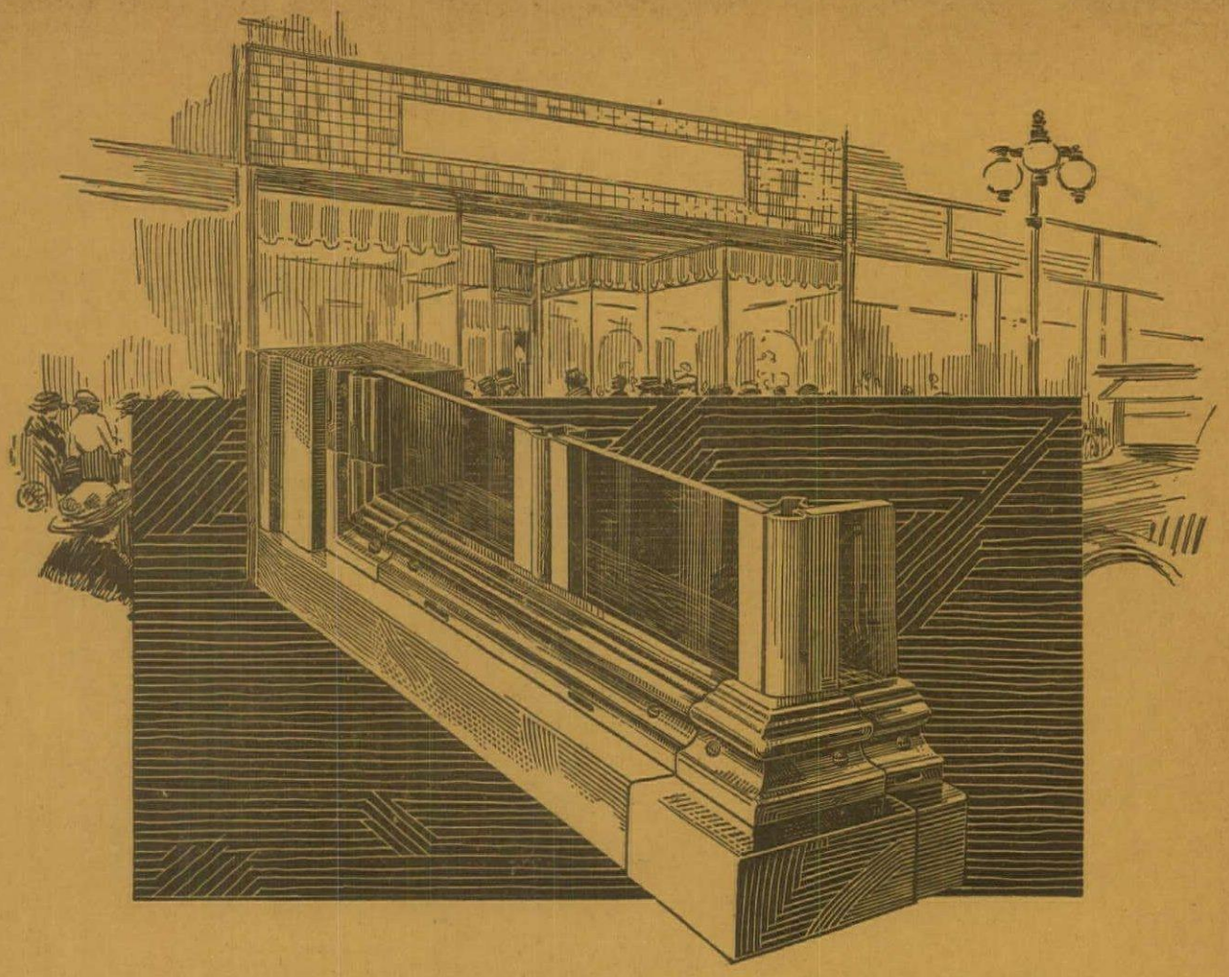
THE AMERICAN ARCHITECT AND THE ARCHITECTURAL REVIEW

EFFECT OF NEW YORK'S ZONING LAWS ON COMMERCIAL BUILDINGS ❦ THE ONE ROOM APARTMENT ❦ BANK INTERIORS ❦ COST ACCOUNTING FOR ARCHITECTS ❦ ACOUSTICS IN AUDITORIUM DESIGN

VOLUME CXXV JUNE 18, 1924 NUMBER 2448



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CONTENTS

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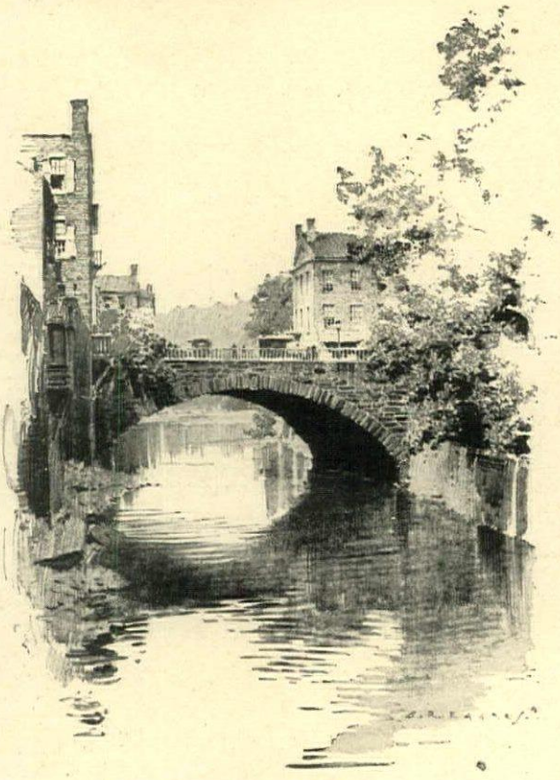

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The ARCHITECTURAL REVIEW

VOL. CXXV WEDNESDAY, JUNE 18, 1924 NUMBER 2448

EFFECT *of the* NEW YORK ZONING RESOLUTION *on* COMMERCIAL BUILDINGS

VIEWING the skyline of New York, as it is developing under the wise restrictions of a well framed zoning act, it becomes noticeable that there is an increasing appreciation, on the part of clients, of good architecture as a commercial asset. While the same limitations are become so elastic that it has become possible to introduce features of design that owners at one time believed were unnecessary additions to the cubage cost and therefore lowered the income bearing possibilities of a building. Good architecture is inculcating a certain pride of occupancy and a higher class of tenantry, that results in a completely occupied building and a consequent satisfactory investment.

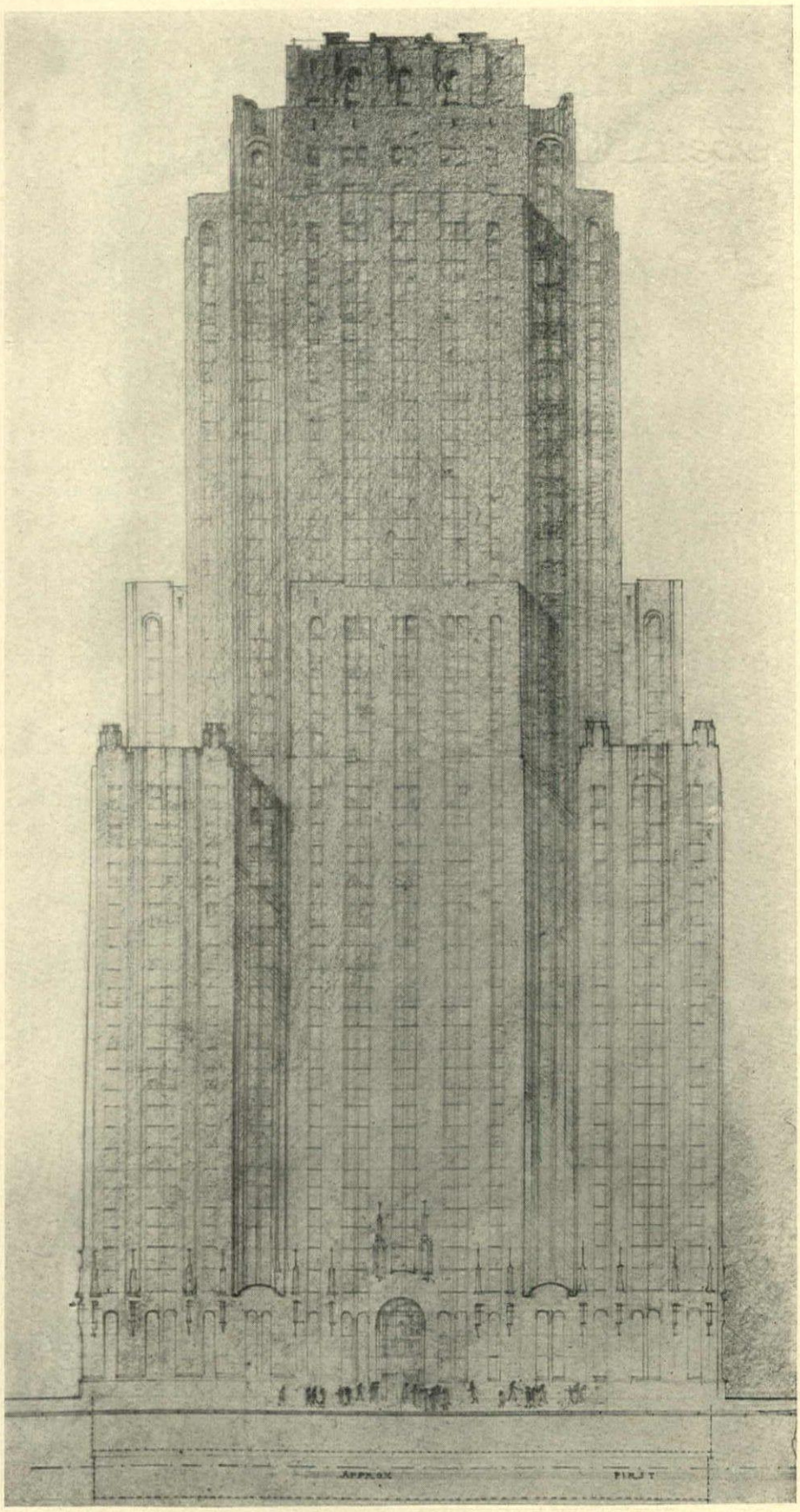
Once in a long while a building is constructed on which a considerable sum of money is spent to secure beauty and dignity. Good examples are the Woolworth Building, the Metropolitan Buildings in New York, and apparently the Chicago Tribune Tower, and in this unusual group there may also be included many civic, state and federal buildings. But after all, however much a new large hotel or office building is advertised as being built regardless of cost, it is generally the cost or rather economies of cost that mostly affect the design.

CHICKERING HALL, WEST 57TH STREET, NEW YORK
CROSS & CROSS, ARCHITECTS

A step lower than these most costly buildings, comes the creditable type of commercial office building, hotel or apartment house, and these buildings are the ones that are apt to be of such large dimensions and covering so much ground space that they are the ones more directly affected by zoning regulations.

Although such commercial buildings on large lots are the ones most affected by zoning laws, we are beginning to learn that it is to these buildings that the zoning restrictions will be of benefit as relating to design.

It may be trite to state that zoning consists in principle, in constructing on the building line to a certain prescribed height, and from that point working inside of a certain angle or envelope, starting from the center of the street, and varying slightly according to location.

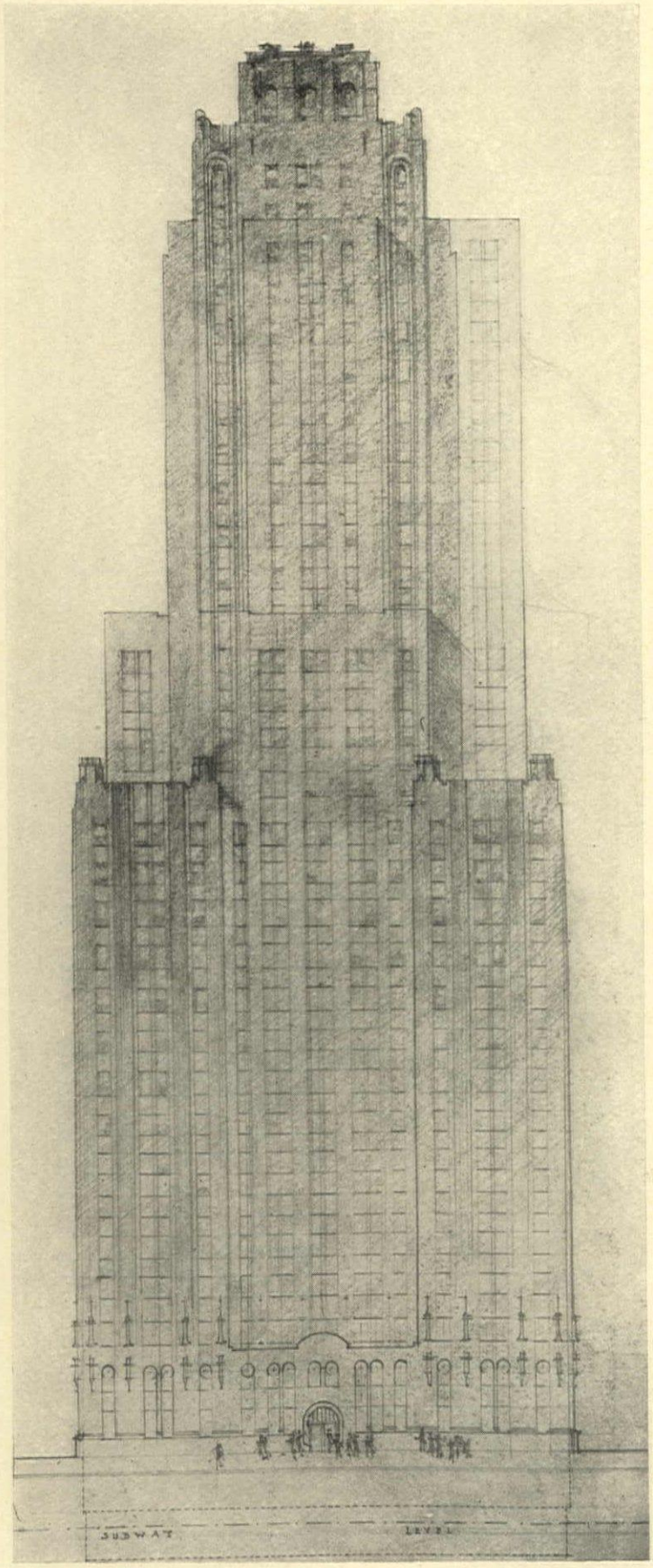


AVENUE ELEVATION

PRELIMINARY DESIGN FOR COMMERCIAL OFFICE BUILDING ON AVENUE BLOCK FRONT

JOHN MEAD HOWELLS, ARCHITECT

(From the drawing by Mr. Howells)



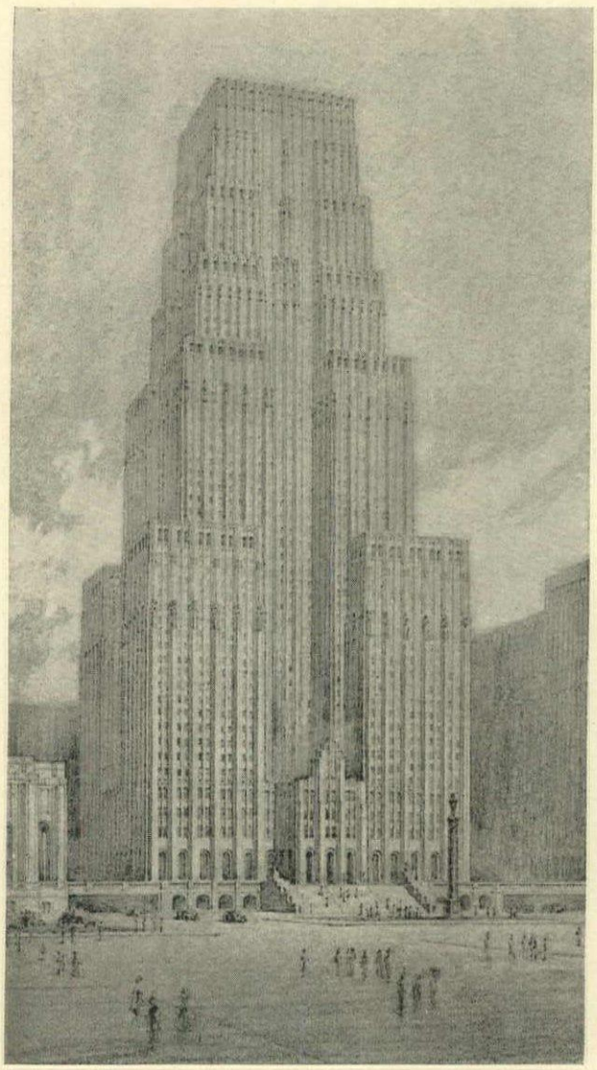
STREET ELEVATION

PRELIMINARY DESIGN FOR COMMERCIAL OFFICE BUILDING ON AVENUE BLOCK FRONT

JOHN MEAD HOWELLS, ARCHITECT

(From the drawing by Mr. Howells)

Taking a lot with an avenue frontage of a 200 foot block, and, say, 150 or 200 feet on the side streets, and designing according to the letter of the law, there would result a commonplace suggestion of one box placed on top of another. These boxes may be cubes or higher or lower boxes, but if nothing further is done to them, they will remain, in suggestion, as simply one box on another and they cannot in the mass suggest a unified design.



PROJECT FOR GRANT HOTEL, CHICAGO, ILL.

ELIEL SAARINEN, ARCHITECT

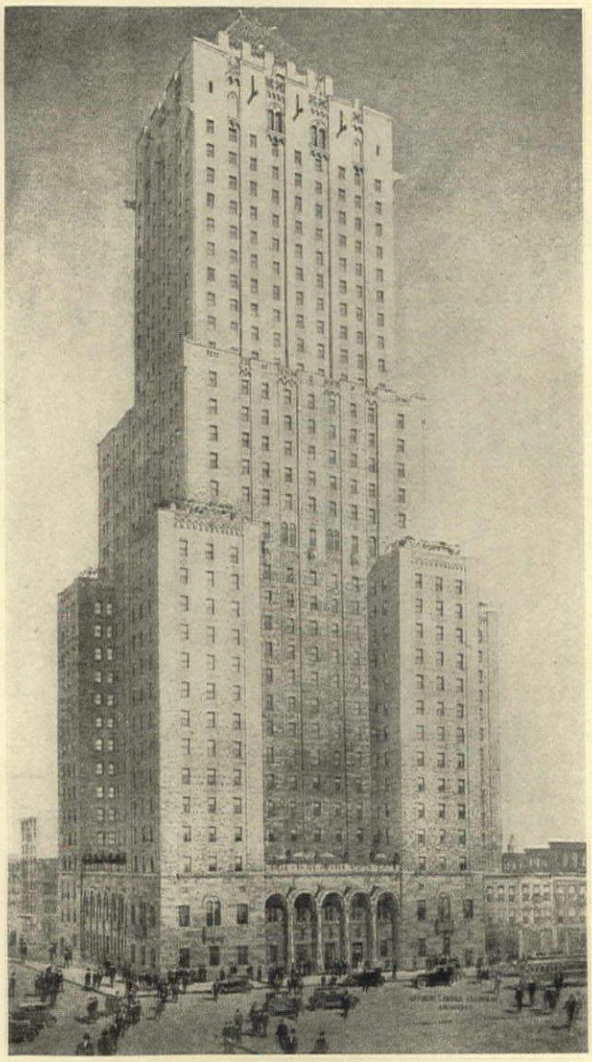
The problem, therefore, seems to be to avoid the "box-on-box" appearance by striving for one or more vertical surfaces which may persist as nearly as possible from top to bottom, at some point or points, and thus unify the design by cutting into the "box-on-box" sequence. One such surface with the shadow it will create from top to bottom is sufficient to tie the composition together. The unpleasant "box-on-box" design becomes at once a clifflike structure seeming to grow up from and out of the ground.

Realizing perfectly that this result cannot always be effected, the fact that architects are striving for it is shown by the design by Mr. Howells illustrated herewith. This design is for a pro-

AMERICAN RADIATOR BUILDING, WEST 40TH STREET, NEW YORK

RAYMOND M. HOOD, ARCHITECT

posed commercial office building to be located on an avenue block front, in which the unification of the design has been more or less successfully accomplished by two deep sinkages on the avenue front, and one on the street side. The same thing has been accomplished by Mr. Harmon in the



THE SHELTON, NEW YORK

ARTHUR LOOMIS HARMON, ARCHITECT

Shelton Hotel, although in this case the surface which starts near the ground level cannot, of course, reach the top.

Perhaps the most striking example of what we mean is the design for the Grant Hotel shown by Mr. Saarinen, in his project for a new Chicago development which we here reproduce. This design is an object lesson of what we have in mind, for it clearly shows that a "box-on-box" treatment, such as is probably the result of any zoning, can be cut by one sheer surface forming a sinkage or courtyard, starting at the top with no depth and becoming deeper as it gets lower. A good example of a unifying vertical line is the deep vertical cut in the side of the Bush Terminal Building, now unfortunately hidden by an adjoining construction. Raymond M. Hood's American Radiator Building is a fine example of the zoned building, though on too narrow a lot to accent the argument with which this article is concerned. The same might be said of Chickering Hall on West Fifty-seventh Street, though this is cleverly designed as an advertisement and does not follow the zoning law. This last building does, however, call to mind the inestimable boon conferred by the zoning law in bringing about the disappearance of unsightly pent house and roof tanks which for years have awkwardly crowned our classic skyscrapers. These excrescences have now been absorbed in the natural zoned type as is proven by the fact that every one of the examples cited in this article, has eliminated and absorbed into the design the pent house, the elevator machinery space and the roof tank.

Again referring to the purely commercial aspect of zoning, it is a fact that this new resolution has resulted in imparting a natural clifflike shape and sky outline to buildings on very large lots, and has obviated the necessity of trying to give the design an artistic shape by introducing cornices and surface architectural treatment. All horizontal cornices may now, and with advantage, be eliminated. The building which Mr. Howells shows in his design is plain brick from top to bottom. This type of building can secure great economies by eliminating all decorative and even costly material from exteriors, and depending entirely for beauty and impressiveness on the study of shape and the resultant shadows and silhouette against the sky. This method of design should have a tendency to reduce costs and if the set-backs are made to correspond with the column centers, the result should be an economically constructed building. Of course, if the set-backs do not correspond with the column centers, complications of extra steelwork, girder height, and the increase of story heights at the set-backs are apt to counteract the natural economies resulting from zoning.

NEW YORK CHAPTER, A. I. A.

THE New York Chapter, A. I. A., closed one of the most successful seasons of its history with a meeting on June 10, at the Century Club. After luncheon, the work accomplished by the New York Building Congress was explained by Stephen F. Voorhees and Burt L. Fenner. Both of these gentlemen have devoted a great deal of time to the work of this organization in an official capacity and by their reports it was made evident that the Building Congress renders a valuable service to the building industry. This is strikingly apparent in the better relations that have been established between employers and labor. The progress made in apprenticeship in many trades is notable and it appears that it would be much greater if contractors would employ their full quota of apprentices. A plea was made for architects to exert their influence on contractors to this end. The place of the architect in this Building Congress movement was made clear. Its success is assured and architects should actively participate in its work.

D. Knickerbacker Boyd, Philadelphia, recounted some experiences of a recent cross-country trip to the Pacific Coast. He found that ninety-five per cent of the mechanics on buildings were unable to read the plans and had no knowledge of the general details of the building on which they were working. He clearly showed the disadvantages of this condition of affairs and its influence on architectural practice. Mr. Boyd suggested that much would be gained by the workman and the architect if the draftsman gave a certain amount of time to observing the actual construction of the work for which he made the plans. In doing this the draftsman should make a personal contact with the mechanic. The draftsman's value to the architect would be greatly enhanced. Donn Barber gave an interesting and comprehensive report of the annual convention at Washington. He commented favorably on the improved method of planning and conducting the conventions and appraised this convention as the best and most beneficial to the Institute, that he ever attended.

The remarks of the speakers were given careful attention and appreciation was evidenced by applause and after-meeting discussion. This meeting closed a year of much work done under Mr. Waid's administration. This was made possible by the careful planning of the Chapter's undertakings, their appeal to the membership and the hearty co-operation inspired by its president. The incoming administration of B. W. Morris will have much work to do in connection with the great architectural exhibit and the convention of The American Institute of Architects which will be held concurrently in New York next year. The high standard of efficiency attained by Mr. Waid's administration will undoubtedly be maintained.

THE UTILITY OF THE MILLIONAIRE

THERE has been much comment and notice of the immense wealth accumulated by Mr. Ford, which is said to amount to £60,000 a day, and may grow to double that sum in the course of the next ten years, states *The Architect,* London, in a recent issue. Doubtless such colossal figures make one's mouth water, and eager reformers in every country feel that it would be excellent if they could obtain control of such enormous sums by taxation or other means.

But Mr. Ford's fortune has been amassed in two ways: first, by his business ability, and secondly, because instead of spending a large part of his income the money goes to increase the capital employed in business, with the result that he can manufacture motors more cheaply and sell them at less profit than his competitors, the effect being to bring motors within the means of comparatively poor people, while at the same time affording an enormous amount of employment to workers. Both of these results are in the direction of public services to the community. As it is quite clear that no man other than an imperial maniac like Nero could spend more than a fraction of such an income as Mr. Ford makes, and that if he spent it as Nero might have done he would no longer be the astute, hard-working business organizer he is, it is difficult for us to see why the accumulation of such fortunes should be objected to except by a comparatively small number of motor car makers who are naturally annoyed to see Mr. Ford content with profits which on their smaller output would be quite insufficient. If any State could manage business as successfully as Mr. Ford does, we should have good reason to become Socialists, but State enterprise is not remarkable for its success, and has hitherto led to increased, and not decreased, demands on the public purse. The Socialist party are in the position of children who pull a watch to pieces but, confronted with the difficulty of putting it together again, would pass on to another act of destruction.

