . . . additional bells so incoming calls can be easily heard and promptly answered . . . portable telephones for plugging into jacks at appropriate places . . . and many other modern telephone conveniences.

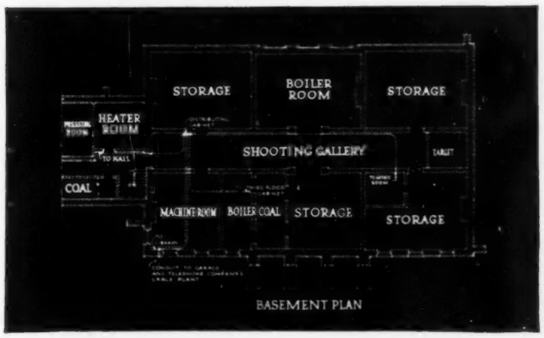
Your local Bell Company is constantly studying ways to improve its service. It has much information of interest to you as an architect. Without charge, it will help you in planning the facilities for telephone service for all of your houses, small as well as large. Just telephone the Business Office.

AMERICAN TELEPHONE & TELEGRAPH CO AND ASSOCIATED COMPANIES · BELL SYSTEM









RECENT TRADE PUBLICATIONS—(Continued)

WATER CLOSETS

"Complete Architectural Data on the T N One-Piece Water Closet." Modern sanitary improvements. Advantages. Roughing measurements. Actual installations. W. A. Case & Son Mfg. Co., 220 Delaware Avenue, Buffalo, N. Y. 8⅝ x 11 in. 11 pp.

FANS

"Silex Conoidal Fans." Quiet ventilating fans. Double curved blade silex rotors. Balance. Shafts, Bearing details. Operating characteristics. Specifications. Standard arrangements. Capacity and static pressure tables. Buffalo Forge Company, Buffalo, N. Y. 8½ x 11 in. 31 pp. Ill.

SURFACE TREATMENTS

"Data and Specifications on Concrete and Terrazo Surface Treatment." 3-b-2-3-4. "Lapidolith" for hardening concrete. Sonneborn's cement filler and dustproofer; a surface coating for cement floors. "Cemcoat" floor enamel for concrete floors. "Fermo," an integral liquid for waterproofing, controlling and densifying concrete and cement mortars.

"Data and Specifications on Waterproofing and Dampproofing." 7-a-1-2-3, 7-b-2-21-22. For foundation walls, exterior surfaces. Mass concrete, floor systems, etc. Treatment of inner surfaces of exposed walls.

"Data and Specifications on Painting." Interior and exterior. Various products for meeting various conditions. L. Sonneborn Sons, Inc., 114 Fifth Avenue, New York City. 10¼ x 12 in. A folder containing data and specifications on five subjects.

LIMESTONE

"Indian Limestone Sculpture Groups on the Michigan Avenue Bridge, Chicago, Illinois." Four illustrations of the merit of the finer-grained more even textured varieties of Indiana Limestone for sculpture. 8 x 11¼ in.

"Administration Buildings of Gray Indiana Limestone." Appropriate use of this material for modern commercial structures. Examples of its use. 8⅝ x 11 in. 14 pp. Ill. Indiana Limestone Company, Bedford, Ind.

LIGHTING

"Union Metal Exterior Lighting Fixtures." General information. Entrance standards. Specifications. Bronze work. Various designs. The Union Metal Manufacturing Company, Canton, Ohio. 8½ x 11 in. 8 pp. Ill.

CALCIUM CHLORIDE

"Solvay Calcium Chloride in Concrete Construction." Effects of calcium chloride on concrete. Its advantages. Effects of calcium chloride on reinforcing. Temperature and the strength of concrete. Various types of concrete construction. Directions for using Solvay Calcium Chloride. Specifications. 7⅜ x 10¼ in. 29 pp. Ill.

"Solvay Calcium Chloride." For dustlaying purposes. Solvay Trailer Spreader. Solvay One-Man Spreader. Various uses. Where to buy. 5½ x 8 in. 22 pp. Ill.

"Fire." Solvay Calcium Chloride solution in fighting fire. Advantages. 3 x 6½ in. 16 pp. Solvay Sales Corporation, 40 Rector Street, New York City.