MILLIONS FOR NEW ZEALAND HOMES

THE Prime Minister of New Zealand, it is reported, has recently stated that a loan fund approximating £1,000,000 is likely to be raised to furnish aid to persons desiring to build homes, such a fund to supersede an older one which limits the loans from 70 to 75 per cent of construction costs. The new fund, if approved by the New Zealand Government, will allow an advance up to 95 per cent. The Government has already built or assisted in the building of 12,861 homes at an expenditure or advance of £18 316,330.

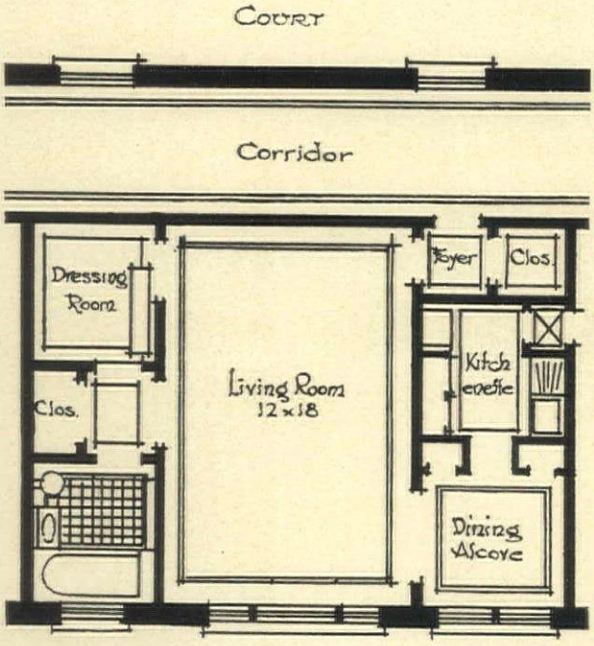
The ONE ROOM APARTMENT ARRIVES

BY MORGAN G. FARRELL

THE sharp change of direction imparted to the policy of apartment builders by the double costs of the last three years, is responsible for at least one radical modification in design—the reduction of the number of rooms to a minimum.

In the short space of a generation the tenant building developed grandly from the railroad flat of the nineties to the elaborate organism of the last decade. From six rooms and a so-called bath to fourteen rooms and four or five baths, the accretion proceeded unchecked until the revival of post-war building brought it up with a round turn.

With building and operating costs increased one hundred per cent and tenants' incomes about where they were before, the capacity of absorption of the market emphatically dictated a reduction in the number of rooms to the suite. The maximum is now about eight rooms with a few expensive exceptions. Five and six room suites are more common in the new elevator buildings and in the "walk-ups" of the outlying districts.



THE FLOOR PLAN

The latest apartments on the more desirable avenues of the cities are planned for five, four, three and even two rooms, to reach the lower income-strata. As the number of rooms diminishes, the appointments increase, so that the private facilities sacrificed may be replaced by others provided by the owners. Thus the entire economic aspect of apartment dwelling has altered.

The shrinkage in the rooms has come about in this wise: A six room suite, once considered the smallest, compatible with comfort, included a living room, dining room, two chambers, a kitchen and a maid's room with one or two baths. The maid's room disappeared first, as an anachronism —the maids having already disappeared. With their obsolescence, the dining room became more or less of a luxury, since a growing number of tenants preferred to dine out, confining their home meal service to breakfast and luncheon. So the dining room went and the kitchen, somewhat contracted, remained.

Among the smaller families, newly married couples, or those whose children were away at school, or in establishments of their own, there was little use for two chambers. Guests no longer came and remained over night. The car and the transit facilities enabled them to reach their own homes at any hour.

If the boy or girl came home for the holidays the living room afforded the necessary, temporary sleeping space. In summer the apartment was closed for the season, anyway.

Entertainment had become largely a public function, so that the living requirements of small families were adequately met by the three room suite including a living room, chamber, kitchen with pullman and bath.

The ingenuity of the architect and owner has consequently been directed toward the reduction of space, the increase of efficiency and the provision of facilities once considered an essential part of housekeeping.

By a logical extension of the same reasoning and the application of the principles of efficiency, the one room suite has finally been evolved. It has already made a successful debut in the smaller cities and is gradually extending to the large ones.

The accompanying sketch-plan and photographs illustrate one design of this type, which has met with much favor. The company which owns the apartment shown has built a number of similar buildings in various cities and operates them on

the chain-hotel plan. Readers who have visited Canada will recognize features which have been in vogue there for several years, but which, for some reasons, have only recently found their way into the United States.

A suite, as the sketch shows, consists of a large living room about twelve by eighteen feet. It is

EXTERIOR OF A ONE ROOM APARTMENT HOUSE, SHOWING ROOF GARDEN

THE JAMES, SYRACUSE, N. Y.

R. A. McHALE, ARCHITECT

entered through a small foyer, acting as a vestibule to insure privacy. This room is convertible into a chamber at night by opening the doors of the dressing room, upon which are mounted single or double folding beds. When the doors are opened out flat against the wall and the beds lowered into place by a simple mechanism, the chamber is prepared for the night. The dressing room is amply large enough to serve its purpose, whether the door-beds are inside or outside. There is room enough, too, for a chiffonier and mirror.

Between the dressing room and bath is a large clothespress with full length mirror in the door. By closing the doors in the alcove so formed, the dressing room and bath can be cut off from the main room. A second spacious closet is built in at the foyer entrance.

A dining alcove and kitchenette in tandem, occupy the space at the right of the living room. Full sash doors with curtains separate the dining alcove from the larger room, and high, built-in china closets divide the alcove from the kitchenette. The furniture of the alcove, as shown in one of the illustrations, consists of a gate-leg table seating four. A folding extension-top may be used to increase the seating capacity to six. A console table is used for service. Electric outlets for heating pads, percolators and toasters are so located that a full meal can be served at the table.

The kitchenette is quite a marvel of efficiency. It is finished in white enamel with sanitary base and linoleum floor. One can stand in the middle of the floor and reach all the necessary appliances with scarcely a single step. At the right is the sink with integral, enamelled-iron drainboard and back of it the dumb-waiter. At the rear is a built-in broom closet and folding ironing board. On the left is a built-in, universal ice chest and cabinet, with a full complement of utensils, a sliding service board and food compartment with vertical shutter. Back of it is the gas range in an insulated compartment.

By an ingenious arrangement of the waste-gas flue leading from the range, the kitchen is ventilated through a wall register. The suction is

A TWO ROOM SUITE

created by the outflowing products of combustion.

In all the rooms, the radiators are recessed behind ornamental grilles.

The apartments are rented furnished or unfurnished, and are decorated to suit the tenants' taste. The small amount of furniture required

should make a special appeal to young people in the early period of married life. The full equipment to furnish the apartment includes only a living room suite, a large or several small rugs, a chiffonier, a gate-leg table and chairs and a serving table, all of which can be purchased for well under one thousand dollars. That is about the average cost *per room* for furnishing the usual three or four room apartment at prevailing prices.

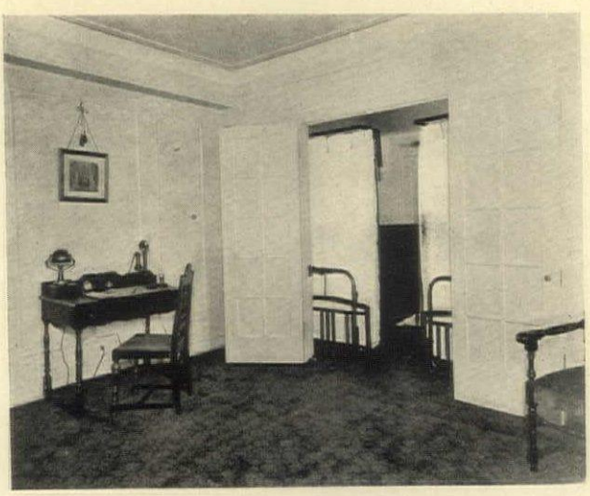
The building management maintains service personnel to relieve tenants of the more laborious details of housekeeping. Maid service, for example, is available at a nominal cost per hour. Housecleaning and the preparation of meals are thus eliminated. There are no "days out" to break up one's program, nor any interregnum between the coming and the going maids.

DINING ROOM ALCOVE AS SEEN FROM LIVING ROOM

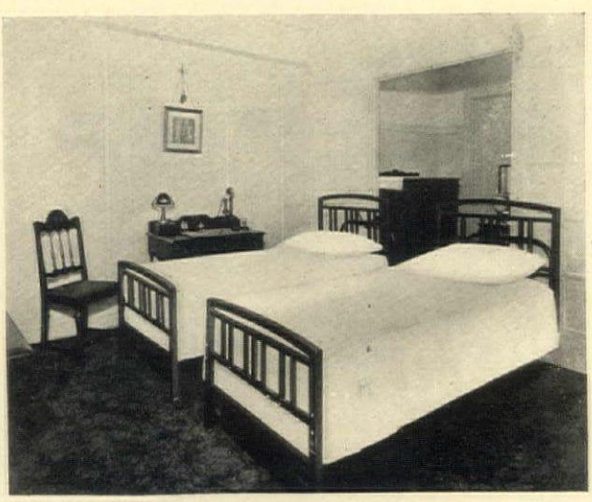
A central vacuum cleaning plant, with operators, is at the disposal of the tenants. Another convenience is the central ice storage room. This, by the way, has been found more economical than an ice plant with piped refrigeration. For the same reason gas ranges receive the preference. While the electric range is being more highly developed, it is not yet an active competitor of the gas range in first cost and operating expense.

The problem of subsistence is easily solved. A food shop occupies part of the basement floor. It is a combination of shop, tea room and restaurant. Both cooked and uncooked food is sold. Some of the tenants leave a set of service dishes at the shop. If they do not care to go to the trouble of preparing a dinner, they telephone their orders to the shop where they are cooked and delivered to them in their own service *via* the dumb-waiter.

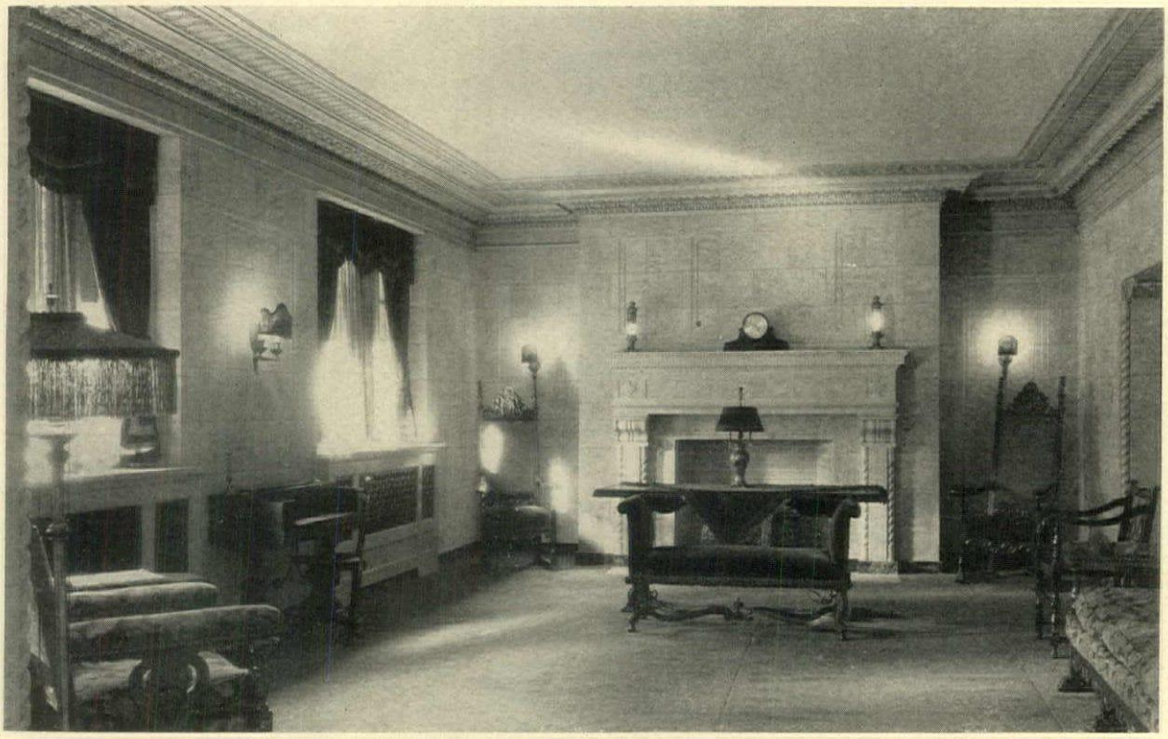
One of the really novel and useful features of this particular chain of apartments is the provision of public rooms for the general use of the occupants of the building. Confinement in one's own apartment grows monotonous now and then, and one feels the need of change or companionship. Besides, it is often desirable to meet visitors outside one's own suite. With this in mind, the management has reserved space for a lounge room, attractively finished and furnished, on the main floor of the building. On the roof there is an enclosed roof garden with wicker furniture, rugs and so on. Both these features have met



LIVING ROOM WITH BEDS DRAWN INTO DRESSING ROOM



LIVING ROOM CONVERTED INTO A SLEEPING ROOM



TENANTS' LOUNGE, FIRST FLOOR

ENTRANCE HALL

THE JAMES, SYRACUSE, N. Y., A ONE ROOM APARTMENT HOUSE

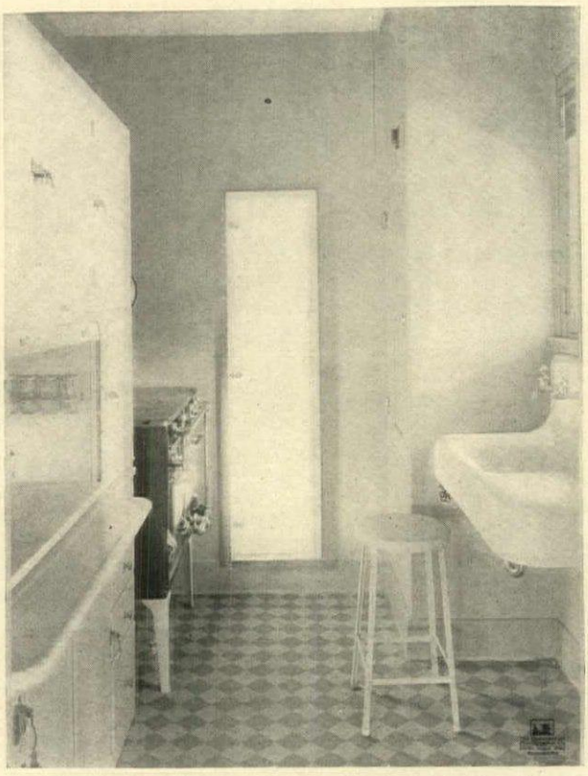
R. A. McHALE, ARCHITECT

DETAIL OF PRINCIPAL ENTRANCE

THE JAMES, SYRACUSE, N. Y., A ONE ROOM APARTMENT HOUSE

R. A. McHALE, ARCHITECT

with instant favor. They have been important factors in creating an atmosphere of friendly interest among the tenants, quite foreign to the usual apartments.



KITCHENETTE AS SEEN FROM DINING ROOM

Other hotel conveniences are the house telephone, the mail chute and burglarproof storage rooms. The passenger elevator is of the dual control type so that it is in service twenty-four hours a day. The freight elevator is of the usual type. Household waste is conveniently disposed of; on each floor a door leads to the incinerator chute, so that there is no accumulation of waste in the kitchens. Nor is the dumb-waiter soiled by the daily collection of rubbish.

The type of construction and finish of the building itself compares favorably with that of most good hotels. The structure is fireproof throughout, so that the floors and partitions are sufficiently deadened to be soundproof.

The illustrations fully show the interior finish.

The rent of a suite consisting of living room, dining alcove, kitchenette and bath is hardly more than half that of the usual three room suite in the same locality. Of course, it varies slightly with the building and the situation of the suite in the building; but in general it is far below that of any apartment of the same class.

A glance at the floor plan will explain the low rentals. Each one room suite is a rectangular unit covering from 400 to 600 square feet. When these units are arranged side by side the rental space efficiency, per floor, is very high. Apart from the stair and elevator wells and the public corridor there is no waste room. In apartments having suites of three rooms and more, loss of space in interior passageways, irregular arrangements necessitated by legal requirements and so on, are unavoidable. Actual comparison between apartments laid out for one room suites and those designed for three or more, with exactly the same floor area show a rental efficiency thirty-five per cent greater in favor of the one room layout.

Buildings of this class require corner locations, for the suites are necessarily placed side by side along the exterior walls. The width of the lot is not material. One of the most efficient floor layouts had been worked out for a plot forty-five feet wide and one hundred and fifty feet long with streets on three sides. In plan, the building is U-shaped. There are seven suites on each floor along the one hundred fifty foot dimension. The minor dimension of this section is twenty-six feet, that is the depth of a living room plus the width of the corridor. There are no suites opening on the interior court, but the two upper branches of the U contain two three room suites.

Another building occupies a lot one hundred by two hundred feet. Here the shape in plan is roughly that of a capital I. The arrangement of rooms differs from the first in that the two rows of suites with a central corridor occupy the stem of the I. In this building court rooms are not objectionable as the adjoining property is a city park.

In general rectangular corner lots of almost any width can be efficiently adapted, provided that the component elements of the building plan have a width of about twenty-five or fifty feet. The stairs and elevators, as in most apartments, are placed at the intersections of the wings with the body of the building.

There is no apparent reason why the one room apartment should not extend its popularity to cities of any class, provided that it is operated on some such plan as that indicated. It reaches a large section of the tenant-market, it shows a greater net return upon the investment than other types and it is self-advertising. From the owner's viewpoint it has much to commend it.

UNECONOMIC PRACTICES *in the* BUILDING INDUSTRY

Preliminary Report of the Committee to the New York Chapter, A. I. A.

WHEN an industry, profession or an individual encounters adverse conditions, it is usual to seek the cause. The condition of the building industry during the past few years has been a matter of concern to the architectural profession. It was decided by the New York Chapter, A. I. A., to appoint a Committee on Uneconomic Practices in the Building Industry. It is common practice for such a committee to survey the entire field and often to see the "mote that is in thy brother's eye." The investigations made by this committee indicated that some elements of the building industry charged architects with certain derelictions of duty and as a result the committee then gave first attention to the profession. After careful consideration of the mass of data collected it was decided that it should be classified under three heads: *One:* Constructive criticism, a mere statement of which is both interesting and helpful. *Two:* Criticisms involving questions of policy which were debatable or required further inquiry and development before they could be presented for the consideration of the Chapter. *Three:* Criticisms involving the relationship of the architect and owner and of the owner to the job.

The committee submitted as a preliminary report, on May 6, 1924, data under the first classification.

CLASS I—COMMENTS

The committee is not prepared to endorse all of the following statements, but it has included those criticisms which it interprets as more or less constructive. They are:

A. Professional Qualifications—1. That there are still isolated cases where a mask of temperament is used to cloak actual ignorance and incapacity.

2. Artistic taste, knowledge of construction, and business ability are not incompatible qualities.

B. Preliminary Estimates—1. That contractors are asked to estimate work in detail and sometimes in competition when it is well understood on the part of the architect that there is a real and substantial doubt of the job going ahead, under which conditions an approximate or preliminary figure would serve the purpose.

C. Estimating—1. That frequently too many contractors are requested to figure a job. Frequently those invited to bid are not of the same class as to the quality of work performed or as to ability or facilities. At times this variation ranges from excellent to very poor. Some hold that the number of bidders should not exceed six though under special circumstances there may be good reasons for an increase in this number.

D. Supply of Plans and Specifications—1. That lower bids may be obtained if at least two complete sets of plans and specifications be issued to each bidder.

E. Adequate Time in Which Estimates May Be Prepared—1. That it is quite usual for the time allowed for estimating to be so short as to preclude careful and close figuring causing losses, misunderstandings, and bills for extras.

F. Contractors Unknown to Architects—1. That expense and delay may and often do occur when an architect allows the owner to select a contractor whose organization, credit, and qualifications for a particular type of work are unknown to him. Inquiries should be referred to material dealers and subcontractors in addition to brother architects, banks, and owners of previous jobs.

G. Waste Where Plans Are Incomplete—1. That waste, inaccuracy in figures, loss of time, changes and errors, and a host of other troubles arise where plans are issued in an incomplete form and before the final layouts and details have been determined.

2. Delayed Details—That there is general failure to prepare and deliver details in sufficient time to prevent an uneconomic loss to the contractor and often actual delay to the job.

3. Checking—That inaccurate or incomplete checking of plans and specifications before sending them out results in inaccurate figures, changes in the work and claims for extras.

4. Faulty Specifications—That specifications are encountered which are faulty, apparently having been copied and recopied from previous forms until they were little more than verbose wordy treatises devoid of exact and definite meaning, frequently too long as well as poorly indexed.

5. Trade Divisions—That often there is an apparent lack of knowledge of jurisdictional trade awards or indifference to their effect. Specifications appear which are not accurately divided as to trades, or items are omitted in their logical place and included under wrong trades. This leads to additional costs, especially where they appear more than once and under different trades.

6. Changes During Estimating—That waste, misunderstandings, and worse are apt to occur if interpretations, changes, or revisions are made while the work is being figured, unless a uniform written notice be sent to all bidders, enabling the architect to have a complete record. No changes, interpretations, or revisions should be made later than 24 hours prior to the time set for the receipt of bids.

7. Schedules of Work—That expensive delays and a breakdown in the co-ordination of the work occur if the architect departs from a schedule of work which he may have prepared and put into operation, unless an agreement with all concerned has been reached.

8. Inaccurate Delivery Date—That inaccurate dates for the delivery of materials involve extra cost for rush work, delays, extra freight, truck handling, and warehouse charges, etc.

9. Approval of Shop Drawings and Samples—That the taking of an unreasonable length of time in the approval

of shop drawings or in the consideration of samples submitted causes hardship to the contractor. When the contractor requests changes or substitution, he must allow for the necessary time for investigation.

10. Tests—That waste and misunderstandings will be prevented if there be definite statements as to who shall authorize and make tests. That tests shall not be specified unless they will be actually required; and furthermore the number of tests should be stated and all additional tests should be paid for in accordance with an agreed schedule.

H. Specifications—1. Objectionable Clauses—That estimators regularly add an allowance to the cost of various items to which may be attached any of the following clauses: "in the opinion of the architect," "as required," "as per detail to be furnished," "equal to," "equivalent to," "adequate," unless there be some balancing clause which will remove the uncertainty as to what will be required.

2. Protective Clauses—Objections were raised to the retention in specifications of the so-called protective clauses which recite that the specifications shall be construed to include items shown on the plans but omitted from the specifications and *vice versa*.

3. Standard of Quality—The opinion was expressed that no attempt should be made to describe "quality" and "workmanship" in words. Reference to a completed example or a specific sample should be used to define the work.

4. Guarantees—That those which are unreasonable are uneconomic and that a guarantee should not be required on a result to be obtained by following a method or process given in detail in the specifications.

That if the architect is sure of his method the guarantee would seem to be unnecessary, since under the contract, the contractor may be held if the work has not been executed according to the specifications.

That great care should be exercised in the wording of guarantees, it being asserted that the best guarantee consists of the integrity of the contractor or manufacturer.

That there is a movement on foot at the present time to limit all guarantees to a year's time. Others called attention to the fact that length of guarantee should depend upon the requirements of the individual case.

5. Mechanical Equipment—That it is uneconomic to pass the responsibility to the contractor by specifying the performance expected of mechanical equipment, instead of specifying the materials, the equipment itself, or giving definite rated capacities.

6. Cross Reference Needed—That the phrase "except where otherwise specified" is particularly annoying to estimators unless information is given as to where the exceptions may be found.

I. Contractual Relations 1. Authority for extra charges—That the consent of the owner to extra charges or allowances and changes involving extra work and costs, should be obtained in writing, and that in certain classes of work, where prompt decisions cannot be obtained from the owner, arrangements should be made beforehand for certain discretionary powers to be delegated to the architect.

2. Extra Charges How Confirmed—That orders for changes and for additional work which may involve additional compensation and which may be given during the progress of the work, shall be given in writing and, if in the exigencies of the work, such should be given orally, then should be confirmed in writing within 24 hours; and further that such orders should state the additional amount to be paid the contractor or define the manner in which this shall be determined.

3. Delays in Payments—That it is uneconomic for an architect to delay, without just cause, the issuing of his certificate for payment properly due to a contractor and likewise for the owner to delay the payment thereof.

Some suggest the incorporation of a clause in the contract that, after a delay of ten days by the owner, interest at the rate of 6% from the date of issue of the certificate shall be charged, and one critic suggests that 2% should be added to the face value of the certificate if unpaid in ten days.

4. Compensation for Delays—That extension of time on a contract is not necessarily proper or adequate compensation where the delays are not the fault of the contractor.

5. Payments for Materials—Comment was made that costs were sometimes increased because of interest charges, where payments are only allowed for materials incorporated in the work and no allowance is made for materials delivered to the job. In some cases 15% reserved is held to be needlessly high, particularly where careful inspections are made by the architect, and in cases where the withholding of definite amounts may suffice to cover questionable items.

J. Architects, Their Special Faults—1. That because some architects and superintendents have a reputation for strict legal interpretations of the plans and specifications and the making of arbitrary rulings, many contractors always add an allowance to their figures for legal fees and for contingencies.

2. That where any of the required functions of an architect are considered as lacking, i.e., executive ability, technical knowledge, and artistic training, they should be supplied by personnel, and expert advice freely sought.

3. That architects do not take criticism kindly and therefore contractors hesitate to point out errors and feel that they are expected to cover the architect's mistakes.

4. Consideration—A few comments received stated that architects showed no "consideration" for extra expenses involved, even upon subsequent jobs. It is unprofessional for an architect to force a contractor to bear an expense for additional work not called for in the contract. It is unethical and unmoral for an architect to condone the carrying over of masked charges from the account of one owner where they belong to the account of a second owner innocent even of their existence.

5. That architects, especially the younger men, are sometimes unable to control their clients and are therefore not always impartial and likely sometimes to be unfair to contractors.

The preliminary report on Class II will be based on the outline given below and the committee will appreciate suggestions from those who are interested. These should be addressed to Arthur C. Holden, Secretary, 101 Park Avenue, New York City.

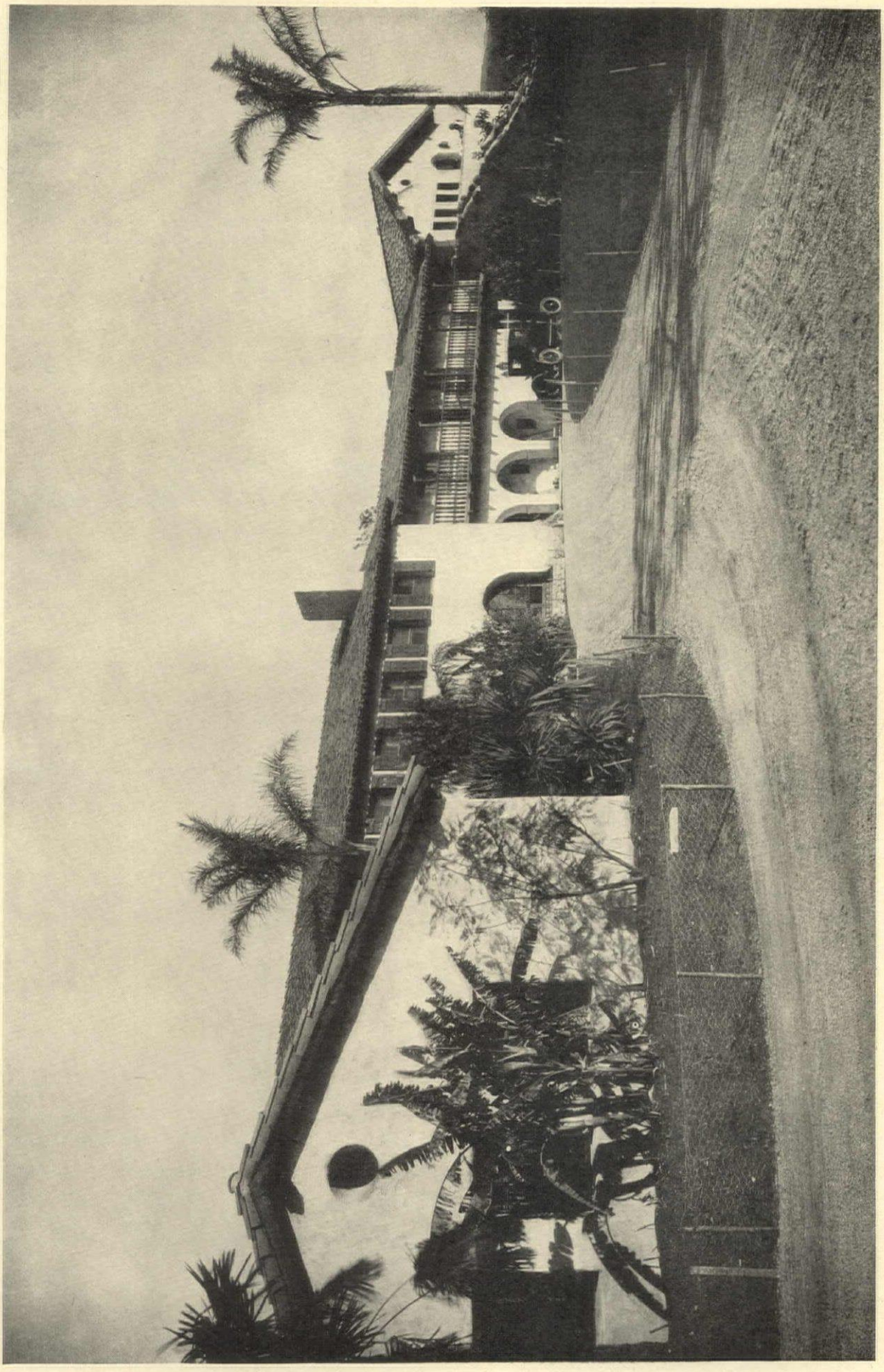
Outline of Class II.

Before presenting the following to the Chapter the committee proposes to prepare a brief resume of the discussion and recommendations on each point.

1. Waste in Choosing the Architect. 2. The Architect's Training, Education, and Experience.

3. The Architect's Knowledge of Costs. 4. The Architect's Lack of Information in regard to Local Codes and Ordinances. 5. Tendencies and Policies in Specification Writing. 6. "Changes and Omissions" in Drawings and Specifications.

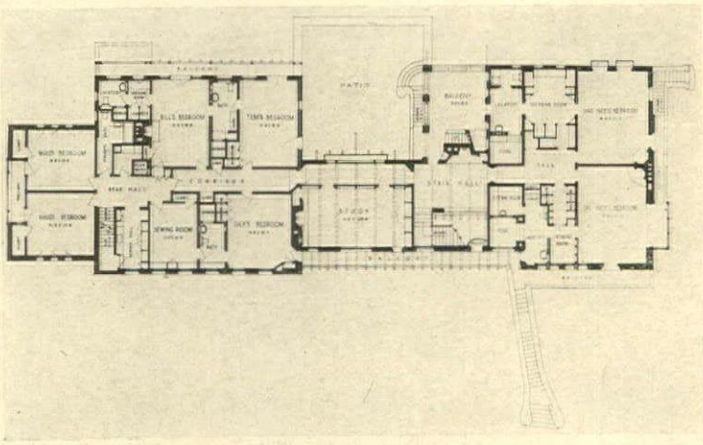
7. Standards and Standardization Policy. 8. The Architect and the Financing of the Building.



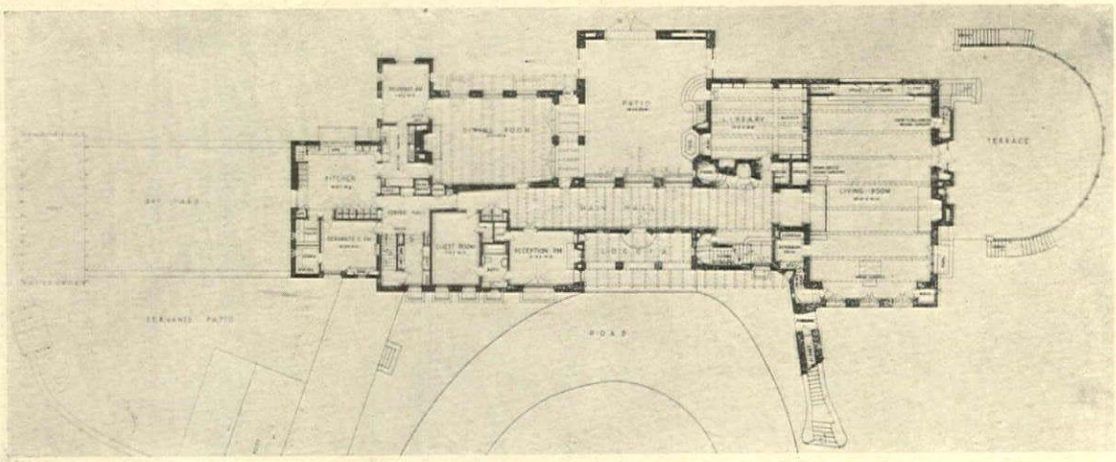
RANCH ESTATE OF THOMAS H. INCE, BEVERLY HILLS, CAL.

ROY SELDON PRICE, ARCHITECT

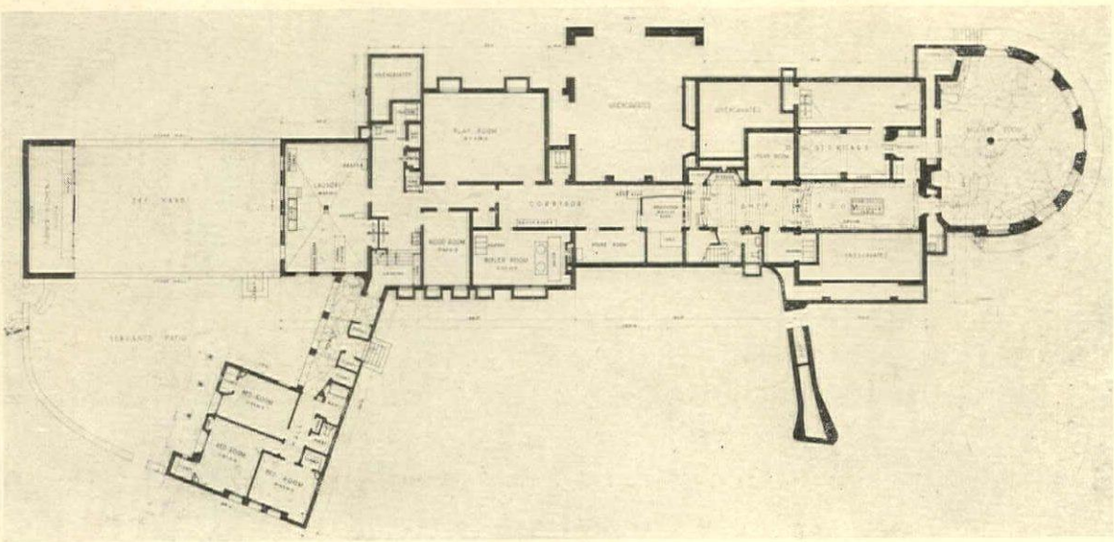
(See plans on back)



SECOND FLOOR PLAN



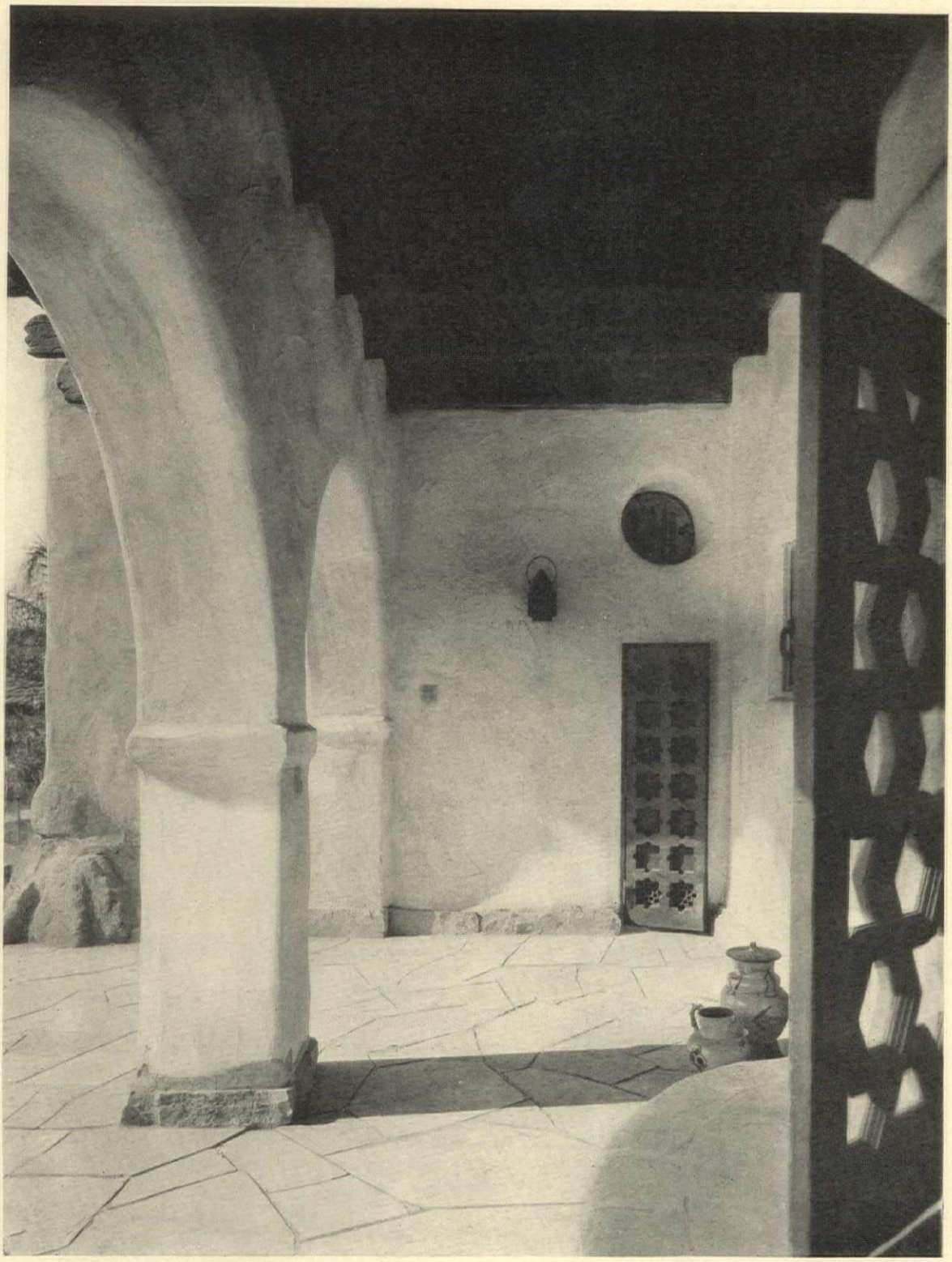
FIRST FLOOR PLAN



BASEMENT PLAN

RANCH ESTATE OF THOMAS H. INCE, BEVERLY HILLS, CAL.

ROY SELDON PRICE, ARCHITECT



MAIN ENTRANCE

RANCH ESTATE OF THOMAS H. INCE, BEVERLY HILLS, CAL.

ROY SELDON PRICE, ARCHITECT

(See description on back)

RANCH ESTATE *of* THOMAS H. INCE, BEVERLY HILLS, CAL.

ROY SELDON PRICE, Architect

DIAS DORADOS, as Thomas H. Ince calls his ranch estate in the Beverly Hills, California, is an unusual group of buildings in a section where the picturesque in architecture predominates. In addition to the house, the ranch units consist of a duck house, pigeon tower, chicken run, carpenter and smithy shops, hot house, garage, gardener's cottage and stables. The house and buildings are all of the most substantial construction and produced by Mexican labor. The various decorative elements of tiles, textiles and ironwork are also of Mexican labor, and the whole achieves a result that carries to the finest completion the traditions of the section. The long, low plaster walls, simple roof lines, arches and natural rock work are the very spirit of the Padres. One feels, more than sees, the softening charm of age this group suggests.

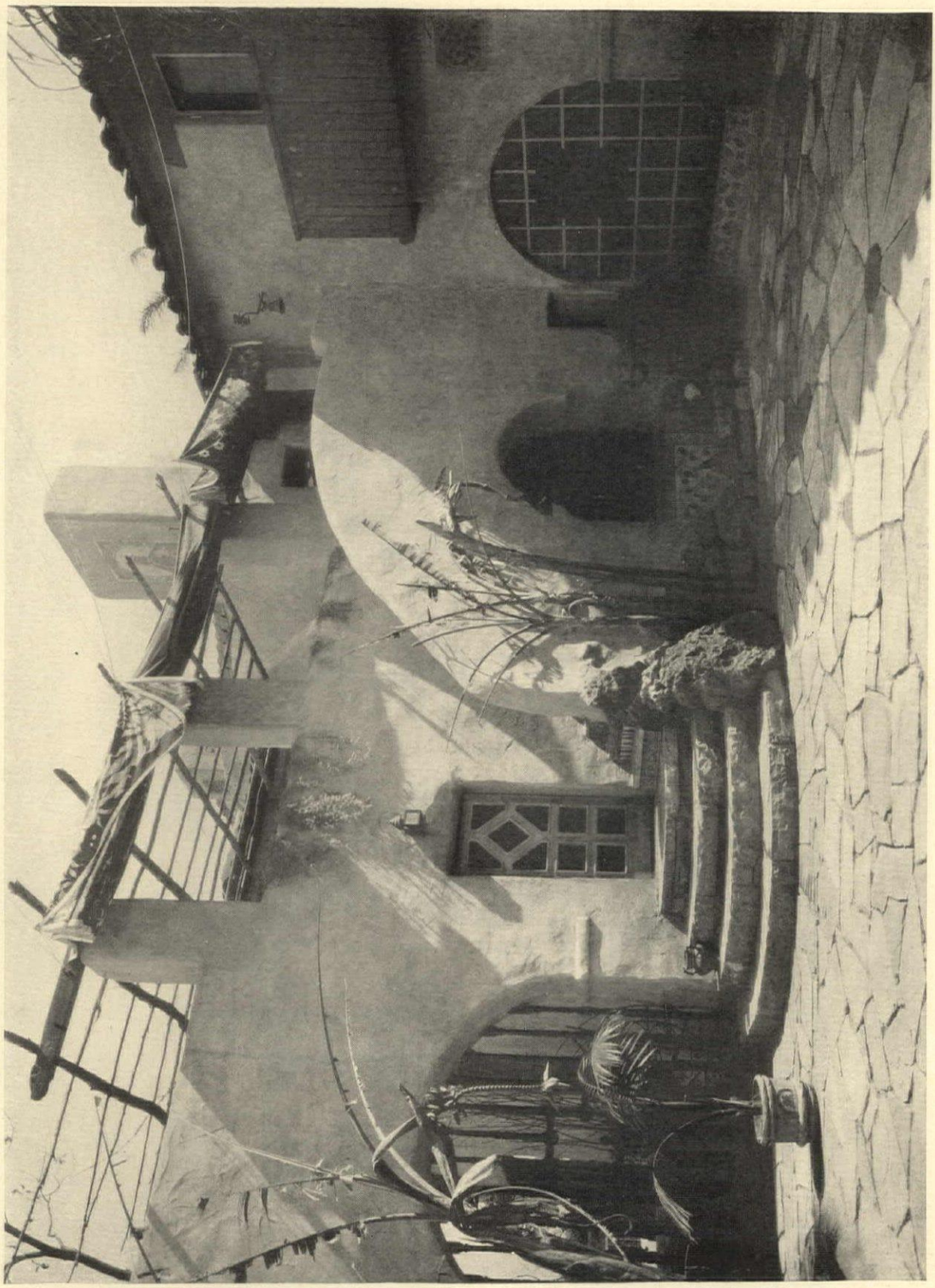
The interior which carries out the general Spanish style, has with fine restraint been modernized to give comfort and convenience. The general character of the more important rooms may be judged by the illustrations. The bathrooms are finished in tile, carefully designed and sparingly used. There is an interesting stone billiard room, and for the convenience of the owner, who is a large motion picture producer, a novel projection room has been installed. The interior is a clever reproduction of an ancient Spanish pirate galley —old worn benches—caulked sloping deck floors, ladder, rig and sails, portholes—faint tropical seas painted on either walls—and at the front end, over which falls the screen, is a doorway in which stands a vivid leaded glass pirate. It is an entertaining transition—entertaining, by way of a rock stair, this dim place, lighted by dull red, blue and yellow ship lights. These whimsical additions lend a diverting charm and a certain freedom to the scheme of the place that is delightful.

The water system is self contained. A deep well supplies abundant water to the reservoirs. Booster pumps maintain ample pressure for all the buildings, pools, irrigation and fire protection. A softening plant removes all alkali from the water supplied to the buildings. Cross connections make it possible to work all pumps on the fire lines, or to use city water or the swimming pool water in an emergency. The entire water plant is automatic, being operated electrically with alarm bells and telltale lights up in the residence to show when any part is not functioning perfectly. Even the lawn sprinklers are operated by a clock system doing their work after 1 A. M.

RANCH ESTATE OF THOMAS H. INCE, BEVERLY HILLS, CAL.

ROY SELDON PRICE, ARCHITECT

Stairway leading to wading pool and lake plunge



SECTION OF PATIO

RANCH ESTATE OF THOMAS H. INCE, BEVERLY HILLS, CAL.

ROY SELDON PRICE, ARCHITECT

PATIO SEEN THROUGH TRELLIS

RANCH ESTATE OF THOMAS H. INCE, BEVERLY HILLS, CAL.

ROY SELDON PRICE, ARCHITECT

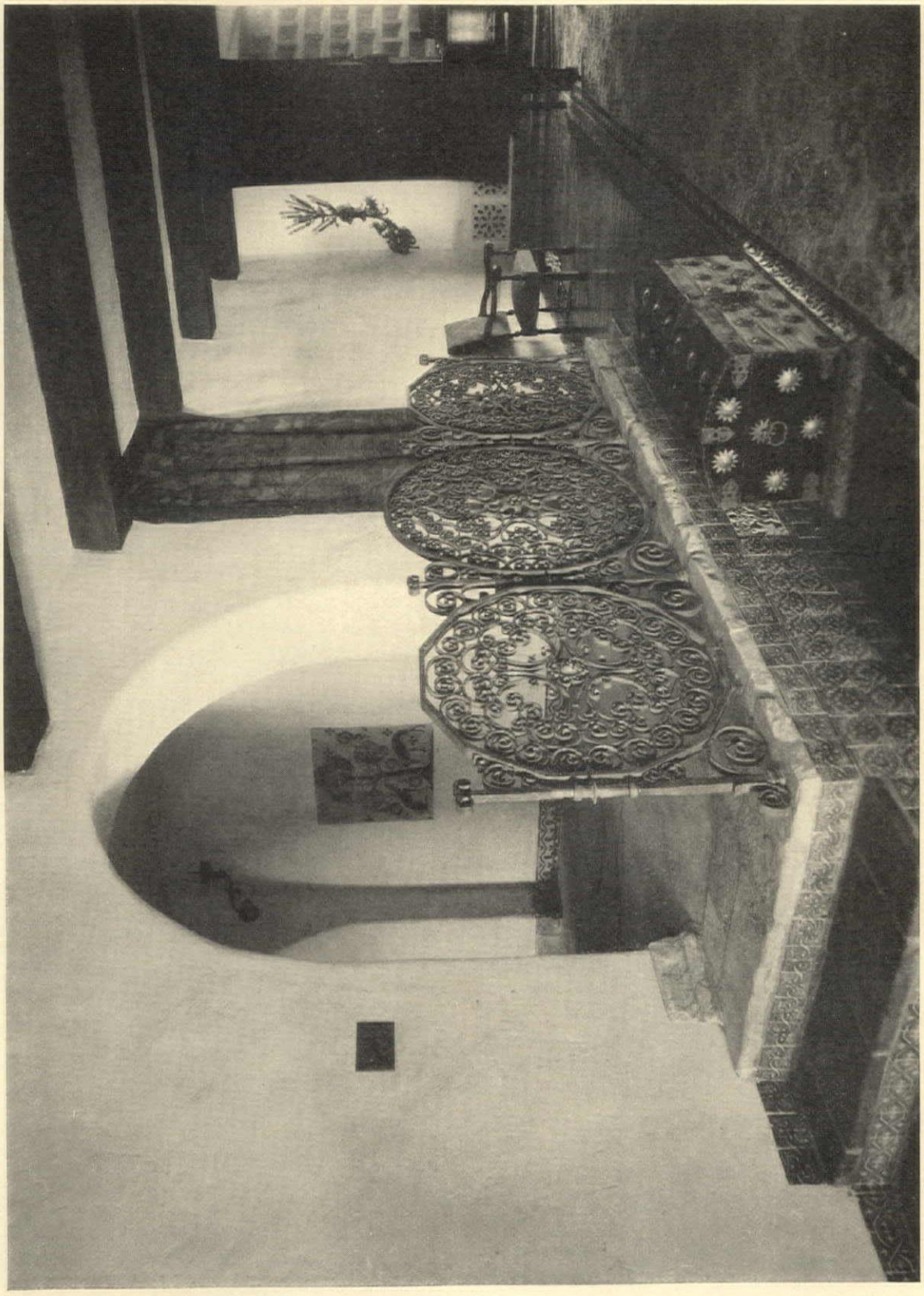
The vine work is of leaded glass

MAIN STAIRCASE

RANCH ESTATE OF THOMAS H. INCE, BEVERLY HILLS, CAL.

ROY SELDON PRICE, ARCHITECT

Imported Mexican tile and wool hangings; hand carved beams



SECTION OF LIVING ROOM
RANCH ESTATE OF THOMAS H. INCE, BEVERLY HILLS, CAL.
ROY SELDON PRICE, ARCHITECT
Tapestry conceals organ chamber

DINING ROOM

RANCH ESTATE OF THOMAS H. INCE, BEVERLY HILLS, CAL.

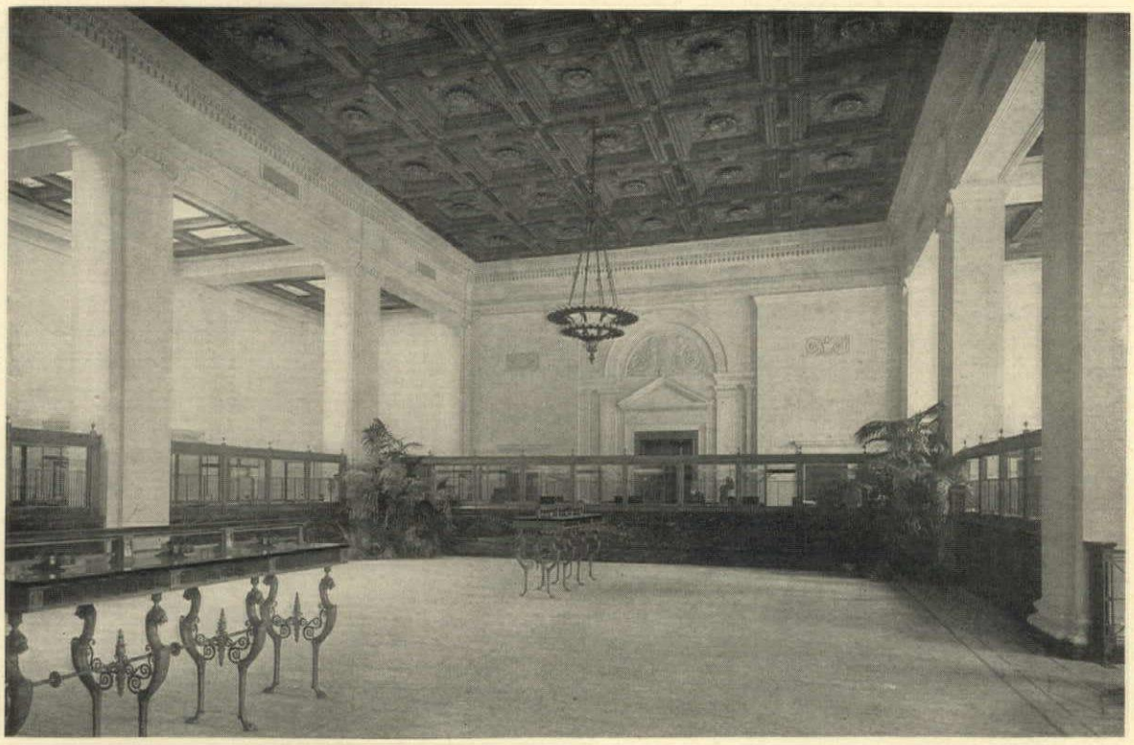
ROY SELDON PRICE, ARCHITECT

INTERIOR ARCHITECTURE

Bank Interiors

A BANK interior depends so largely on the chaste lines of its architectural treatment in making its decorative appeal that its design is seldom, if ever, considered out of the province of the architect. Churches, theatres and other public halls and rooms rely substantially on furniture, its covering and the drapery materials for the success of their decorative scheme, but a bank with its lack of any such decorative furnishings, is in a class by itself and offers quite a different proposition. Dignity and solidity, characteristic of the banking business itself, are the two vital elements which the design of a bank interior should possess; but coupled with these, conspicuous only enough to make itself felt, should be an air of cheerful friendliness and bright cordiality. In laying out the plan of the banking space the actual requirements of that particular institution are of first importance and consideration. Various types of banks, as savings banks, trust companies and private banks, each have quite different services to perform and the arrangement of their banking facilities must conform to their particular requirements. Further than that, each bank has to a certain extent its own methods, and its plan must be shaped by efficiency and economy as related to the methods of that particular bank.

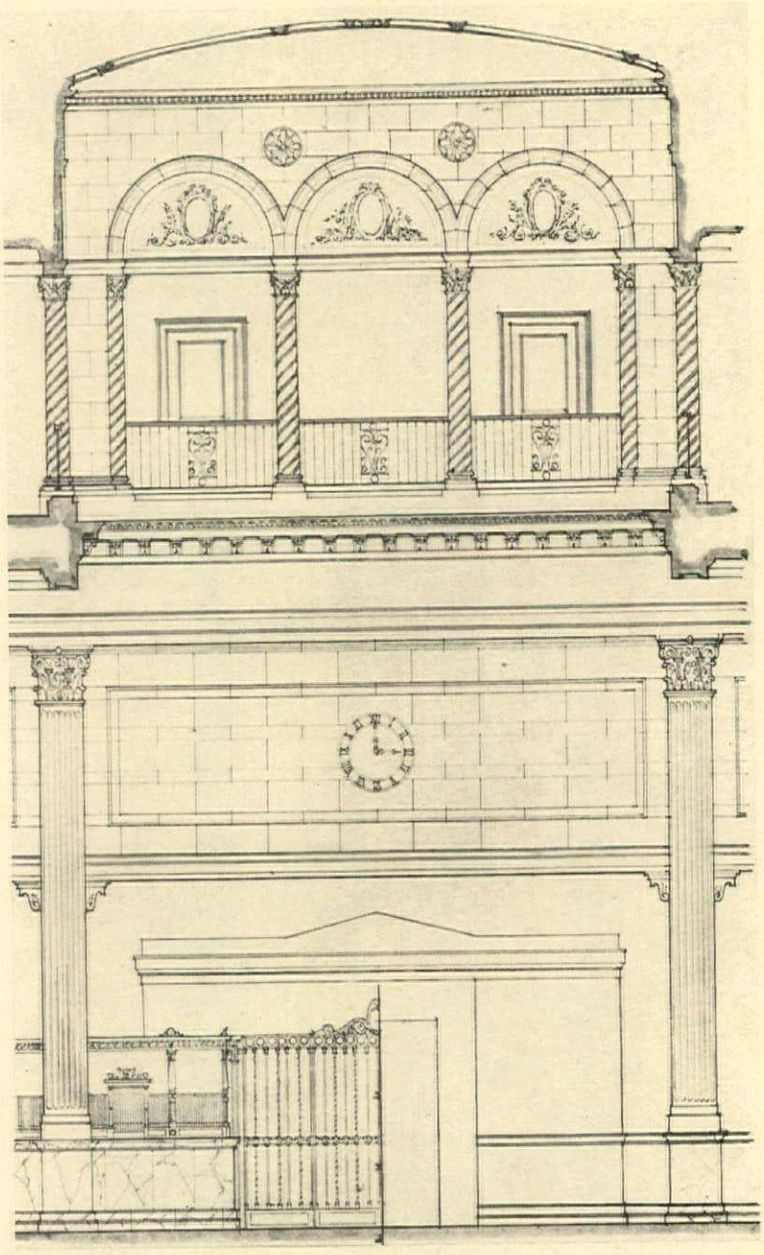
Perhaps the one most important feature of the floor plan of any bank is the position of the entrance door. Speaking of the design of the exterior of a bank building, it has been said that as the face is to the man so is the entrance door to the bank. Alfred C. Bossom, who specializes in bank buildings, explains this as follows: "The possibilities of the doorway are increasing rapidly, and if all advantages are taken it can form one of those subtle attractions and advertising agencies



BANKING ROOM OF THE FIRST NATIONAL BANK OF JERSEY CITY, JERSEY CITY, N. J.

ALFRED C. BOSSOM, ARCHITECT

The walls built of Noysette stone give a dignified and interesting architectural treatment, with the lower part of the screen in carefully selected black and gold marble, surmounted by a golden bronze screen. This severe arrangement acts as a frame for the ceiling, of natural wood, with ornament picked out in strong colorings. The floor is of Travertine in large squares. The check desks, in center of the large floor, are interesting on their own account in a Pompeiian design, of bronze, in keeping with the screen



AN ELEVATION OF THE BANK OF CONEY ISLAND, CONEY ISLAND, NEW YORK

HOLMES & WINSLOW, ARCHITECTS

A circular balcony on the second floor makes an interesting view from the banking room and a skylight in the dome above floods the entire space with daylight

that work day in and day out for three hundred and sixty-five days in the year at no cost whatever after once being completed. If it is handled suitably it can actually, by the interest it has in itself, excite the curiosity of the passerby to further interesting surprises within, and, once within, the banker can safely be relied on to do the rest. By so locating the main vault door, for instance, in alignment with the entrance door, it gives an interesting vista at which the layman never tires looking, and, by so doing, creates a sense of security that the frankest publicity alone can provide."

Thus, it can be seen what a decided effect the position of the door has on the entire plan of the interior. Its location affects the position of the officers' quarters. The mystery and secrecy with which the old-time banking business was carried on have now all been done away with, and even the officers today pride themselves on their accessibility to the public. Personal contact with its customers is one of the main selling points of a modern bank, and officers' desks are often located directly in the banking space, with only a low rail to suggest privacy. It might be said here that, on account of the physical impossibility of allowing this personal contact with all the customers of a savings bank, officers of these banks still retain their private offices. The planning of the tellers' desks and the surrounding banking screen must be governed by the requirements of each particular bank, at the same time being accessible to the entrance door and convenient for the bank's customers.

In order to establish the impression of dignity and solidity, a proportionately high ceiling is desirable, for massive, high walls give a monumental appearance which bespeak these two qualities. The ceiling height affects to a great extent the wall treatment, just as the design of the walls affects the plan of the ceiling. Pilasters, for instance, might be appropriate on certain high walls, while their arrangement would govern materially the panelling of the ceiling. Because of its appearance of strength, combined with its interesting colors and texture, marble and stone of certain kinds are considered the most suitable material for walls of banks. Where the cost of covering the entire walls with marble or stone prohibits the use of either one, the one or the other may be combined with plaster with pleasing results at much less cost. The effect, however, of even a low marble wainscot, which could also be carried around the lower part of the screen, adds very decidedly to the impression of stability. It is an important fact that the bank architect should be given a pretty good idea of what the officials are willing to spend for their new build-

THE GREENWICH TRUST COMPANY, GREENWICH, CONN.

ALFRED C. BOSSOM, ARCHITECT

The severe lines of the walls and screen are relieved by a beautiful ceiling, an exact reproduction in full color of a ceiling in the Villa Madonna, Italy. The colors mellow each year so they are much more interesting today than when the painters left them. The floor and screen are of selected Botticino. The ceiling chandelier is designed in keeping with the ornament of the ceiling

SEABOARD NATIONAL BANK, NEW YORK CITY

ALFRED C. BOSSOM, ARCHITECT

Erected on a kite-shaped corner site on a valuable piece of property, and controlled by the New York zoning laws, every inch had to count, so the working space and bank screen followed the perimeter of the lot, leaving a square public lobby. The mezzanine follows the line of the screen. The mouldings were very much suppressed so as to increase the illusion as to height. The marble of the screen is gray Tennessee; the floor is of rubber tile to harmonize with the marble, and the columns are of green Scagliola, of similar appearance to the polished green granite columns on the outside of the building

ing so that he may put the money in the place where it will do the most good. Above all things, insist on good materials! Quality in materials must not be sacrificed for a more ornamental screen or a more decorative ceiling. Simplicity in first class materials denotes security and permanency which cheap ornament can never suggest.

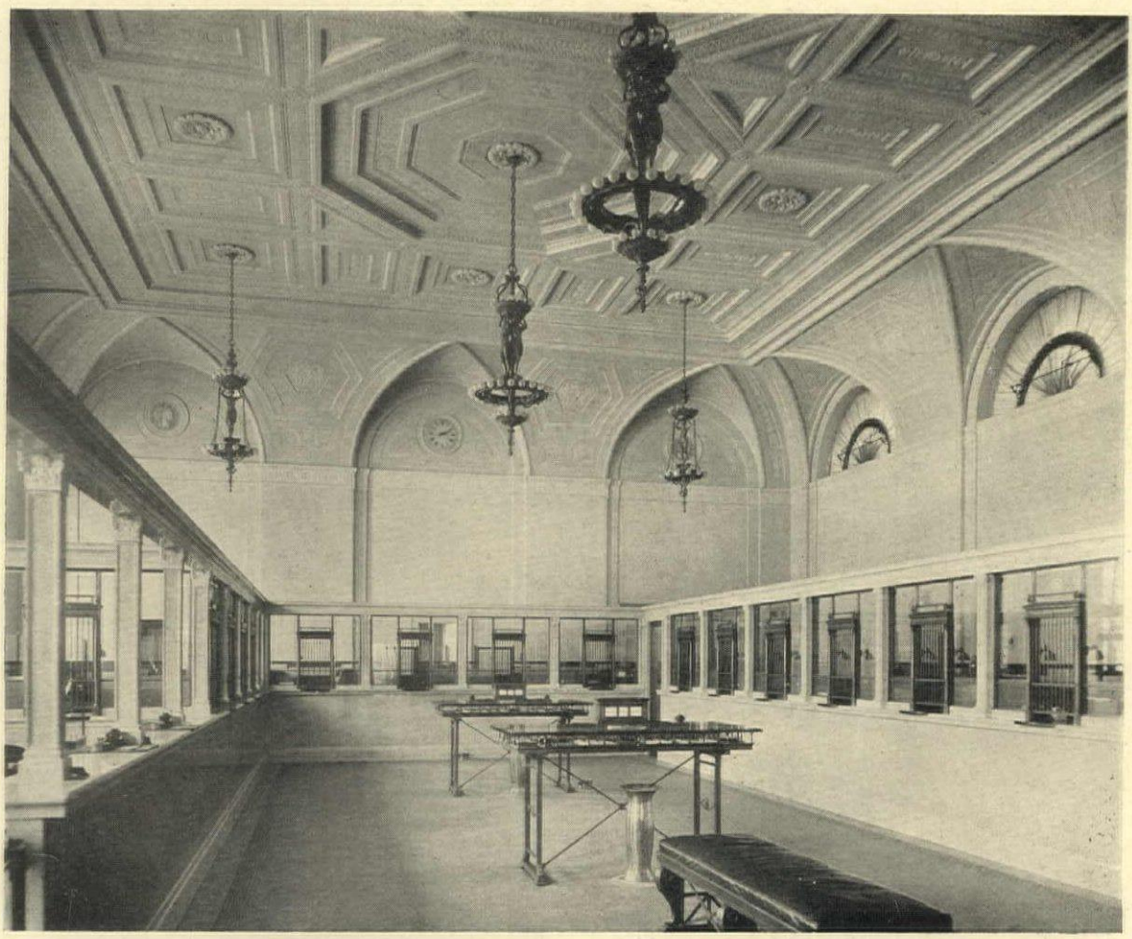
The proportions of old Greek and Roman architecture and of the later Renaissance are symbolic throughout, of simple stability, and are thus very adaptable to bank designing, especially when carried out in their original medium of expression,—marble or stone. The contour of the mouldings, the detail of the ornament, together with the freedom in the use of colorful decoration which these styles incorporate appeal strongly to the bank architect.

Charles A. Holmes, of Holmes & Winslow, says: "I consider the banking screen the feature of the design of the bank interior. Interest, but simplicity, should mark its design, which should no longer be made to look like a jail window or to effect substantial protection for the bank's cash." By reason of the time that the customers are required to stand at the tellers' wickets, the public comes in closer contact with the screen than with any other portion of the bank's equipment. This fact alone establishes it as the feature of the decorative scheme. Combined with this close scrutiny of the customers is its position in relation to the level of the eye, which together not only require its design to be interesting and worthy of careful study and examination, but also of a scale much nearer human dimensions than any other detail of the decorative treatment. This will make it stand out against the wall background as a feature of the scheme, but there must be evident some note of unity between it and the walls. Very often good results are obtained by forming the lower screen of the same material and in the same design as the lower wall, so frequently marble, and surmounting it with a metal grille for the tellers' wickets. Sometimes the upper screen includes pilasters and capping of the same marble, or whatever the material may be, and the resulting panels only are of metal. In less expensive buildings a wood wainscot on the walls continues as the lower part of the screen and the upper part is of the same wood or of metal. As in other details, no rules can determine the selection of these materials which after all is governed so decisively by the allowance. With unlimited means, the lower screen of appropriate marble surmounted by a bronze grille is the most desirable. The design of the upper screen, so often marked by striking contrast in material with the lower part, should emphasize in its line and composition this contrast in color and texture.

The check desks, often the only pieces of furniture, if they could be so called, which appear in the banking space proper (for this does not include the desks and chairs in the officers' quarters) must be of the same scale as the screen for practically the same reasons. It is advisable, therefore, to include a certain unity in their design, which either necessitates the use of the same material as used for the screen or in some way injecting it into the design of the desks. If it may be best to construct the desks of the same material as the lower screen, as a marble, the scale must be in those proportions and the details should

harmonize with those of the lower screen. Sometimes, especially where floor space is at a premium, the check desks are attached to the walls. In such cases, their design must conform in some way to the wall treatment, for more so than in any other type of building should the furniture, so called, of a bank be a part of the architectural design. In very large banking rooms, where the check desks stand at a considerable distance from the screen, there is not that necessity for unity with the screen such striking contrast to all other portions of the scheme, yet perfectly harmonious to them, that the desks are made a feature apart from the setting.

From a purely ornamental viewpoint, the ceiling is generally the feature of the bank interior, as it is so often in large public rooms. Such a severe and dignified scheme of design as has been here suggested, applied to any room requires a certain amount of ornament to give it correct bal-



MAIN PUBLIC LOBBY, UNION TRUST & SAVINGS BANK, DUBUQUE, IOWA

WEARY & ALFORD COMPANY, DESIGNERS

The plain stone walls break into a cove from which a rich panelled ceiling projects. The upper screen is formed of plain glass panels set between marble pilasters, broken only by ornamental bronze wickets at the tellers' windows. The same bronze in very much the same design and detail is used for the check desks and benches

or any other part of the architectural treatment. Then, they must be elaborate enough in detail to make them sufficiently conspicuous to be a feature in themselves, as well illustrated in the First National Bank of Jersey City by Mr. Bossom on page 561. Summing up, then, the check desks should conform in line, detail and material (which includes color and texture) with some portion of the screen or walls in order to appear as an actual part of the architectural scheme; or should be in ance and to embody any cordiality. The ceiling offers the natural outlet for such ornament. Its position in a room—out of the direct line of vision, yet always making itself felt by its presence—allows of more than ordinary ornamentation without detracting from the solidity and dignity of the walls. Again, the monumental quality of the wall treatment would be of no value if those walls were not called upon to noticeably support something,—an illusion which a plain ceiling

would never effect. Often an enriched cornice will suffice, or a coffered ceiling, but, in many cases, elaborate painted decoration is required. Here, also, is the opportunity for a unificaton of the colors of the various materials used on the walls, screen, etc., which, up till now, may be

WOODLAWN TRUST & SAVINGS BANK, CHICAGO, ILL.

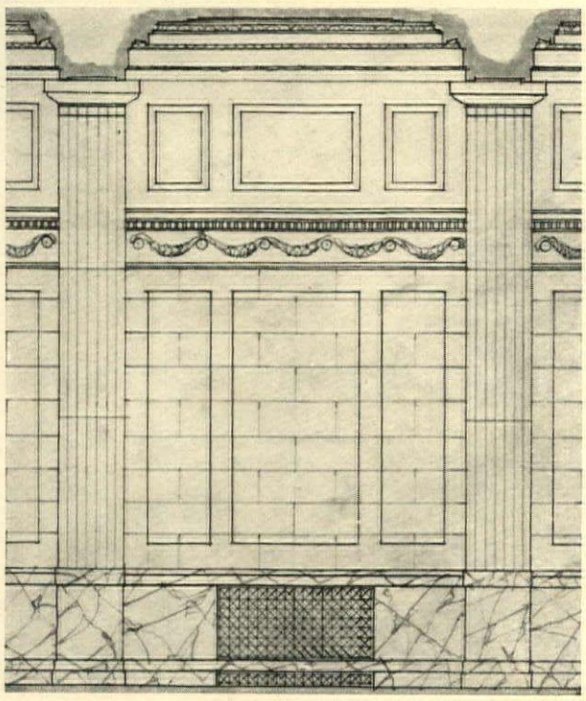
WEARY & ALFORD COMPANY, DESIGNERS

The dignified architectural treatment of the walls is relieved by the coffered ceiling. Notice the refined scale of the check desk

strangely lacking. The high ceiling, so popular today, adds materially to the imposing effect of the whole, and allows a wide range for decoration. It has another advantage, that of supplying space for a mezzanine above the tellers' desks or vault, according to the plan, which can be put to good use as stenographers' offices, directors' rooms, or for other purposes as needed.

The floor of the main banking space must also be designed as a part of the whole scheme. Its qualities of durability are probably of next importance to its decorative properties as related to the architectural scheme, and, from both standpoints, marble or stone is often first choice. Rubber tile, too, has, in addition, a quality of foot comfort and quietness which is sometimes greatly to be desired.

Lighting forms an extremely important problem in a bank interior. Although it is best to design and plan the bank so that natural lighting facilities will properly light its interior under ordinary conditions, sufficient artificial light must be provided for dark days and night. Ceiling lights arranged in clusters serve best to distribute an evenly balanced light throughout, and intensified light, as needed for check desks, etc., can be supplied by desk fixtures. The scale of the wall details alone practically eliminates the use of wall brackets. In designing the lighting fixtures, further to carry out the semblance of unity in the entire scheme, it is desirable to use the same metal as used for the banking screen. When the ceiling fixture hangs from an ornamental ceiling, it can be designed so that it becomes a part of that ornament. Where the building site permits, the natural light should be behind the teller and should shine directly on the face of the customer at the wicket. Unfortunately, this arrangement is not always possible, but the results make it worth striving for. Frequently, where the site rather limits the natural light, skylights can be incorporated into the plan to overcome this disadvantage to a great extent. As seen by the illustration of the Bank of Coney Island, designed by Holmes & Winslow, they have converted a dome ceiling into a huge skylight, with the second floor forming a rotunda from which one looks down on the banking room. Natural lighting facilities are greatly increased and the effect of spaciousness is an added asset.



ELEVATION SHOWING WALL TREATMENT IN THE SURF AVENUE BRANCH OF THE BANK OF CONEY ISLAND, CONEY ISLAND, NEW YORK

HOLMES & WINSLOW, ARCHITECTS

A good combination of marble, stone and plaster. The Greek columns are surmounted by an enriched cornice

The heating and ventilating problem of a bank is only enlarged by a mezzanine, for, with the generally high ceiling, it is not a simple one, anyhow. Properly to distribute the heat so that the mezzanine and lower portion of the room will both be comfortable at the same time is a problem that requires careful study.

BEAUX-ARTS INSTITUTE *of* DESIGN

OFFICIAL NOTIFICATION OF AWARDS

JUDGMENT OF APRIL 8TH, 1924

THE MUNICIPAL ART SOCIETY PRIZE

Through the generosity of the Municipal Art Society of New York City this Prize will be awarded annually on the fourth Class "A" Projet of the season.

FIRST PRIZE—$50.00 SECOND PRIZE—$25.00

CLASS "A"—IV PROJET

"A MUNICIPAL MARKET"

A municipality proposes to erect a public market on a rectangular plot 450'-0" x 300'-0". One long side of the plot faces a river. The river level is 20'-0" below the level of the streets which surround the plot. Five feet (5'-0") above the river will be provided a basement under as much of the plot as is necessary, for storage purposes, it being assumed that most of the supplies arrive in boats.

The market may be one great hall or there may be separate divisions for meat, fish, farm produce, flowers, etc. Exceptionally good light and ventilation are essential. The construction need not cover the entire plot as some selling (as of flowers) may be done out of doors during most of the year. There should be a few small offices, public telephones and toilets, and ample communication to the basement.

In addition to the market there will be, either as a part of the market building or in close connection with it, a restaurant using its produce. This will be patronized by the market people and by the people of the city. It should provide in not more than two stories for the two classes of customers, and should be placed on the river side of the plot.

JURY OF AWARDS:—R. M. Hood, H. O. Milliken, J. H. Freedlander, E. S. Hewitt, B. W. Morris, C. W. Stoughton, F. A. Godley, E. F. Sanford, Jr., D. Barber, H. M. Woolsey, W. VanAlen, Captain Butcher, H. Hornbostel, H. W. Corbett, F. H. Bosworth, Jr., E. R. Bossange, G. A. Licht, F. C. Hirons, H. Sternfeld, O. Faelton, C. Grapin, and G. Fraser.

JURY FOR THE AWARDING OF THE PRIZES:—R. M. Hood, H. O. Milliken, J. H. Freedlander, E. S. Hewitt, C. W. Stoughton, E. F. Sanford, Jr., D. Barber, Captain Butcher, and W. VanAlen.

NUMBER OF DRAWINGS SUBMITTED:—121.

AWARDS:—

FIRST PRIZE—($50.):—T. P. Yang, Univ. of Pennsylvania, Phila.

SECOND PRIZE—($25.):—W. Ferrari, Yale Univ., New Haven.

SECOND MEDAL:—T. M. Prentice and S. M. Shaw, Columbia Univ., N. Y. C.; J. N. Franklin, Carnegie Inst. of Tech., Pitts.; W. R. Amon, Atelier Licht, N. Y. C.; J. Radotinsky, Univ. of Kansas, Lawrence; T. P. Yang, R. Ruhnka and J. L. Evans, Univ. of Pennsylvania, Phila.; W. Ferrari and W. Faulkner, Yale Univ., New Haven.

FIRST MENTION:—C. D. Badgeley, O. W. Wilson, C. L. Cummings, C. L. Douglas, S. R. Moore, G. R. Tyler, A. J. Waldeier, R. Gottlieb, E. C. Morris, A. M. Dick, L. Moore, J. H. Robb, A. E. Klueppelberg, C. Leonardi, J. A. Fernandez, D. D. Streeter, B. Schlanger, Columbia Univ., N. Y. C.; A. Thormin, J. H. Delo, E. M. Gearhart, H. C. Douden, H. A. Page, W. C. Pyle, Carnegie Inst. of Tech., Pitts.; W. H. Speer, Atelier Denver, Denver; P. Simonsen, D. K. Frohwerk, J. Gambaro, Atelier Hirons, N. Y. C.; E. Sheppard, P. Goodman, Atelier Licht, N. Y. C.; J. S. Shanley, F. W. Roudebush, Princeton Univ., Princeton; H. A. King, Syracuse Univ., Syracuse; E. A. Beihl, W. E. Willner, "T" Square Club, Phila.; W. P. Wagner, H. H. Griffith, I. B. Parsons, A. M. Butts, H. Silverman, F. T. King, E. F. Tucker, H. Cunin, V. L. Annis, E. R. Duckering, D. M. Blum, H. C. Wood, Univ. of Pennsylvania, Phila.; E. I. Harrison, E. Mittelbusher, Univ. of Illinois, Urbana; C. F. Ferrari, W. Douglas, D. Douglass, O. Williams, Yale Univ., New Haven.

SECOND MENTION:—A. R. Hauser, V. Viscariello, Armour Inst. of Tech.—Dept. of Archt., Chicago; A. Ehrenrich, J. B. Walther, R. M. Pott, Columbia Univ., N. Y. C.; M. A. Brace, A. D. Reid, Carnegie Inst. of Tech., Pitts.; F. Paulicek, Jr., A. H. Emerick, J. A. Hartell, Cornell Univ., Ithaca; A. S. Phillips, Atelier Denver, Denver; H. Boster, T. Rayburn, Ohio State Univ., Columbus; R. I. Powell, A. P. Davis, Princeton Univ., Princeton; A. F. Eldridge, Syracuse Univ., Syracuse; A. K. Arai, H. B. Hoover, Univ. of Washington, Seattle; D. Kosvich, R. A. Mattson, F. W. Lang, A. B. Gallion, Univ. of Illinois, Urbana; H. P. Staats, Yale Univ., New Haven.

H. C.:—M. G. Maybeck, S. Swales, V. Rambusch, H. Dumper, Columbia Univ., N. Y. C.; R. E. Stiffler, R. L. Linden, Atelier Denver, Denver; E. P. Newbeury, W. B. Glynn, V. N. Jones, Univ. of Washington, Seattle.

CLASS "A"—IV ESQUISSE-ESQUISSE

"AN OFFICE BUILDING LOBBY"

JURY OF AWARDS:—H. O. Milliken, P. A. Cusachs, E. H. Bennett, W. VanAlen, W. H. Beers, Captain Butcher, F. Foster, C. Grapin, and G. Fraser.

NUMBER OF DRAWINGS SUBMITTED:—61.

AWARDS:

SECOND MENTION:—B. Schlanger and S. R. Moore Columbia Univ., N. Y. C.; A. E. Euston, Atelier Hirons, N. Y. C.; P. Goodman, Atelier Licht, N. Y. C.; N. N. Rice, Univ. of Pennsylvania, Phila.; W. Faulkner, D. Douglass, and W. H. Schilling, Yale Univ., New Haven; A. Thormin, Carnegie Inst. of Tech., Pitts.

SPIERING PRIZE COMPETITION

A Prize founded in memory of Louis C. Spiering, from funds bequeathed by him to the Society of Beaux-Arts Architects and given for the best solution of the fourth Class "B" Esquisse-Esquisse of the season.

PRIZE—$50.00

CLASS "B"—IV ESQUISSE-ESQUISSE

"A WAITING PAVILION FOR A TROLLEY LINE"

JURY OF AWARDS:—H. O. Milliken, P. A. Cusachs, E. H. Bennett, W. VanAlen, W. H. Beers, Captain Butcher, F. Foster, C. Grapin, and G. Fraser.

JURY FOR THE AWARDING OF THE PRIZE:—H. O. Milliken, P. A. Cusachs, E. H. Bennett, W. VanAlen, W. H. Beers, and Captain Butcher.

NUMBER OF DRAWINGS SUBMITTED:—102.

AWARDS:—

PRIZE—($50.):—V. Galier, "T" Square Club, Phila.

FIRST MENTION:—V. Galier and J. E. Jackson, "T" Square Club, Phila.; R. B. Bloomgarten, Univ. of Kansas, Lawrence.

SECOND MENTION:—E. J. Mathews, Columbia Univ., N. Y. C.; E. D. Woods, Atelier Cairns, Memphis; T. Locraft, Catholic Univ., Wash., D. C.; C. F. Schwarzwalder, Chicago Atelier, Chicago; J. Tillotson, Carnegie Inst. of Tech., Pitts.; F. J. Schlosser, John Huntington Poly Inst., Cleveland; E. Cacchione and W. R. Harer, "T" Square Club, Phila.; W. P. Cunningham, Univ. of Kansas, Lawrence; W. H. Schilling, P. M. Duncan and S. C. Haight, Yale Univ., New Haven.

CLASS "A" & "B" ARCHAEOLOGY—IV MEASURED DRAWINGS

JURY OF AWARDS:—R. M. Hood, E. S. Hewitt, B. W. Morris, F. A. Godley and F. H. Bosworth, Jr.

NUMBER OF DRAWINGS SUBMITTED:—4.

SUBJECT:—Colonial Doorway Waterbury House at Skaneateles, New York.

AWARD:—SECOND MEDAL:—F. W. Hunt, Syracuse Univ., Syracuse.

SUBJECT:—The Bassett House.

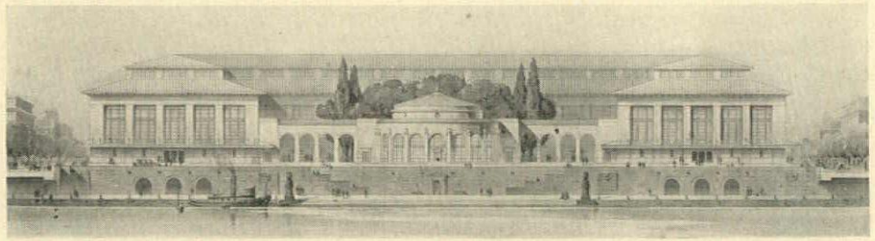
AWARD:—SECOND MEDAL:—H. P. Staats, Yale Univ., New Haven.

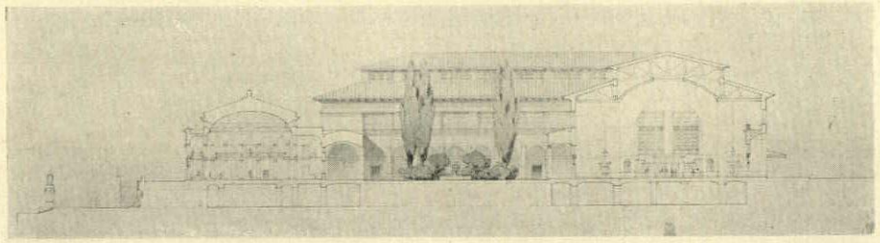
SUBJECT:—Loggia of the Villa Di Papa Givlio 3rd at Rome.

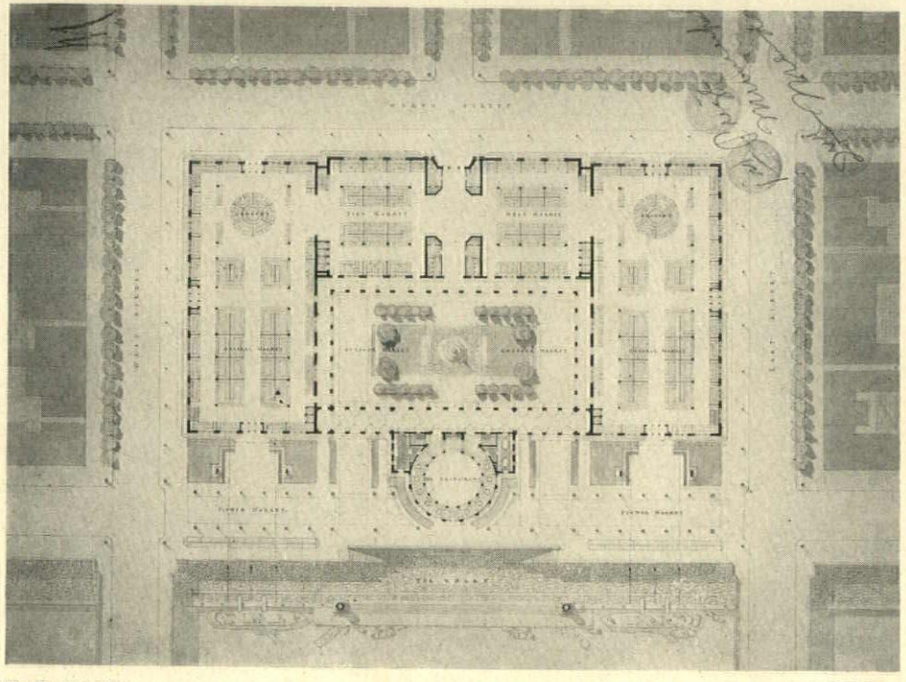
AWARD:—SECOND MEDAL:—W. Faulkner, Yale Univ., New Haven.

SUBJECT:—A Colonial Doorway at Homer, New York.

AWARD:—MENTION:—L. H. Maxon, Syracuse Univ., Syracuse.



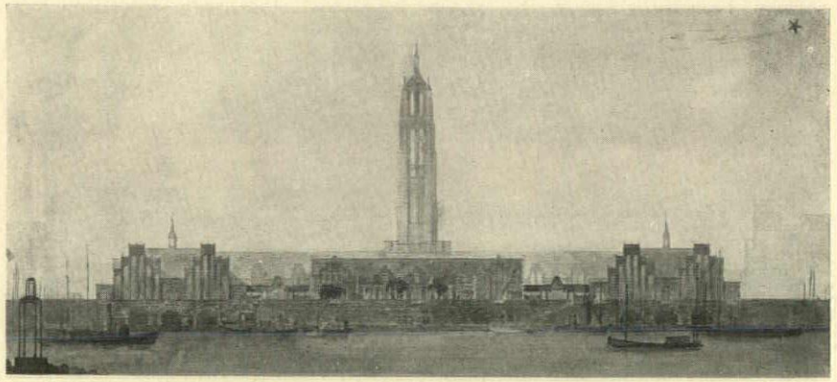


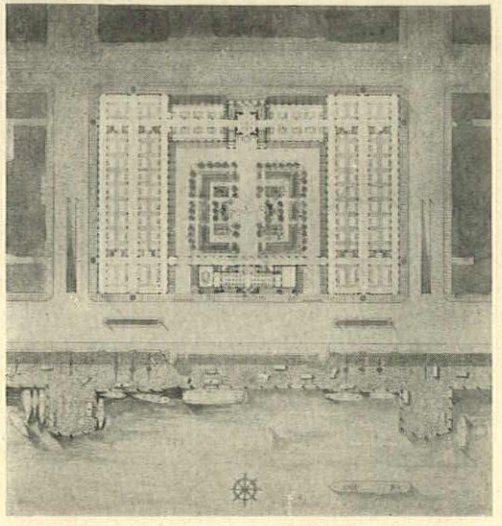


T. P. YANG

UNIV. OF PA.

FIRST PRIZE—SECOND MEDAL





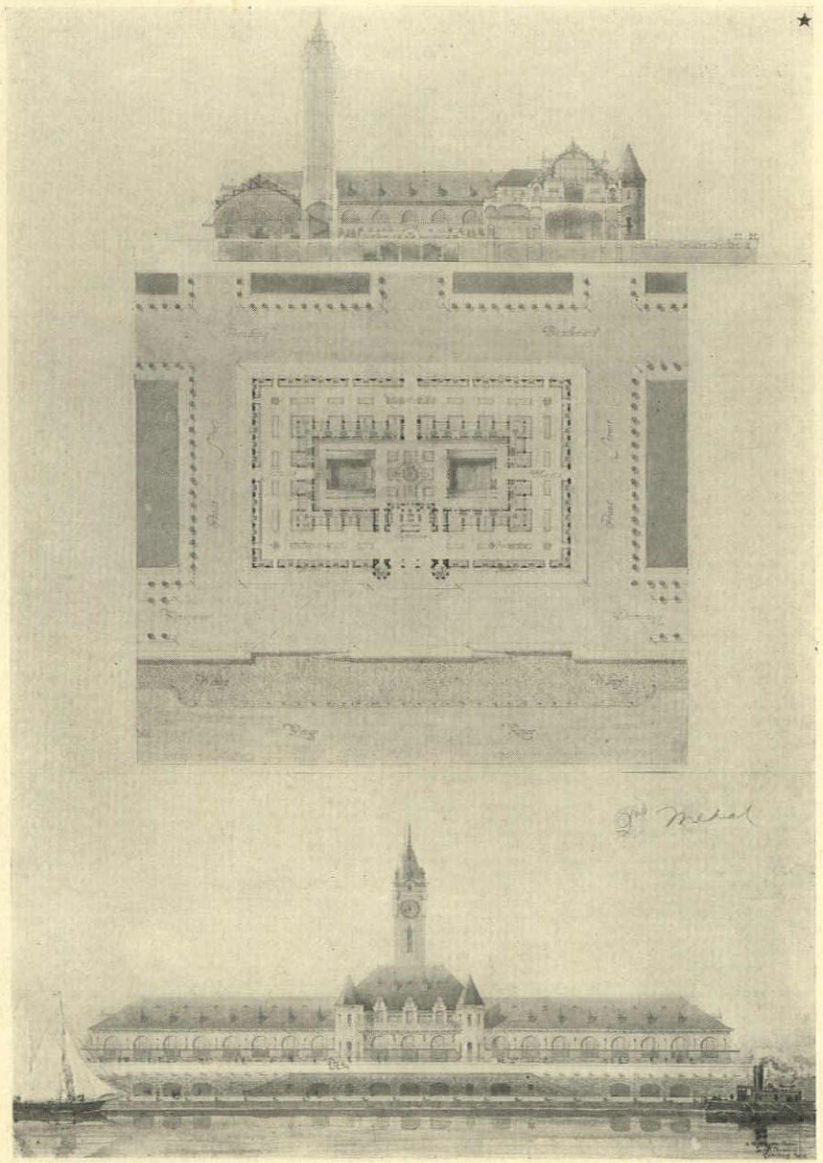
W. FERRARI

YALE UNIV.

SECOND PRIZE—SECOND MEDAL

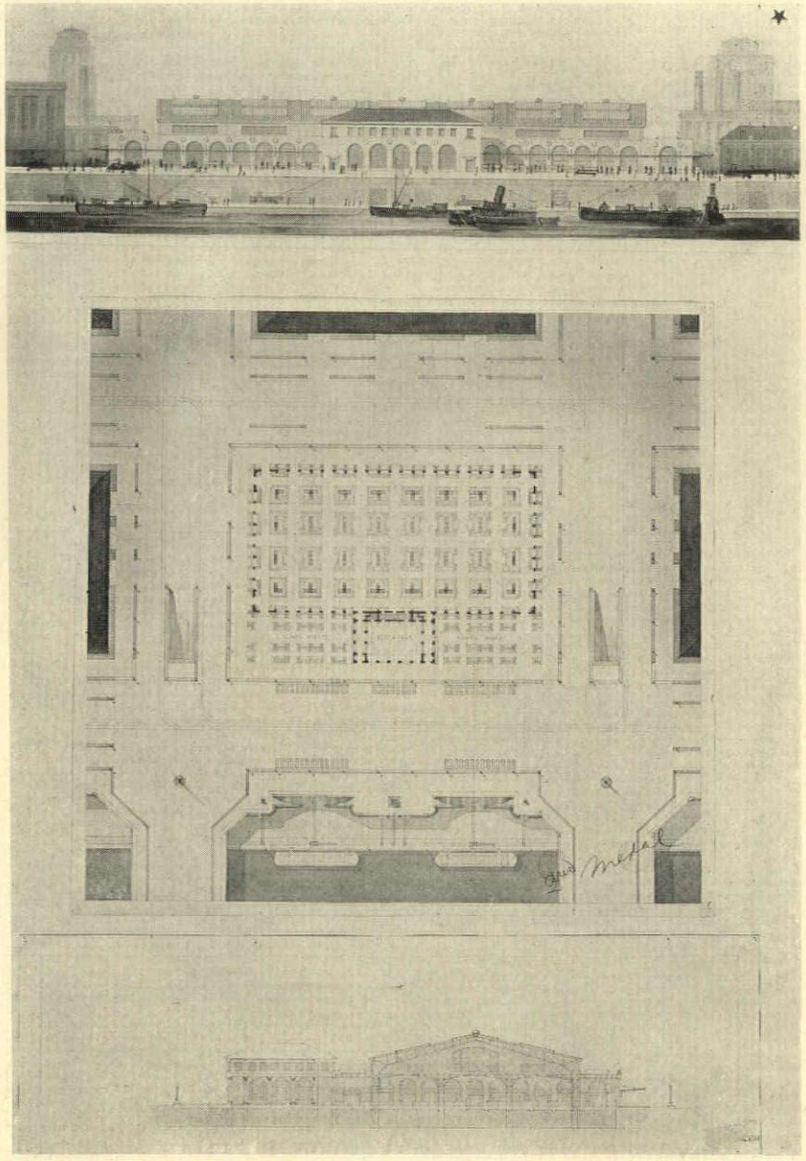
CLASS "A"–IV PROJET—MUNICIPAL ART SOCIETY PRIZE COMPETITION, A MUNICIPAL MARKET

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN



J. N. FRANKLIN — CARNEGIE INST.

SECOND MEDAL

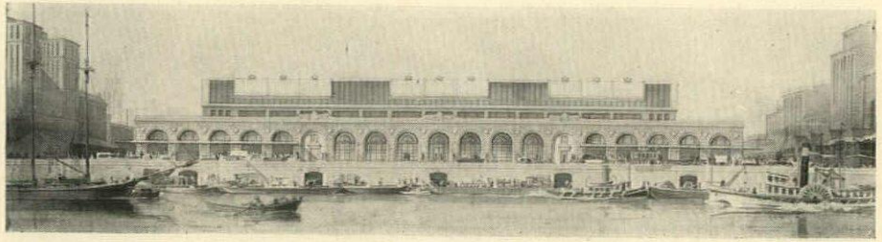


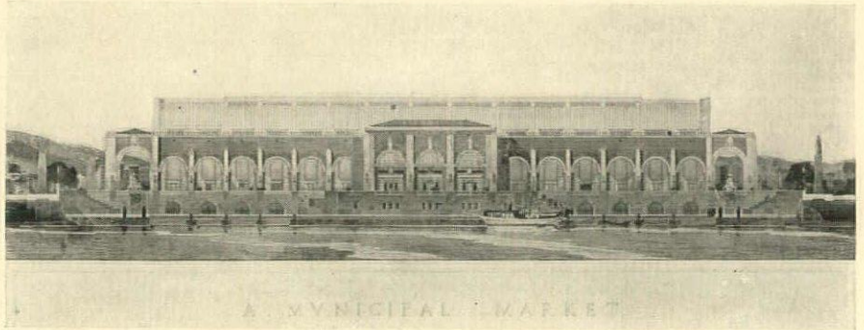
S. M. SHAW — COLUMBIA UNIV.

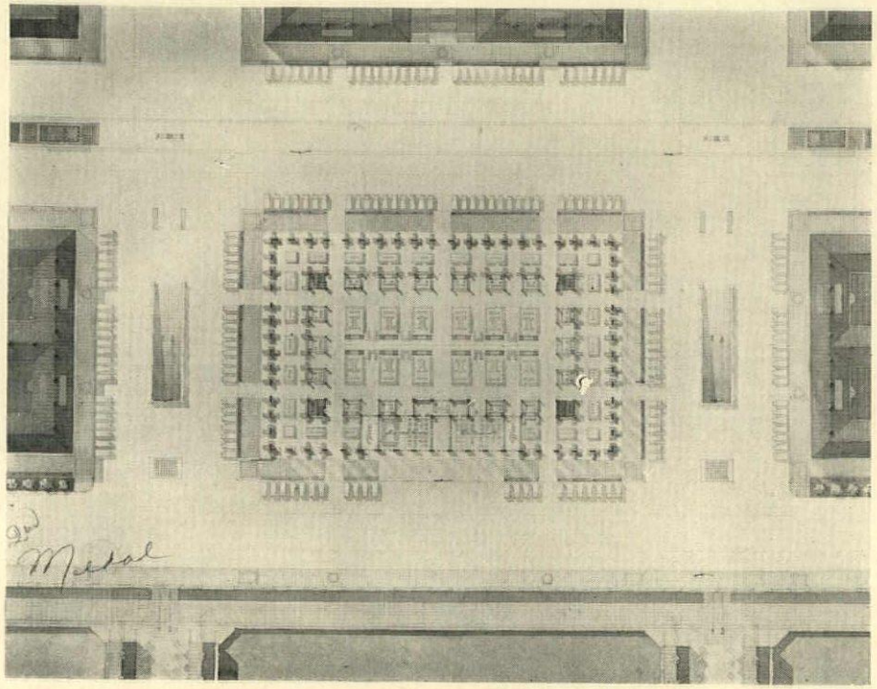
SECOND MEDAL

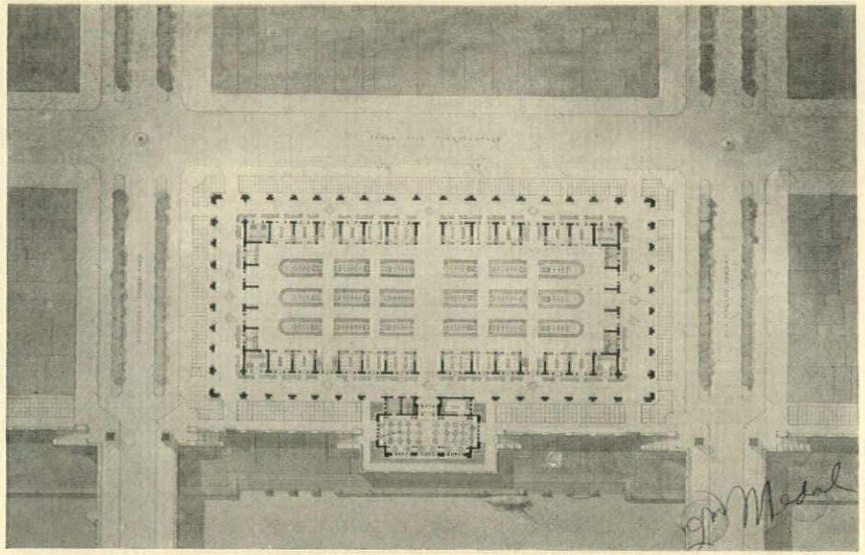
CLASS "A"–IV PROJET—MUNICIPAL ART SOCIETY PRIZE COMPETITION, A MUNICIPAL MARKET

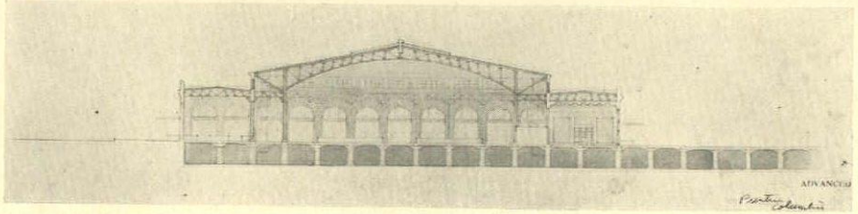
STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN

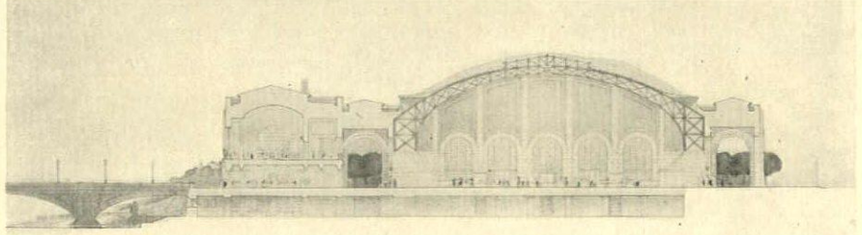












T. M. PRENTICE — COLUMBIA UNIV.

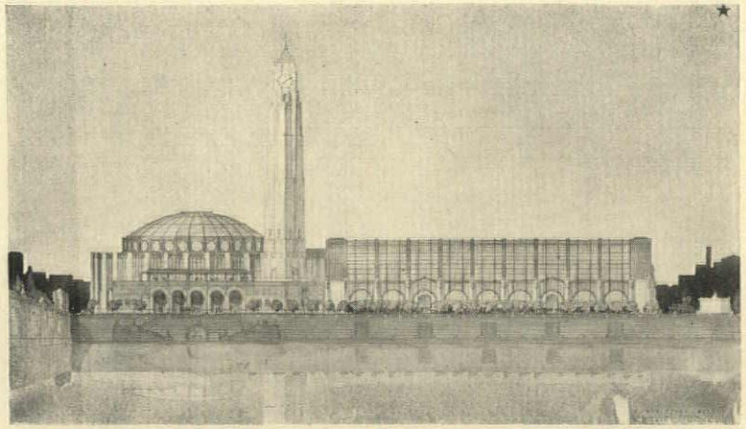
SECOND MEDAL

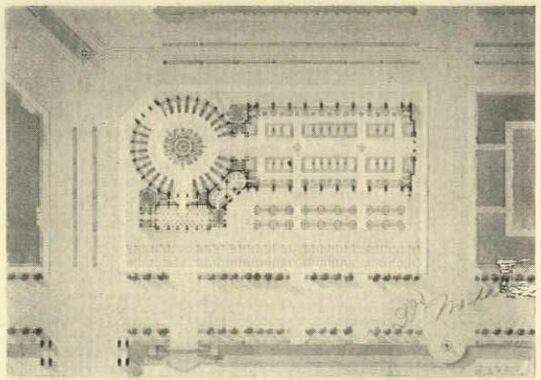
R. RUHNKA — UNIV. OF PA.

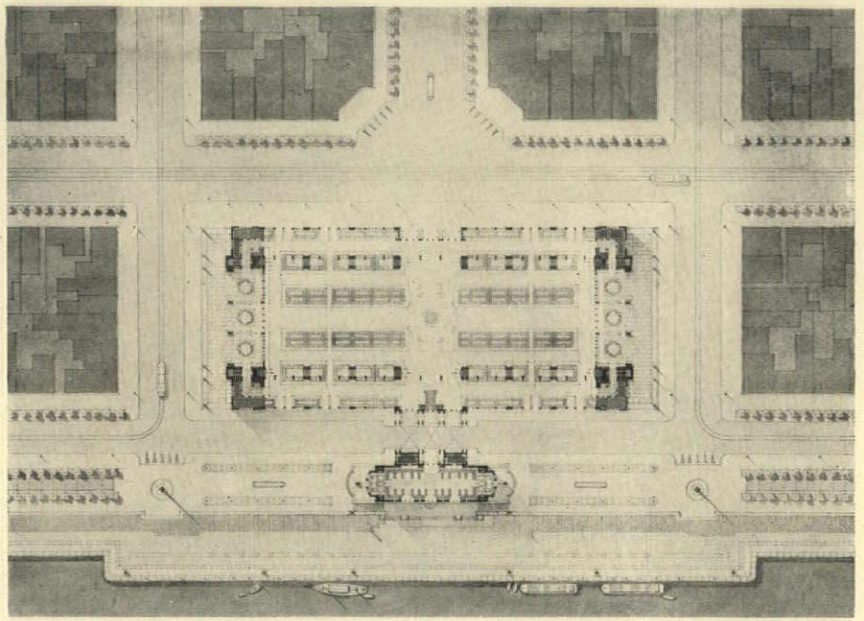
SECOND MEDAL

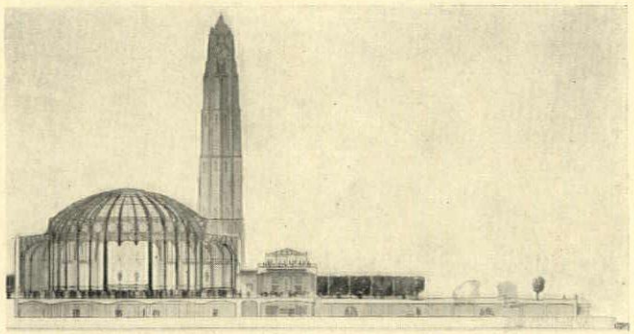
CLASS "A"–IV PROJET—MUNICIPAL ART SOCIETY PRIZE COMPETITION, A MUNICIPAL MARKET

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN



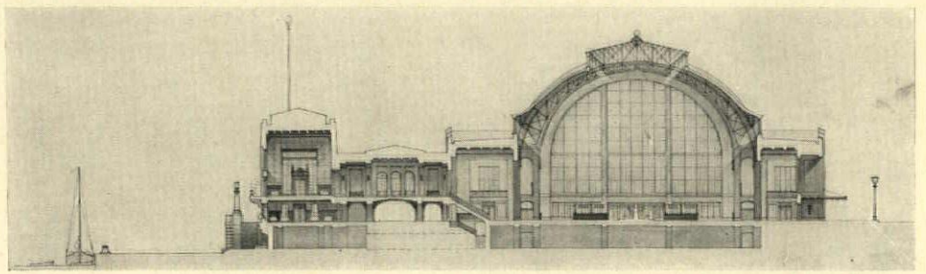






W. R. AMON — ATELIER LICHT

SECOND MEDAL

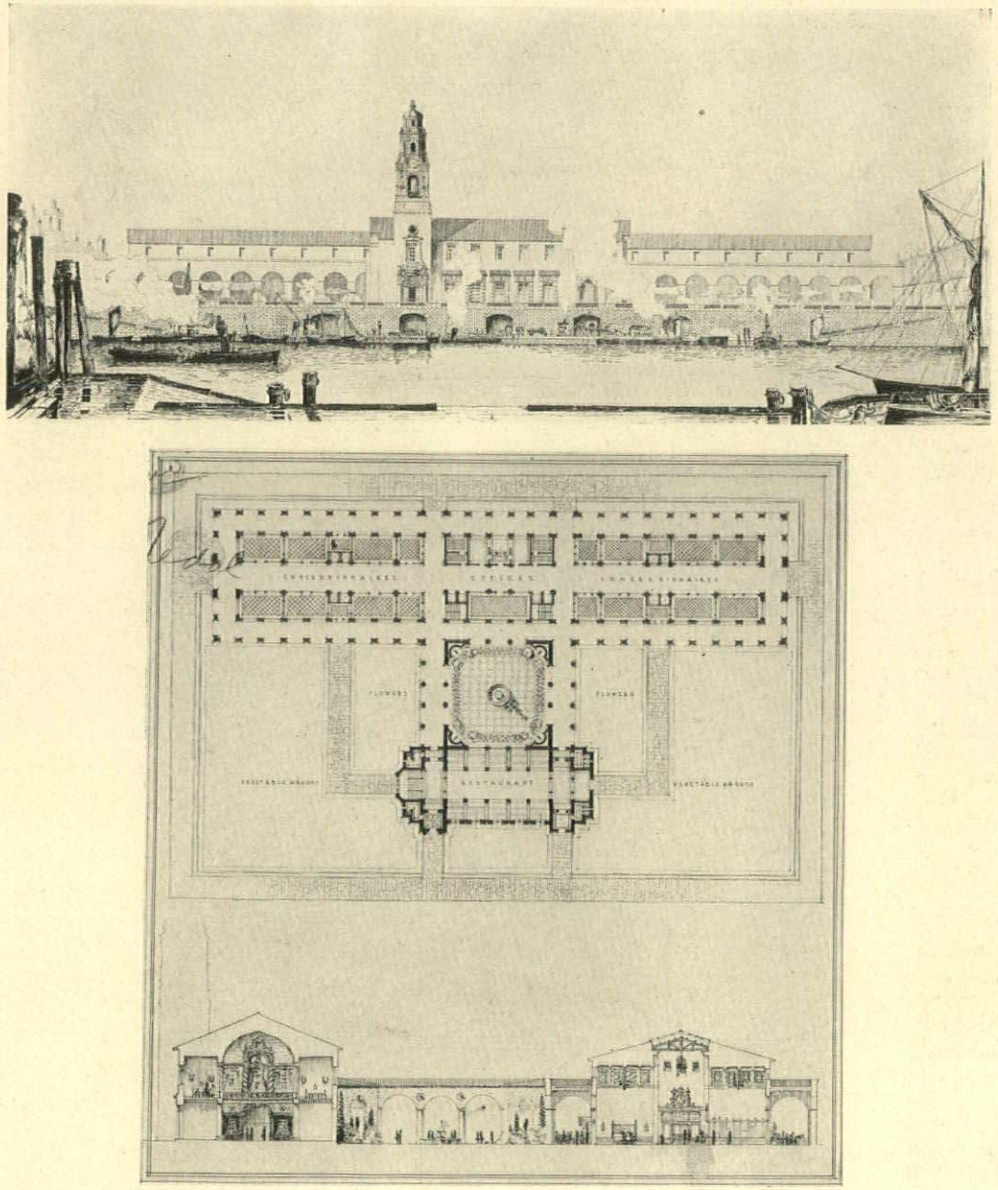


J. L. EVANS — UNIV. OF PA.

SECOND MEDAL

CLASS "A"–IV PROJET—MUNICIPAL ART SOCIETY PRIZE COMPETITION, A MUNICIPAL MARKET

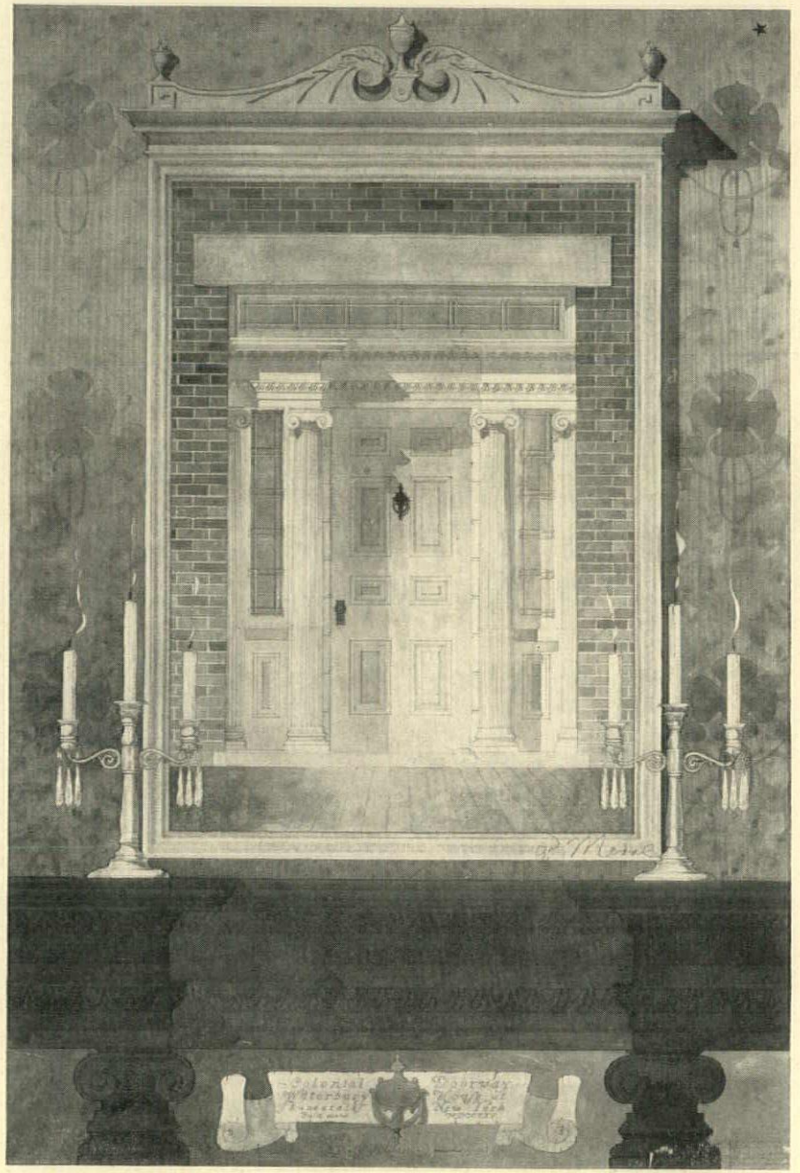
STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN



J. RADOTINSKY — UNIV. OF KANSAS

SECOND MEDAL

CLASS "A"–IV PROJET—MUNICIPAL ART SOCIETY PRIZE COMPETITION,
A MUNICIPAL MARKET



F. W. HUNT — SYRACUSE UNIV.

SECOND MEDAL

CLASS "A" AND "B" ARCHAEOLOGY–IV MEASURED DRAWING
DOORWAY, WATERBURY HOUSE AT SKANEATELES, N. Y.

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN

COST ACCOUNTING FOR ARCHITECTS

BY H. P. VAN ARSDALL, of SAMUEL HANNAFORD & SONS, Architects, Cincinnati, Ohio

In two Parts—Part I

Introduction

ARCHITECTURE primarily is an art; the aesthetic side of building furnishes its reason for existence, but its practice as a business involves all the questions incident to any commercial or manufacturing enterprise.

It necessarily, at the beginning, involves personal service, and for a purely personal service any compensation whatever is profit. Such service is generally rendered by the young practitioner at the beginning of his career. When, however, the natural growth of his practice renders necessary the services of employed assistants, the total fees are no longer profit, but a part is absorbed by salaries, etc., so that with the growth of practice the business aspect becomes more and more marked. With most architects the change from the minor to the major condition comes gradually and, since their time is generally well occupied, the questions of profit and cost of production seem to be unimportant. Consequently cost accounting as applied to the practice of architecture has been given slight consideration even by those whose business relations are most extended.

Cost accountants, probably because they are profoundly ignorant as to the real nature of an architect's business relations, have given no thought to systems adapted to his use. In fact, without a rather intimate knowledge of the work, it would be impossible for them to do so.

The writer has no intention of laying down hard and fast rules on the subject, but after an extended experience with a well organized and successful office, feels that he is qualified to indicate certain practices and methods which he has successfully inaugurated in the office referred to.

It is hoped that the system herein described may prove helpful and suggestive to others facing a similar problem.

For the small office employing a small number of men, an elaborate system is perhaps more of a hindrance than a help but in an office with, say, ten or more, where the volume of work is fairly uniform, a cost system becomes desirable from every point of view.

Description of Work Done by the Architect

THE business an architect has in view after securing his appointment is, *viz.:*

1. Preparation of preliminary studies, sketches, and outline specifications.
2. Preparation of final sketches for owner's approval.
3. Making of working drawings and specifications, including structural and mechanical drawings and specifications.
4. Securing of bids from contractors based upon the drawings and specifications.
5. Awarding of contracts, preparation of the necessary legal documents and the furnishing of the necessary blue prints of drawings and copies of specifications.
6. Superintending of the actual construction work, auditing contractors' estimates, etc.
7. The closing of all contracts and formally turning the completed structure over to the owner.

An architect is not a building contractor; his function is purely professional; he designs the building and supervises its construction, while the actual building is done by the contractor under the architect's directions. The architect selects the kind and grade of materials that enter into the building construction, but the purchasing is done by the contractor. This point is emphasized for the reason that the average layman is under the erroneous impression that the terms "architect" and "contractor" are synonymous.

Charging of Fees

For the services performed, the architect usually receives a fee based upon the cost of the completed structure, this being known as "The Percentage Method."

The American Institute of Architects has issued a document known as "Schedule of Proper Minimum Charges," which states:—for full architectural services, "the minimum charges, based upon the total cost of the work complete, is six per cent." It further states that there are times when "it is proper to make a higher charge than above indicated."

Another method of charging is called "The Fee Plus-Cost Method" wherein the architect receives a stated sum plus his actual cost of producing the drawings and specifications, and supervising the construction.

A third method is sometimes employed and is known as the "Salary Method." Under this arrangement the owner pays all expenses, etc., of the office, and a fixed salary to the architect. This method is rarely used.

The "Percentage Method" is the one most frequently used and is, in the writer's judgment, the most unreasonable. The inadequacy of this method can best be proven by the following ex-

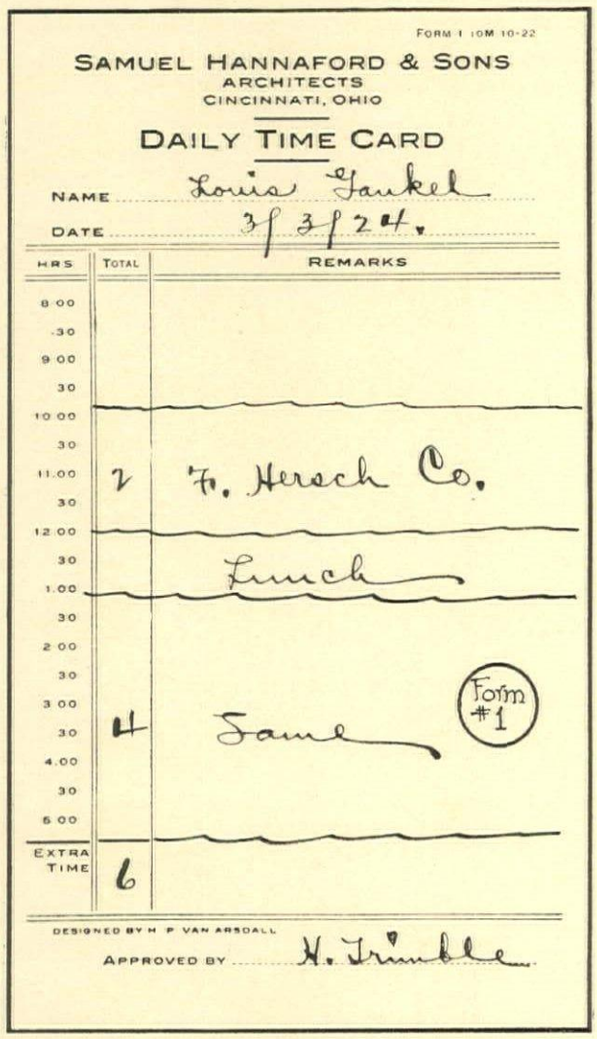
amples, the cost figures of which are taken from a firm's books:—

Fee—6% on a Gothic Church costing $200,000.00	=	$12,000.00
Costs—For plans, specifications, superintending and overhead	=	10,200.00
Net Profit	=	1,800.00
Fee—6% on Two-story Factory costing $200,000.00	=	$12,000.00
Costs—For plans, specifications, superintending and overhead	=	6,200.00
Net Profit	=	5,800.00

From the foregoing examples, would you think it unreasonable to say that architects are badly in need of a cost system and a different method of charging fees? They are not only unfair to themselves when the "Percentage Method" is used, but grossly unjust to the public. You can readily see from the illustration that where the greatest skill is employed, *viz.*, in the designing of a church building, their profit is very small, and in a purely engineering problem where a small amount of artistic ability is required, as in the case of a factory building, the profit is 200 per cent more. The reverse should be true. The writer is not attempting to change the architect's method of charging fees, but the error in his system is so obvious that the opportunity to express an opinion on it cannot be passed.

Frequently drawings and specifications are prepared for a building and before they are entirely completed the client for some reason abandons the entire project. Usually the client does not feel obligated to pay a reasonable fee for the service rendered, stating that since he is not going to build, the plans are of no value to him. This state of affairs places the architect in a very embarassing position, as he has nothing to show the client in proof of his claim but fifteen or twenty drawings in an unfinished state, which to the layman mean little or nothing. The thought and study necessary in producing a set of drawings and specifications is something intangible and is utterly inconceivable by the average client. It is difficult for any one who is not familiar with an architect's work to imagine the great amount of time required in developing an artistic exterior or in the planning of a better arrangement. The client can only see a finished drawing represented by a few lines and figures on a piece of white paper.

When a condition such as mentioned above arises, the architect often becomes involved in a long discussion with his client relative to his fee, with the result that the client ultimately wins and the architect retires with a sum less than actual cost. The writer has made many sad settlements and feels fully experienced in matters of this kind. In the years 1914-1915 this situation arose frequently, due to the abandonment of building on account of the World War, causing numbers of firms to lose thousands of dollars. Quick and satisfactory settlements could have been made in most cases if the architects had been armed with a "cost sheet" showing the exact number of hours, drafting costs, engineering and overhead expense.



FORM 1 10M 10-22

SAMUEL HANNAFORD & SONS
ARCHITECTS
CINCINNATI, OHIO

DAILY TIME CARD

NAME Louis Jaukel

DATE 3/3/24.

HRS	TOTAL	REMARKS
8 00		
30		
9 00		
30		
10 00		
30		
11.00	2	F. Hersch Co.
30		
12 00		
30		Lunch
1.00		
30		
2 00		
30		
3 00		Form #1
30	4	Same
4.00		
30		
5 00		
EXTRA TIME	6	

DESIGNED BY H. P. VAN ARSDALL

APPROVED BY H. Trimble

FORM NO. 1

Architects should realize that they must have some sort of a cost system and a method of measuring profits on different classes of work.

The value of keeping costs may be summarized as follows:

1. Exact knowledge for the business manager in order that he may be perfectly familiar with what work is the most profitable for the office.
2. To determine profits accurately.
3. To be able to make a just settlement with a client when a job is abandoned.
4. Accuracy in making income tax returns.

5. Quickness in preparing financial statements.
6. The fact that a cost system is kept usually speeds up the drafting room.
7. The satisfaction of knowing what it costs to produce a certain piece of work.

There are four elements composing cost of production, namely:—drafting, engineering, superintending, overhead.

DRAFTING—Includes the preliminary work of the designer in making sketches, estimates, water color drawings, etc.; all time of draftsmen in producing plans, elevations, sections, details, etc.; the time spent by the specification writer in producing the specifications. (If more refinement is wanted in your cost records, specification writing may be separated from drafting.)

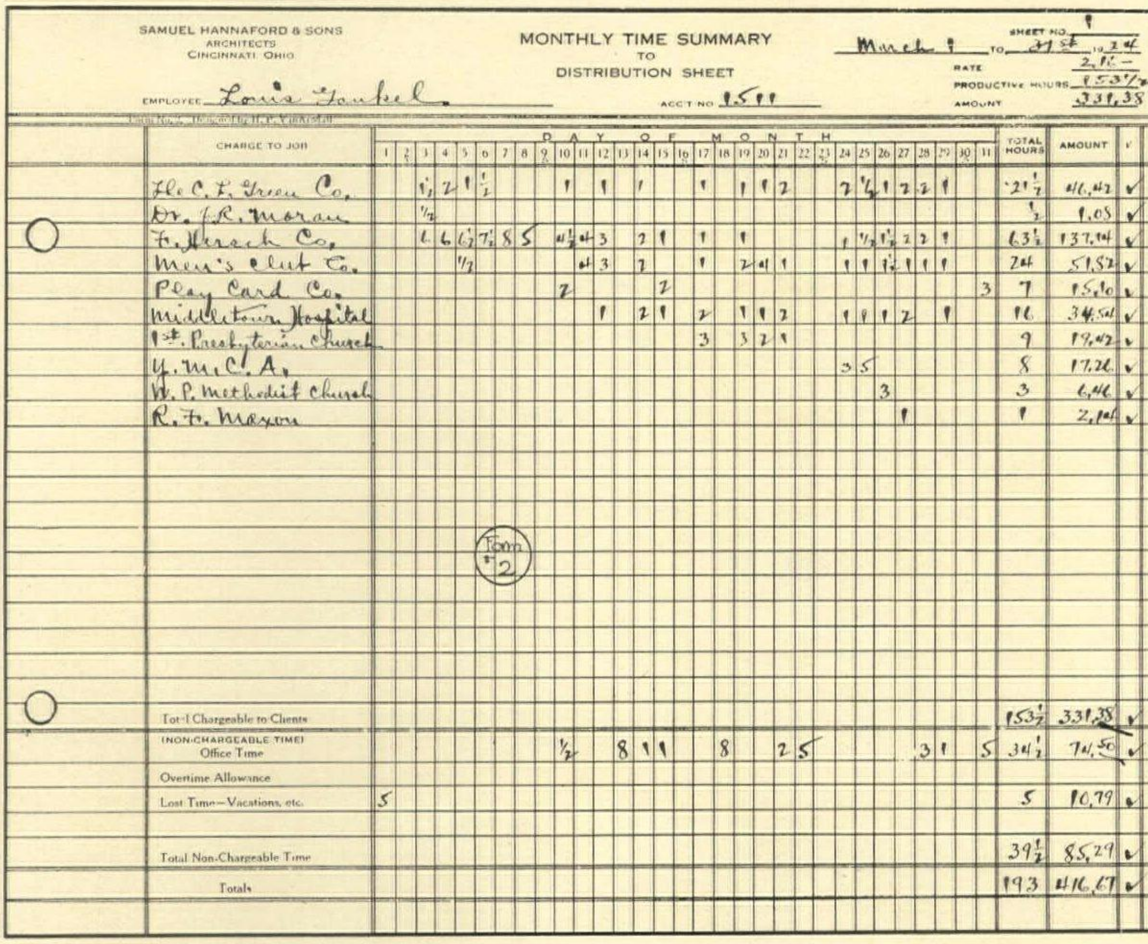
ENGINEERING—Includes all time in the engineering department in producing drawings and specifications for reinforced concrete, structural steel, electric, plumbing, heating, and power work.

SUPERINTENDING—Includes the time of the general superintendent and the inspectors engaged on the various buildings under construction.

OVERHEAD—Includes all items of expense which are not directly chargeable to a particular job or order, such as rent, heat, light, etc.

The collecting of the first three cost items is comparatively simple as every man turns in a time card, one for each job, showing the exact time spent on an engagement. Time is not kept closer than half-hour divisions since a man usually works from one to thirty days on a single job. It has been found that a smaller division is unnecessary. When a man completes a drawing, a certain amount of time is lost before he is ready to start on another job. When this occurs it is presumed that he will devote the non-producing period to study or the cleaning up of his drawing instruments, desk, etc. This non-productive time is charged as an overhead expense. When the monthly time sheets show a large amount of non-productive time the business manager knows immediately that the chief draftsman is not allotting the work in the drafting room to the best advantage. The percentage of non-productive time should never run over ten per cent. No doubt this seems large but an architect's office cannot be run as a factory, due to the peculiar nature of the work, and the impossibility of keeping every man engaged at all times.

The Cost System is planned so as to distribute



SAMUEL HANNAFORD & SONS
ARCHITECTS
CINCINNATI OHIO

MONTHLY TIME SUMMARY
TO
DISTRIBUTION SHEET

March 1 TO 31st 1924
SHEET NO. 1
RATE 2.16
PRODUCTIVE HOURS 153½
AMOUNT 331.38

EMPLOYEE Louis Gaukel
ACC'T NO. 1511

CHARGE TO JOB	TOTAL HOURS	AMOUNT	✓
The C. F. Green Co.	21½	46.42	✓
Dr. J. R. Moran	½	1.05	✓
F. Hersch Co.	63½	137.14	✓
Men's Club Co.	24	51.52	✓
Play Card Co.	7	15.10	✓
Middletown Hospital	16	34.50	✓
1st. Presbyterian Church	9	19.42	✓
Y. M. C. A.	8	17.26	✓
W. P. Methodist Church	3	6.46	✓
R. F. Mason	1	2.16	✓
Total Chargeable to Clients	153½	331.38	✓
(NON-CHARGEABLE TIME) Office Time	34½	74.50	✓
Overtime Allowance			
Lost Time—Vacations, etc.	5	10.79	✓
Total Non-Chargeable Time	39½	85.29	✓
Totals	193	416.67	✓

Form 2

FORM NO. 2—MONTHLY TIME SUMMARY

Samuel Hannaford & Sons, Architects.
Cincinnati, Ohio.

Form #3.

Time Distribution

for

Month of March 192 4

Sheet No. 3
Entered in Journal
Fol. 116
Line. 1

Account or Job Name.	Employee's Name (Shown by Account Number in black below). Amounts. L.C. 1511	H.E.H. 1512	J.N.H. 1513	R.O. 1514	C.R.C. 1515	H.O.M. 1516	K.M.T. 1518	C.L. 1519	W.P.B. 1520	C.W.F. 1521	H.O.S. 1531	M.M.O. 1531	Totals Debited to Work in Process: Drafting	Engineering	Superintending	Total Debit Non-Assignable Time	Total Debit
The C.F. Green Co.	46 02		20 00		65 77				110 00	173 34	50 00		465 53	50 00			465 53
Dr. J.R. Moran	1 08		15 33						1 69			17 32	21 08		17 32		38 40
Fredk. Herrick Co.	137 10	81 33	24 44		110 23	85 21	336 70	116 50	153 50	9 44		12 06	953 67		12 06		965 73
Men's Club Co.	51 37					209 03		7 00					263 25				263 25
Play Card Co.	15 10												15 10				15 10
Middleton Hospital	34 50	178 00	34 00					85 00	3 33				285 31				285 31
1st. Presbyterian Church	19 02												19 02				19 02
Y.M.C.A.	17 26												17 26				17 26
W.P. Methodist Church	6 46												6 46				6 46
R.F. Mason	2 04												2 04				2 04
F.J. Rook		13 33											13 33				13 33
Washington Bank						1 04	7 34					51 55	3 76		51 55		55 39
Church of the Redeemer												21 77			21 77		21 77
R.S. Jackson												55 11			55 11		55 11
American Cotton Oil												9 32			9 32		9 32
Office Time	74 56	38 67	9 45	59 73					23 33		8 89					214 57	214 57
Lost Time, Vacation	10 79	17 34	2 78	1 56	44 44	7 32		5 00	8 33	32 23		4 47				94 10	94 10
Totals Credited to Individual Salary Acc'ts.	416 67	278 67	109 44	61 29	180 44	303 30	239 30	208 50	299 16	215 00	58 89	171 55	2016 31	50 00	167 13	308 67	2542 11

Man-Hours & Distribution of Overhead Expense.

for

Month of March 192 4

Productive Hours 1868
Non-Prod. " 376½
Total Hours 2244½

Total Man-Hours 1868
Rate .91¼+
Total Overhead 1707.00

Debit Jobs with Overhead.	Man-Hours.												Total Man-hours	× Rate	= Total Overhead
The C.F. Green Co.	21½		36		74				66	156	45		398½	× 91¼+ exacte	363 08
Dr. J.R. Moran	½		33						1			19½	54		49 21
Fredk. Herrick Co.	63½	61	44		174	59	206	116½	91½	8½		13½	787½		717 50
Men's Club Co.	24					145		2					171		155 50
Play Card Co.	7												7		6 39
Middleton Hospital	16	96	62					85	2				261		237 80
1st. Presby. Church	9												9		8 21
Y.M.C.A.	8												8		7 29
W.P. Methodist Church	3			Rome									3		2 73
R.F. Mason	1												1		91
F.J. Rook		10											10		9 12
Washington Bank						1	1					58	61		55 58
Church of the Redeemer												24½	24½		22 32
R.S. Jackson												62	62		56 49
American Cotton Oil												10½	10½		9 52
Totals →	153½	167	175	—	198	205	208	203½	160½	164½	45	188	1868	× 91¼+	
Credit Undistributed Account with Total Overhead.															1707 00

Form 3

H.H. Vanarsdell, 12-10-1919.

FORM NO. 3—TIME AND OVERHEAD DISTRIBUTION SHEET

overhead expense on the "Man Hour Plan." Under this scheme no account is taken of the difference in rate of wages. It is assumed that every employee in a general way requires the same amount of supervision, light, heat, space, drinking water, toilet facilities, etc.

The system described uses the following account classification, *viz.:*

1. ASSETS
   - 11. Fixed Assets
     - 111. Office Furniture and Fixtures
     - 112. Books
     - 113. Automobiles
     - 114.
     - 115.
   - 12. Current Assets
     - 121. Imprest Fund
     - 122. Cash in Bank
     - 123. Accounts Receivable
     - 124. Sundry Debtors
     - 125. Investment (Bonds)
     - 126. Materials and supplies on hand
       - 1261. Printing and Stationery Materials
       - 1262. Drawing Materials
     - 127.
     - 128.
     - 129.
   - 13. Prepaid Accounts
     - 131. Prepaid Insurance
     - 132. Advances
     - 133.
   - 14. Working
     - 141. Work in Process
     - 142.
     - 143.
   - 15. Expenses
     - 151. Drafting Room Salaries (To be Distributed)
     - 152. Engineering Salaries (To be Distributed)
     - 153. Superintendents' Salaries (To be Distributed)
     - 154. Undistributed Expense (Overhead to be Distributed)
       - 1541. Non-chargeable time of Principal
       - 1542. Non-chargeable time of Draftsmen
       - 1543. Non-chargeable time of Engineers
       - 1544. Non-chargeable time of Superintendents
       - 1545. Overtime allowance
       - 1546. Lost time, vacations, etc.
       - 1547. Office Salaries (Controlling)
       - 1548. Rent
       - 1549. Printing and Stationery
       - 1550. Drawing Materials
       - 1551. Telephone and Telegraph
       - 1552. Membership and Dues
       - 1553. Donations
       - 1554. Light
       - 1555. Insurance
       - 1556. Traveling
       - 1557. Periodicals
       - 1558. Legal and Accounting
       - 1559. Taxes
       - 1560. Depreciation of Equipment
       - 1561. Bad Debts
       - 1562. Miscellaneous Office
       - 1563. Variations in Undistributed Expense
       - 1564. Automobile Expense
2. LIABILITIES
   - 21. Fixed Liabilities
   - 22. Current Liabilities
     - 221. Accounts Payable
     - 222. Notes Payable (Loans)
     - 223. Salaries Payable
     - 224. Sundry Creditors
     - 225. Variations in Undistributed Expense
     - 226. Allowance for Depreciation (Furniture & Fixtures and Books)
     - 227. Allowance for Bad Debts
     - 228. Accrued Expenses
     - 229. Allowance for Lost Time, Vacations, Etc.
     - 230. Allowance for Depreciation—Automobiles
3. PROPRIETARY INTEREST
   - 31. Capital Investment
   - 32. Surplus
   - 33. Profit and Loss
4. OPERATION PROFIT AND LOSS
   - 41. Cost of Completed Work
   - 42. Fees
5. INCIDENTAL PROFIT AND LOSS
   - 51. Incidental Income
   - 52. Incidental Expense
     - 521. Interest
     - 522.

(*To be Continued*)

PROFESSOR SAARINEN SAILS TO FINLAND

PROFESSOR ELIEL SAARINEN, who has been in the United States for the past year or more, sailed on June 7 for Finland. His address during the Summer months will be Boback, Finland. He will return to this country in October as he has been retained to develop two important projects in or near Detroit.

COMPETITION

THE Polish National Alliance proposes an architectural competition for a new office and headquarters building to be located in Chicago. The professional adviser is R. C. Llewellyn, A.I.A., and the program of the competition, we are advised, is approved by the Committee on Competitions of The American Institute of Architects, Chicago Chapter. Preliminary announcement of the program and other information may be secured by addressing the Polish National Alliance, 1406-8 West Division Street, Chicago, Ill.

NEW YORK SOCIETY OF ARCHITECTS

THE annual meeting and dinner of the New York Society of Architects were held at the Hotel Astor on the evening of Tuesday, May 20, 1924.

The following officers were elected for the ensuing year:—

James Riely Gordon	President
Adam E. Fischer	1st Vice President
Edward W. Loth	2nd Vice President
Henry Holder	Treasurer
Walter H. Volckening	Financial Secretary
Arland W. Johnson	Secretary

The guest speaker of the evening was L. C. Hart, Assistant General Sales Manager for Johns-Manville. Mr. Hart addressed the Society on the subject of "Salesmanship as a Profession." He gave a logical outline of the development of the selling factor in business and commerce, from the prehistoric origin of barter down to the present time; modern salesmanship now receiving its just recognition as one of the respected and dignified professions. Mr. Hart illustrated his lecture by specific references to barter, trade and commerce in ancient, Biblical and modern history and by examples of psychological salesmanship in the works of William Shakespeare. He concluded with an appeal to the architects to give more serious consideration to the salesmen calling at their offices, particularly to those men equipped to give service and furnish technical and informative data.

PERSONALS

Bagg & Newkirk, architects, have moved their offices to 255 Genesee Street, Utica, N. Y.

F. P. Platt & Bro., architects, have moved their offices from 680 Fifth Avenue to 221 West Fifty-seventh Street, New York City.

Peter H. Petersen, architect, has moved his office from 722 Caswell Block to the Bartlett Building, 130 Grand Avenue, Milwaukee, Wis.

Wesley M. Bachman, architect, has established an office at 890 Arcade Building, St. Louis, Mo., where he would be pleased to have manufacturers' catalogs for his files.

Herbst & Kuenzli, architects, are now occupying new offices in the Bartlett Building, 130 Grand Avenue, Milwaukee, Wis., having moved from 722 Caswell Block.

John Sloan, architect, announces that T. Markoe Robertson has been admitted to partnership under the firm name of Sloan & Robertson, with offices at 1 Pershing Square, New York City.

The Illinois Society of Architects announces the removal of its executive offices to Suite 735, Burnham Building, 160 North LaSalle Street, Chicago, Ill.

The architectural firm of Wood & Bradney has been dissolved. J. J. W. Bradney will continue the practice of his profession at 547 Franklin Street, Buffalo, N. Y.

Bernard H. Prack, architect and industrial engineer, formerly located at 801-4 Keystone Building, has moved to 408 Martin Building, North Side, Pittsburgh, Pa.

Gibb & Waltz, architects, announce the removal of their offices, formerly in the Ithaca Trust Company Building, to Suite 16 M on the first mezzanine of the new Ithaca Savings Bank Building, Ithaca, N. Y.

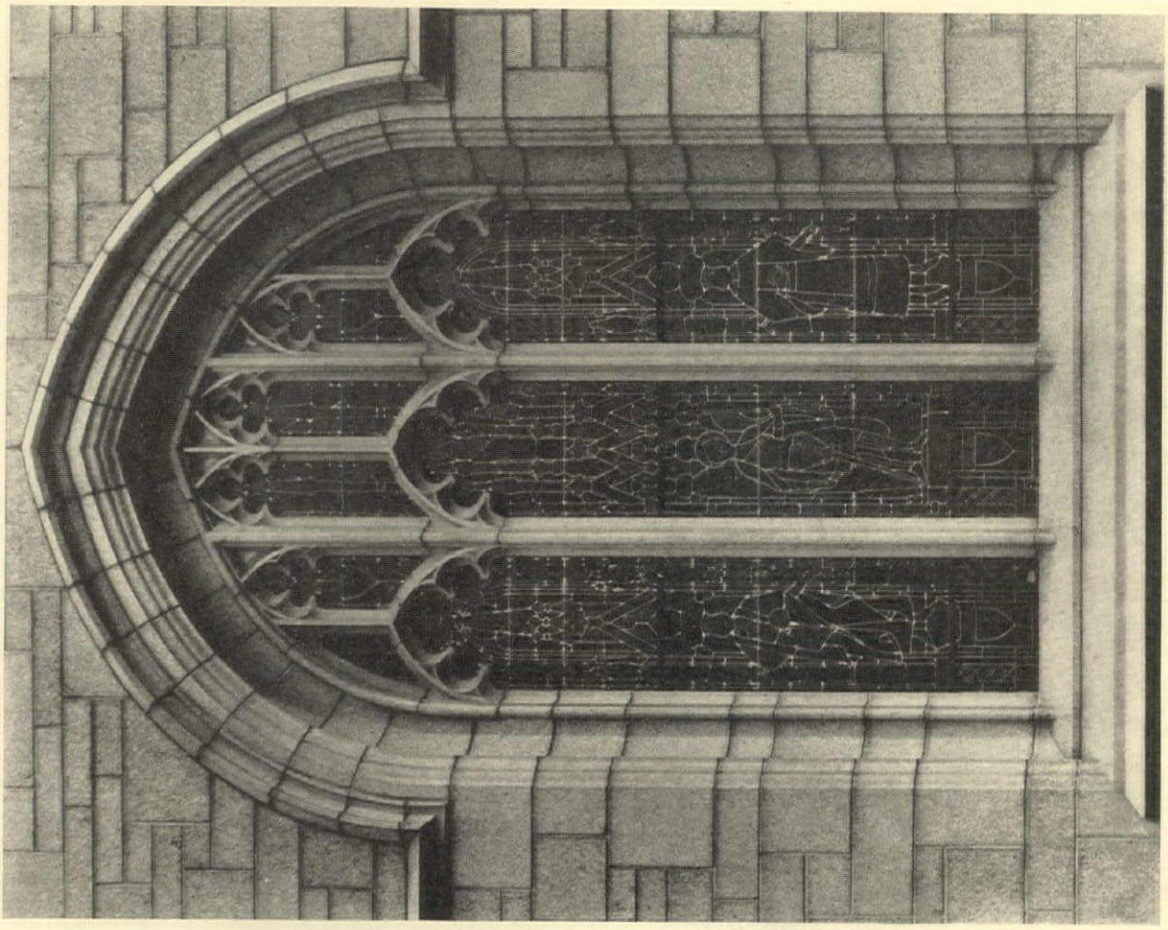
Samuel Marvin Smith, architect, has opened an office for the practice of architecture at 401 Lennox Building, 1523 L Street Northwest, Washington, D. C., where he would appreciate receiving manufacturers' catalogs and samples.

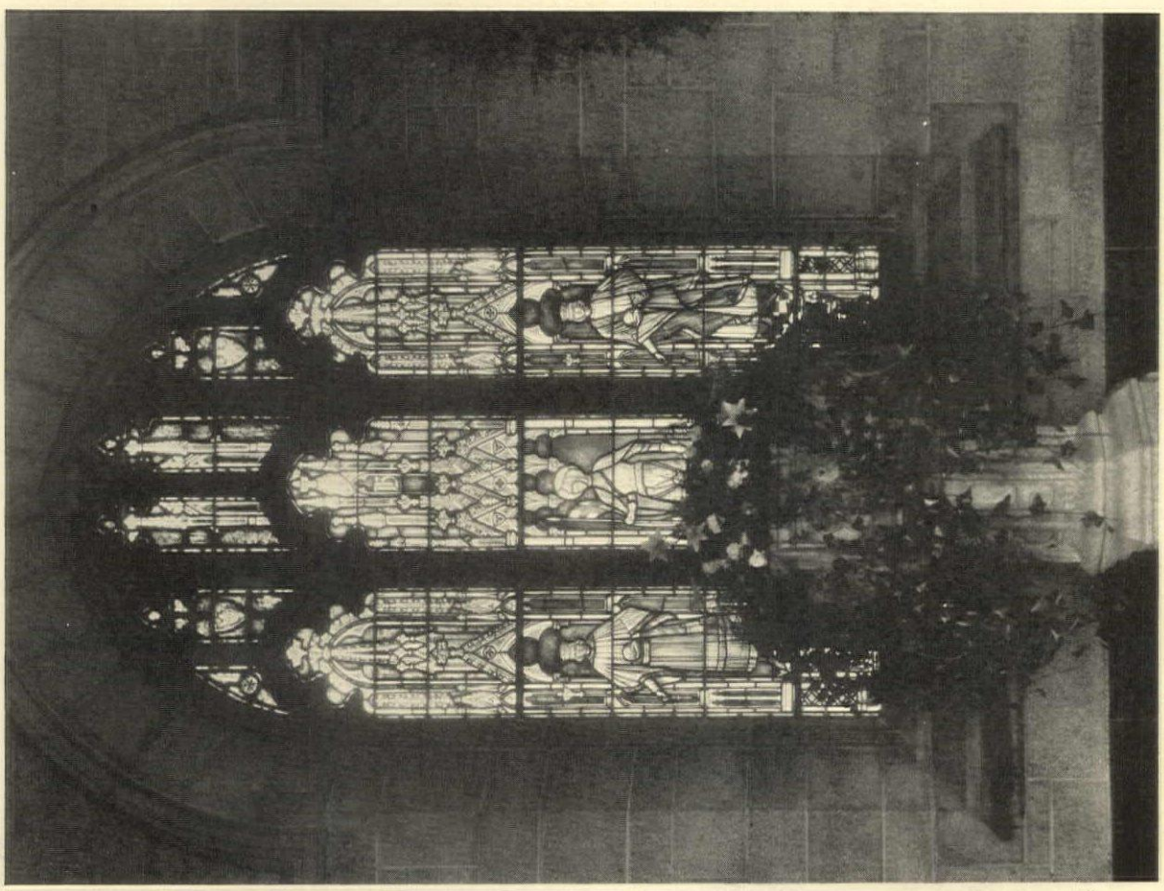
E. W. Sippel, architect, announces the opening of his office for the general practice of architecture at 800 National Bank of Commerce Building, Tulsa, Okla., where he would be pleased to have manufacturers' catalogs and samples.

BUSCH MEMORIAL CHAPEL, ST. LOUIS, MO.

T. P. BARNETT COMPANY, ARCHITECTS

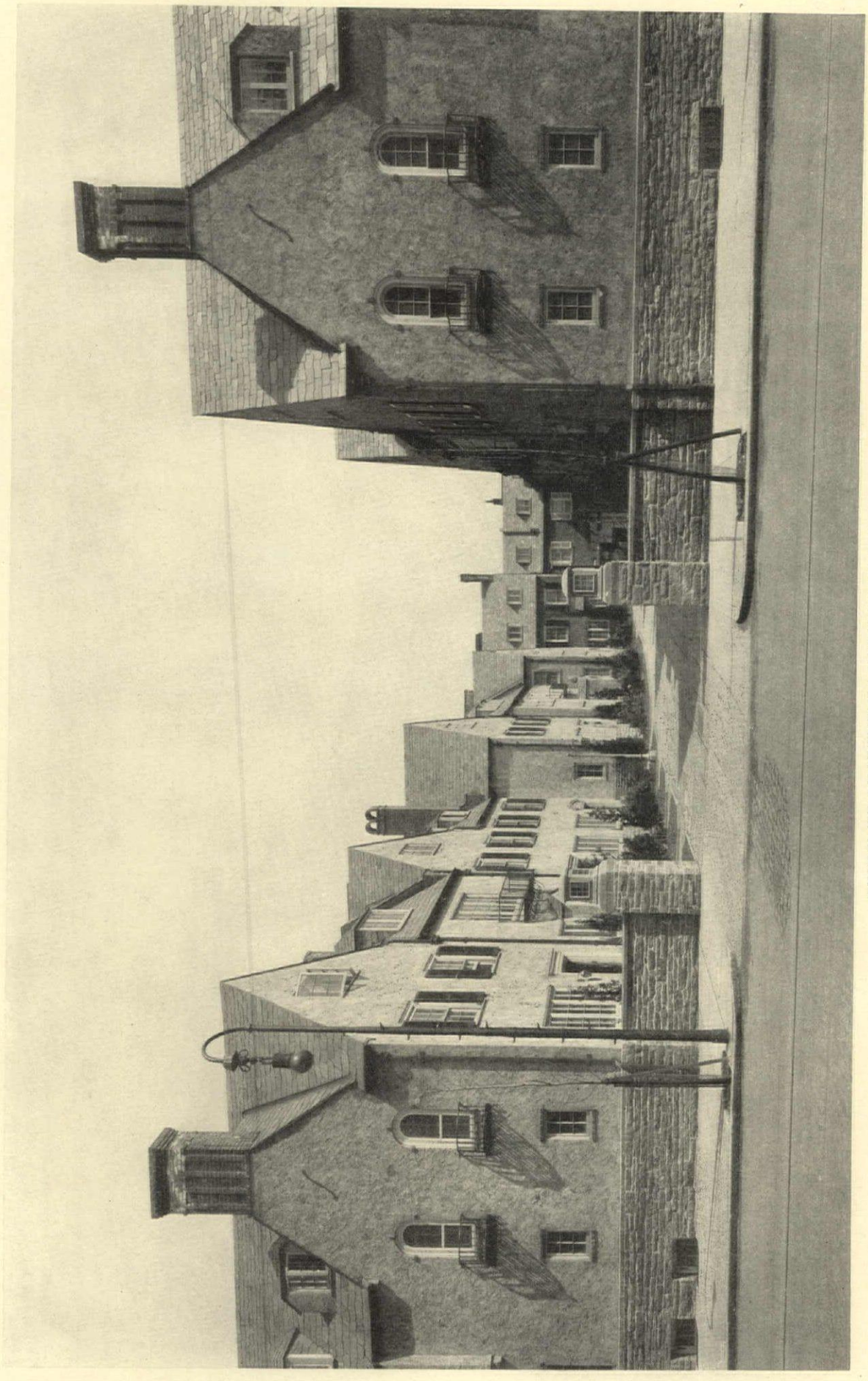
The fleche and gates are entirely of bronze. This structure cost $250,000



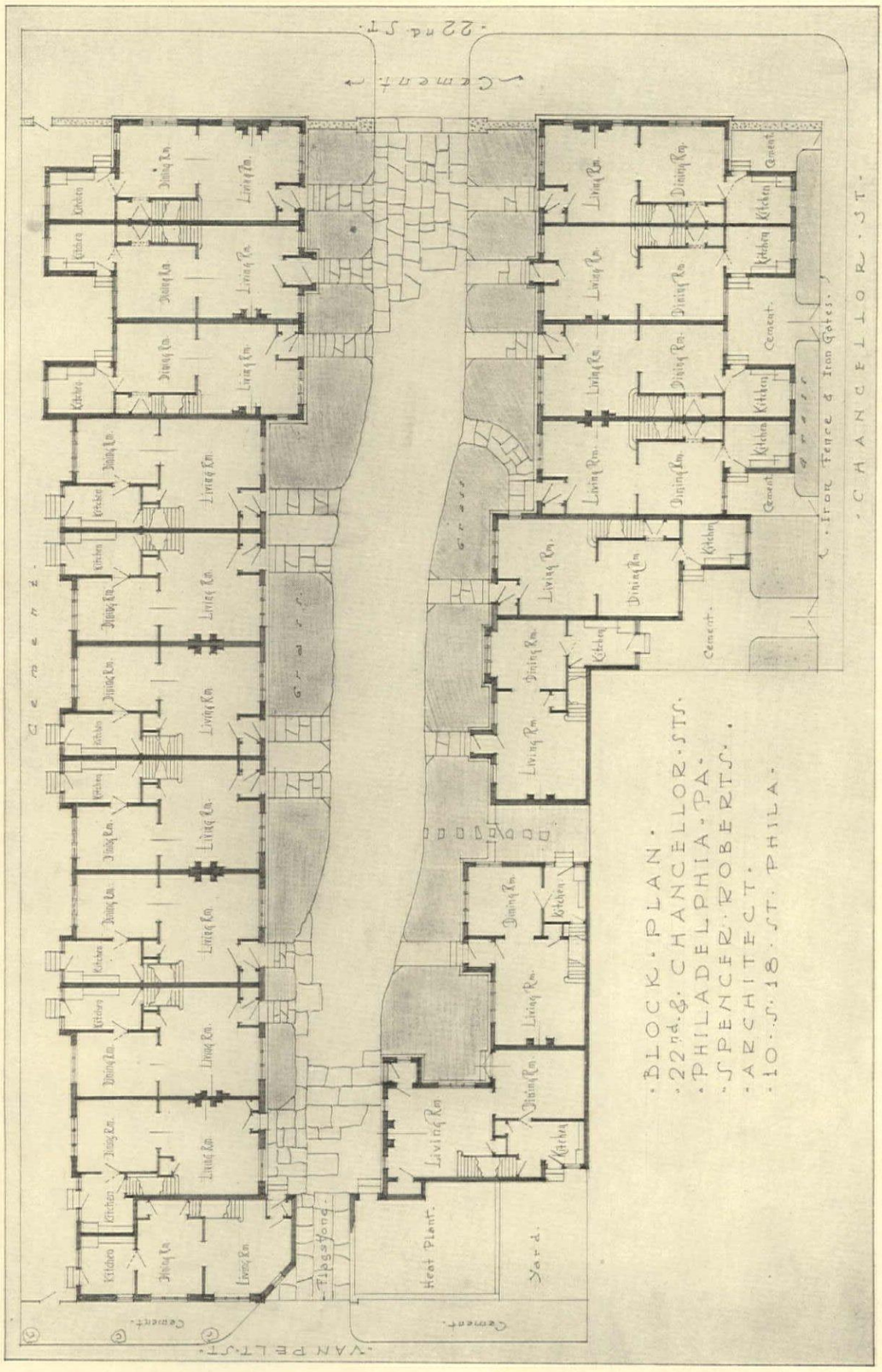


BUSCH MEMORIAL CHAPEL, ST. LOUIS, MO.

T. P. BARNETT COMPANY, ARCHITECTS



GROUP OF APARTMENTS IN PHILADELPHIA, PA.
SPENCER ROBERTS, ARCHITECT



GROUP OF APARTMENTS IN PHILADELPHIA, PA.

SPENCER ROBERTS, ARCHITECT

DETAIL OF A GROUP OF APARTMENTS IN PHILADELPHIA, PA.

SPENCER ROBERTS, ARCHITECT

DETAIL OF A GROUP OF APARTMENTS IN PHILADELPHIA, PA.

SPENCER ROBERTS, ARCHITECT

INTERIOR VIEWS OF A GROUP OF APARTMENTS IN PHILADELPHIA, PA.

SPENCER ROBERTS, ARCHITECT

ARCHITECTURAL ENGINEERING

ACOUSTICS *in* AUDITORIUM DESIGN

BY PAUL E. SABINE, *Riverbank Laboratories, Geneva, Ill.*

THE very definition of the term auditorium implies that acoustic considerations should enter into the designer's plans for a room intended for audience purposes. On the question of acoustics in design, the architect may take one of two extreme positions. He may either ignore the matter altogether in the drawing of his plans, leaving the problem to be solved, if at all, by surface absorptive treatment, or he may give acoustic considerations first place. The first course may produce an acoustical "horror," the second may yield an architectural monstrosity.

In the large majority of cases, however, the situation is not a true dilemma with the traditional number of horns. Speaking generally, rooms are acoustically good, not so much because they possess positive virtues, but because they lack actual defects. The designer's problem, then, so far as acoustics is concerned, becomes largely a matter of what to avoid. The present paper aims to point out in as practical a way as possible, these acoustical "thou shalt nots." Particular problems may call for particular solutions obtained only from detailed study, but there are some general considerations which the designer of any audience room may well hold in mind.

Acoustical difficulties may be classed under two general heads: those arising from the concentration of sound reflected from extended concave surfaces and those arising from excessive reverberation.

As an illustration of the phenomena produced by reflections from curved shapes, the results of a detailed study of the stage of a concert hall, made some three years ago, may be presented. What adverse criticism of the room there is comes from the musicians who occupy the stage rather than from the audience. The best musical test characterizes the room as "brilliant" rather than "dull." This means that if there is any defect in the matter of reverberation, it is on the side of too much rather than too little reverberation. However, computations based on actual measurements of the reverberation time in the empty room show that with a capacity audience this is not excessive, for a room designed primarily for music. My own personal observation of music heard in various positions in the hall leads to the opinion that the conditions do not justify adverse criticism on this score. For speech, the room is not ideal, which is to be expected in view of the primary requirement as a concert hall.

The testimony of the musicians who occupy the stage, however, calls for careful consideration. The director of the orchestra states that he finds considerable difficulty in securing a satisfactory balance of his instruments as heard at the conductor's desk, and that musical effects as heard in this position are quite different from the same effects heard at points in the audience. The organist says that at his bench at one side and a few feet above the stage floor, he frequently finds it hard to hear certain instruments at all. A violinist in the front row speaks of the sound from certain other instruments as "apparently rolling down on his head from the stage ceiling." All of these observations, when considered in connection with the shape of the stage recess, suggested a careful study of this shape from the point of view of its effect upon the sound which it reflects.† Accordingly a large number of photographs of sound pulses reflected from model shapes approximating those of the actual stage were made. Only a few of these will be presented, and these only with a view to the development of a method by which a similar problem can be worked out on the drafting table in advance of actual construction.

Figure 1*a* shows the reflection from the main curvature of the rear wall, the source being located at the center of the black disc in a position corresponding to the middle of the first row of musicians. It happens that this point falls very nearly half way between the curved surface and the center of curvature. It is to be noted that under this particular condition, the front of the reflected pulse is almost plane. As will appear later, the shape of the reflected wave front will depend upon the curvature of the reflecting surface and the position of the source of sound relative to the center or axis of curvature. In 1*b* the

†*The reader is referred in this connection to the predictions made by Professor Wallace Sabine as to the acoustic effects to be expected from the so-called Kuppel-Horizont or "sky dome" on the stage of certain German theatres.* (THE AMERICAN ARCHITECT, *November 22, 1922, reprinted in Collected Papers on Acoustics.*) *In view of the unqualified endorsement of this device by Roi L. Morin in his articles on "Theatre Stage Design" in* THE AMERICAN ARCHITECT, *it is worth questioning whether the "strange and beautiful lighting effects" may not be more than offset by the strange but not beautiful acoustic effects of which it is capable.*

reflection from the more sharply curved sides of the stage is shown. Here the part of the pulse reflected from the sides is seen advancing as from a real source located in the neighborhood of the points F. Using the language of optics, the sharply curved side walls have produced "real

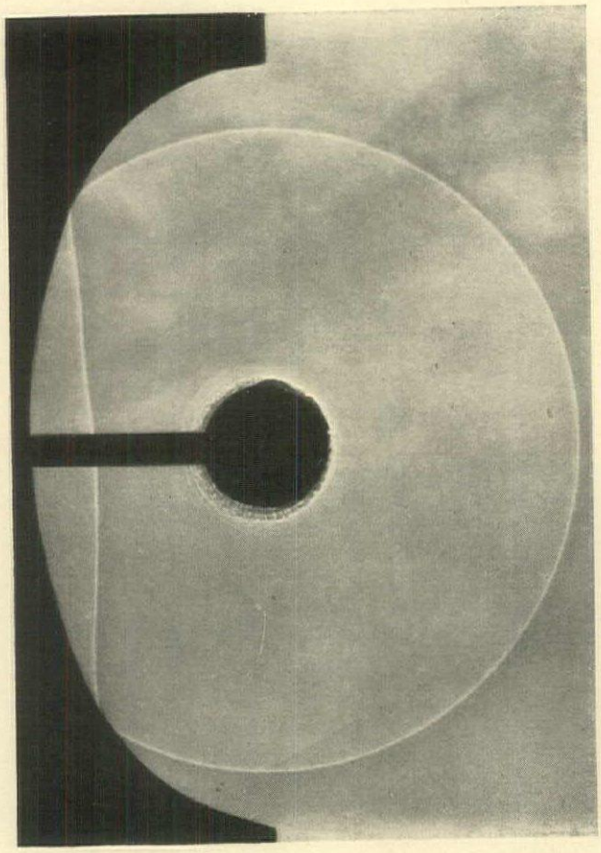


FIG. 1a. SOUND PHOTOGRAPH SHOWING REFLECTION FROM MAIN PORTION OF REAR STAGE WALL

images" of the source of sound at the points F. In Figure 2, the source of sound was located nearer the rear wall. Now the reflected portion of the pulse reflected from the main curvature has a convex front, while the concentrations produced by the sides still appear.

Before interpreting these results, it will be useful to follow the reflected wave a step at a time. We shall borrow the well known optical method of the Dutch astronomer and physicist, Huyghens, widely used in designing lens and mirror surfaces. Reference is made to Figure 3. The source of the sound is located at S. The pulse is propagated as a spherical shell of condensation, whose projection on the plane of the drawing is shown. Assume that the pulse has just arrived at points of the wall which are farthest from the source, namely A and C. Then if the wall were not present, the entire projection of the pulse would be the arc ABC. But those portions of the direct wave which have already reached the wall will have been turned back.

Thus, for example, the projection of that element of the sound wave which struck the reflecting wall at P_1 will, at the instant in question, be in front of the wall at a distance equal to the distance from the wall to the arc ABC. With P_1 as a center, a circle is described tangent to ABC. That portion of the reflected wave which struck the wall at P_1 will lie on the circumference of this circle. Similarly, that portion of the wave which struck at P_2 will lie on a circumference whose center is P_2 and which is tangent to ABC. Proceeding in this way for all points of the wall, we have a series of circumferences. The curve which is tangent to all these circumferences will, according to the Huyghens principle, represent the front of the reflected wave shown at $AB'C$. For this particular position of the source of sound, as has been noted, the front of the wave reflected from the main curvature of the rear wall is practically plane. From the more sharply curved portions at the sides, the front of the reflected pulse is concave, and the reflected sound is seen

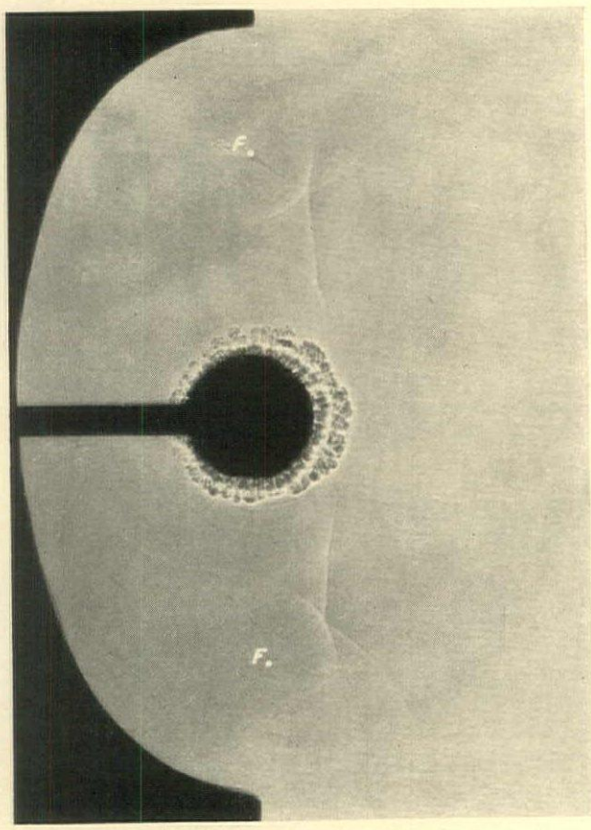


FIG. 1b. PHOTOGRAPH SHOWING CONCENTRATION OF SOUND REFLECTED BY THE SHARPLY CURVED SIDE WALL OF STAGE

advancing to real foci indicated at F on the drawing. These foci act as sources of sound having a definite phase relation to the original sound source, a fact which exaggerates the inequality of distribution of intensity over the stage as pointed out in the article referred to above.

If the source of sound be located at a point less than half the radius of curvature, a similar construction to the foregoing shows that the portion reflected from the main curvature will be convex, while that from the sides will still be concave and the condition will be that photographed in Figure 2. On the other hand, sounds originating in the audience or on the stage, and reflected back to it from the walls and ceilings will be focussed by the rear wall and concentrated in the neighborhood of the point *S* close to the position of the conductor's desk on the actual stage.

Comparisons of the Huyghens construction with the photographs showing the actual reflections indicate how this construction may be employed as a graphical means of studying the reflections of sound from a contour without recourse to sound photography. The method has the advantage of taking into account diffraction effects, which in certain cases, may have a most

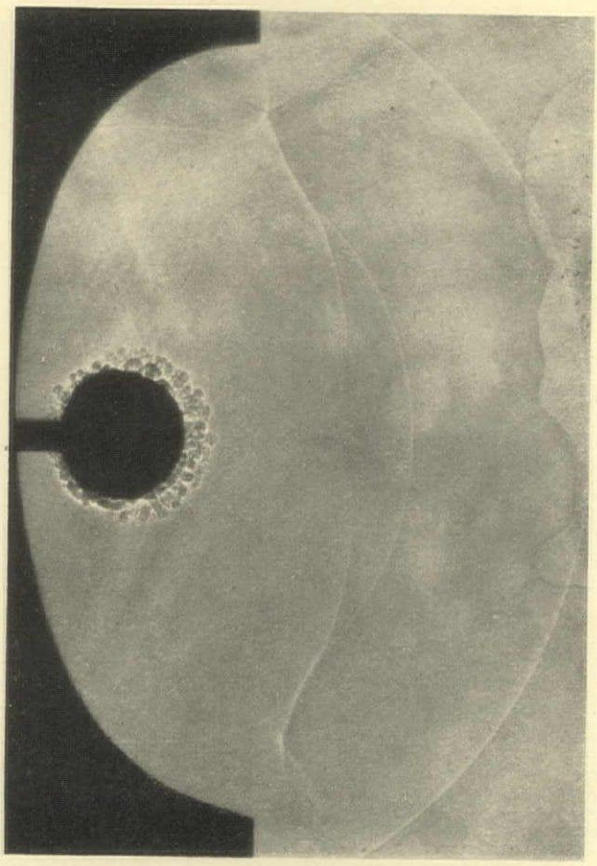


FIG. 2. THE SAME AS FIGS. 1a AND 1b WITH THE SOURCE OF SOUND NEAR THE REAR WALL OF STAGE

important bearing upon acoustic conditions within a room. A striking example is shown in the study of the New Theatre (Century, New York) in the article by Professor Sabine cited above.

In Figure 4, the reflection from the mid-section of stage ceiling is shown, and here again, the focussing action of the reflecting surface is evident. The reflected wave is seen advancing with a concave front which will concentrate it in the front seats of the audience, where reinforcement by such reflection is worse than useless. The more sharply curved portions at the sides will bring a region of concentration upon the stage itself, thus accounting for the phenomenon, as reported by the

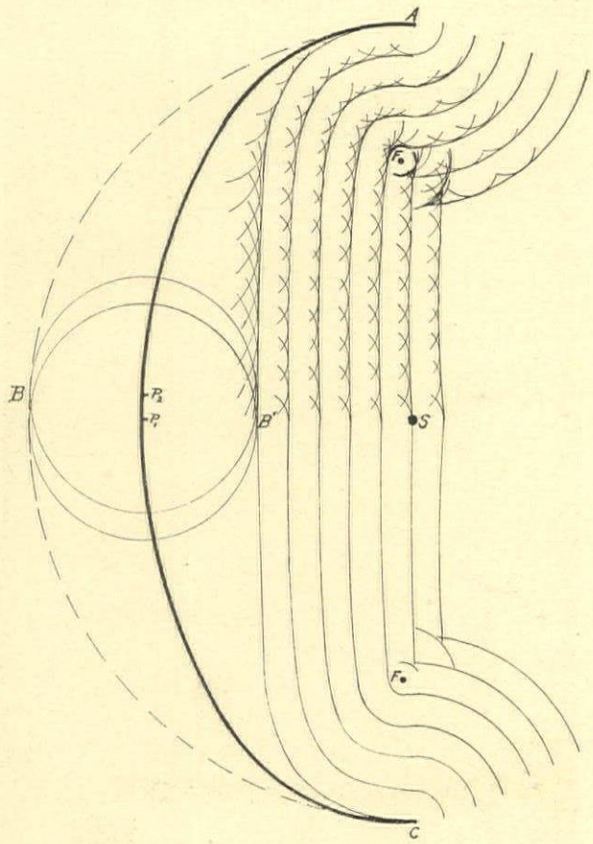


FIG. 3. REFLECTION OF SOUND FROM STAGE WALL PHOTOGRAPHED IN FIGS. 1a, 1b AND 2, PLOTTED BY THE HUYGHENS CONSTRUCTION

violinist, of the sound apparently "rolling down on his head from the ceiling."

The phenomena just noted are strikingly brought out when one listens to a radio program from this hall. T. Rogers Smith, in his excellent monograph on the Acoustics of Public Buildings, mentions the fact that when a speaker stands at the focus of a parabolic sounding board, a device first employed by an English clergyman in 1829, the "echo of his own voice is dinned into his ears in a bewildering manner." Similarly, in the present instance to the radio auditor, an effect of apparently excessive reverberation is most marked. Even when the hall is crowded, the speaker or singer's voice sounds as though delivered in a large empty room. A cough in the audience, sounds to the "listener in," as though the cough was directly in front of the radio transmitter. Examination of Figure 1*a* and Figure 4 shows

that a plane wave, that is one originating at a distant source, will, upon reflection from the rear wall and the ceiling of the stage, be focussed in a region near the front of the stage, occupied by the speaker and the transmitter. Similarly a sound originating on the stage and returned there by reflections from the walls and ceilings of the room will be exaggerated at the transmitter, thus giving an effect of excessive reverberation that is not noted in the room itself. The photograph

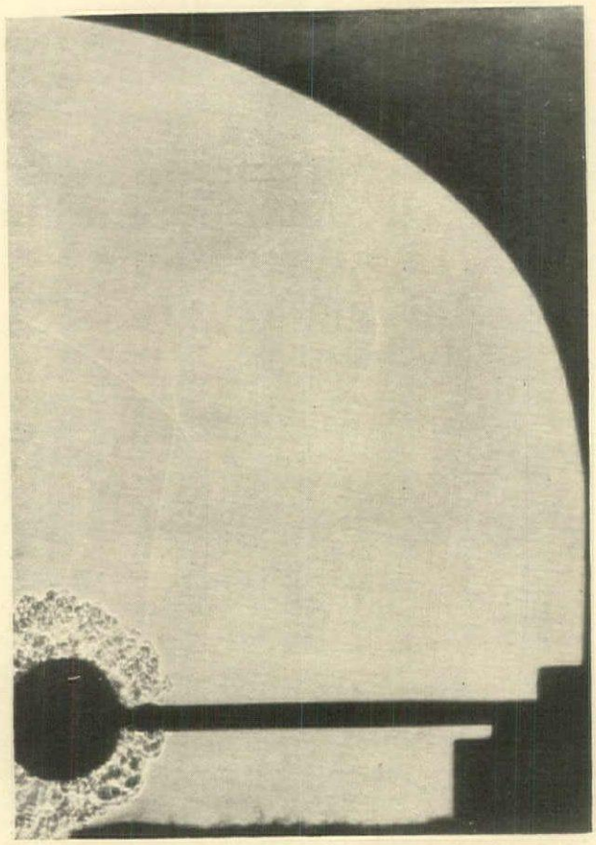


FIG. 4. REFLECTION FROM THE MID-SECTION OF STAGE CEILING

of Figure 5 shows the effect of substituting plane surface for the sharply curved portions at the sides of the stage.

As an explanation of a particular set of phenomena, the foregoing may be of interest. It is not particularly useful from a practical point of view unless it suggests general principles for guidance in design. The Huyghens construction furnishes a means of determining from the drawings the focussing effects of curved shapes whose use is contemplated. Since, however, the curvatures of wall and ceiling surfaces must in general be determined by structural rather than acoustical considerations, even an approximate statement of the limitations imposed by acoustics upon the use of such shapes would be valuable to the designer who is willing at the outset to consider the subject. To rule out curved forms altogether from audience rooms would be safe. It would not be eminently sane, however, since one may cite numerous rooms with altogether admirable acoustics in which such forms are employed. Two notable examples that come to mind are the Auditorium in Chicago and the Tabernacle in Salt Lake City.

A familiar formula from geometrical optics makes it possible to locate regions of concentration from the radius of curvature of the reflecting surface and the distance of the source. If s is the distance measured along a radius from the source to the reflecting surface, r, the radius of curvature, and x the distance from the surface to the point at which the reflected sound is focussed, the geometry of the Huyghens construction gives the approximate relation

$$\frac{1}{x} = -1/s + 2/r \text{ or}$$

$$x = \frac{s\,r}{2\,s - r}$$

From this relation, it is apparent that if the source is at a distance less than one-half the radius of curvature from the reflecting surface, x will come out negative, which means that there will be no real focus of the reflected sound within the room, the condition shown in Figure 2. If this distance is more than half the radius and less than the radius itself, the region of concentration will fall beyond the center of curvature, while if the source is at a distance greater than the radius, the sound will be focussed in a region between the center and the reflecting surface. If the concave surface is spherical, concentration takes place in two planes, and will be very marked. If cylindrical, concentration will take place only in the plane of curvature. One may lay down as a safe working rule that if the architectural treatment calls for extended concave surfaces, the curvatures of these surfaces should be such that the regions of maximum concentration, as computed by the formula given above, will fall well outside the boundaries of the room. This rule pretty well excludes the use of curved shapes in stage walls and ceilings. While it is true that such shapes may be designed to give reinforcement by the reflection of sound to the audience, it is equally true that they are apt to bring discomfort to the occupant of the stage for the reasons already stated. Furthermore in none but the very largest rooms is such reinforcement needed. A voice of only moderate power on a quiet day *in the open* may be heard and easily understood at distances much greater than are ordinarily encountered in any save the largest audience rooms. The theatre stage as ordinarily set, certainly affords little or no reinforcement of sound by reflection, yet with

freedom from extraneous noise, difficulty in hearing is infrequently encountered even in the extreme rear seats. Finally, plane surfaces, properly disposed, are as effective in reflecting sounds as are curved surfaces and are without undesired focussing effects.

The foregoing rule as applied to ceiling vaults calls for a radius of curvature of the main portion of at least twice the height of the ceiling. A curved rear wall should have a radius considerably greater than the distance from stage to rear wall. The semi-circular plan, even in small rooms, is almost sure to lead to troublesome localizations. Spherical domes, with their resultant concentrations in two planes are more likely sources of difficulty than cylindrical forms. They should in general be surfaced with absorbent treatment.

Reverberation and Design

The more frequent occurrence of excessive reverberation as an acoustical defect, and the fact that it can be remedied by lining walls and ceilings with absorbent material is doubtless responsible for the rather prevalent view that such treatment is essential to good acoustics and the too common practice of leaving the entire problem for this kind of solution. It is true that any room may be rendered tolerable in this regard by this method. It is equally true, however, that in many cases an intelligent appreciation from the start of the factors that determine the time of reverberation will go far to a solution of the problem without recourse to the use of absorbents.

Now the time T during which a sound will remain audible in a room after the source has ceased will theoretically depend upon five factors: V, the total volume of the room; a, the total absorbing power of the room, measured in square units of perfectly absorbing surface; E, the acoustic output of the source, expressed in cubic units per second of sound of threshold intensity; t, the time during which the source speaks; and v, the velocity of sound. These quantities are related by the following equation:

$$T = \frac{9.2}{v} \cdot \frac{V}{a} \cdot \log_{10} \left[\frac{E}{a} \cdot \frac{4}{v} \left(1 - e^{\frac{-avt}{4V}} \right) \right] \quad (1)$$

The expression whose logarithm is taken may be shown to be the average intensity of sound in the room at the instant the source ceases, and its value, as is seen, is directly proportional to the power of the source, inversely proportional to the absorbing power of the room, and it will depend upon the duration of the source in a manner given by the expression $\left(1 - e^{\frac{-avt}{4V}} \right)$. This last expression is a fraction, whose value approximates unity with increasing values of a and t. T thus is seen to depend upon the ratio of the volume to the total absorbing power and the logarithm of the initial intensity of the sound throughout the room. Of these three quantities, the designer has control of two—the volume and the absorbing power. Theoretically, at least, he may take into account the power of the sources of sound for which the room is to be used and adjust the volume and absorbing power of the room to the particular use to which it is to be put. But in view of the enormous range of power of both the voice and musical instruments such an attempt would be a purely academic refinement. Actual measurements show that a speaking voice may easily be varied by a factor of 100 and a violin is capable of an equally wide variation.* The adjustment of acoustical power to the requirements of the room may well be left to speakers and musicians.

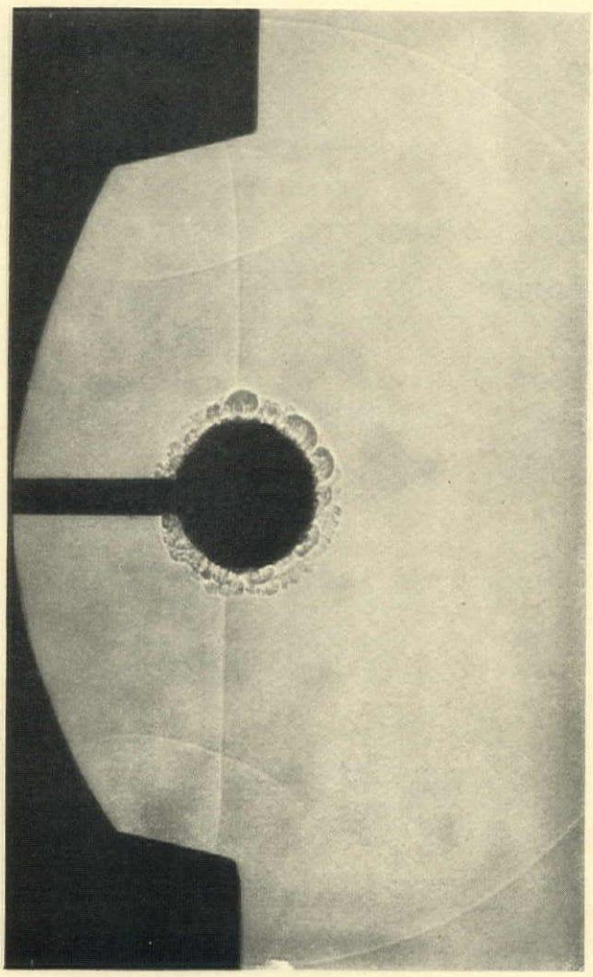


FIG. 5. STAGE PLAN OF FIGS. 1a AND 1b MODIFIED TO ELIMINATE CONCENTRATIONS PRODUCED BY SIDE WALLS

Now, equation (1) can be reduced to a very usable shape, if we can find a value of E that will roughly approximate the acoustic power of sound sources. Measurements have accordingly been

*Physical Review, September, 1923, pp. 303-312.

made by the reverberation method to determine the acoustic output of various sound sources in terms of the threshold of audibility. These measurements included both masculine and feminine voices, over the speaking range in both pitch and intensity, organ pipes, violin and violoncello. As has been indicated, the results of these measurements for any one instrument varied over a wide range of values. But since the value of E enters into the expression only in its logarithm, an average value of this logarithm may be taken that will serve the present purpose. Putting in this value and supplying the constants, equation (1) reduces to the very practical form

$$T = \frac{.0083V}{a} \left[9.1 - log_{10} a\right] \qquad (2)$$

Here the bracketed expression is what Professor Sabine has called the "initial intensity of the residual sound." Upon his assumption that 1,000,000 (log 1,000,000 = 6) represents this intensity under average conditions, equation (2) reduces to his well known formula

$$T = \frac{.05V}{a} \quad \text{(English units)} \qquad (3)$$

It appears, then, that equation (2) is simply equation (3) with a correction term that allows for the change of initial intensity with a change of absorbing power of the room.

In order to use equation (2) as a criterion, an acceptable value of T as computed thereby must be determined. To determine such a value, T was computed from the plans of fifteen different rooms, varying in volume from 3500 to more than 1,000,000 cubic feet which are in actual use and without criticism in the matter of reverberation. A maximum audience was assumed in each case. The times for six of these rooms that are most satisfactory for speech range from 1.12 to 1.20 seconds, with an average volume of 1.15. The range for music rooms was somewhat wider, namely from 1.62 to 2.02, with an average value of 1.75 seconds. The range of time for these same fifteen rooms computed by equation (3) is from 1.0 to 2.4 seconds. It appears then that the value of T, as computed by equation (2), is a more precise criterion of satisfactory conditions as regards reverberation, and also one in which the desired value is not a function of the size and absorbing power. As a working rule then it may be said *that the time of reverberation for an auditorium with its maximum audience as computed by equation (2) should lie between 1 and 2 seconds.* For speech and light music, it should fall in the lower half of this range, while for music of the larger sort it may lie nearer the upper limit.

Having arrived at a usable criterion of excellence, the designer's problem becomes simply a question of adjusting the two factors, volume and absorbing power, so as to secure the desired result. Accordingly, a ready means of estimating the total absorbing power is highly desirable. For this purpose it is convenient to divide the total absorbing power into two parts, that due to the empty room exclusive of the audience, and, second, the absorbing power of the audience. The latter is easily obtained by multiplying the number of persons in the audience by the absorbing power per person, 4.6. The former may be obtained by summing the areas of the various surfaces each multiplied by its known absorption

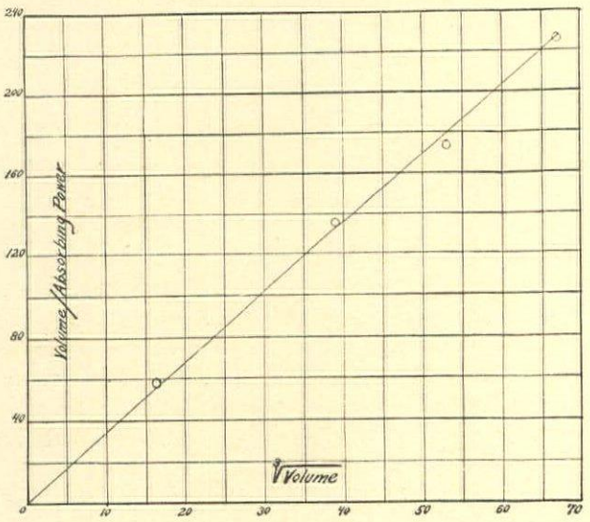


FIG. 6. GRAPH SHOWING THAT THE RATIO OF VOLUME TO ABSORBING POWER FOR EMPTY ROOMS OF ORDINARY CONSTRUCTION IS PROPORTIONAL TO THE CUBE ROOT OF VOLUME

coefficient. A readier means of approximating this value is found by using the data presented in Figure 6. These data were obtained from computations made from the plans of some fifty audience rooms of what may be considered normal interior finish, that is to say, rooms in which the sound-reflecting surfaces were either of masonry, including plaster on the various bases to which it is ordinarily applied, and wood, including wood seats without upholstering. The absorbing power of each room was computed on this basis. The rooms were grouped according to volume, and the average volume and the average absorbing power of each group taken for the points of the graph. The horizontal distances are proportional to the cube roots of the volume, and the vertical distances to the ratio, V/a. As is to be expected, the points so plotted lie on a straight line, the equation of which may be written

$$V/a = 3.4\sqrt[3]{V}$$

or

$$a = .29\, v^{\frac{2}{3}} \text{ or } .29\, \sqrt[3]{V^2} \qquad (4)$$

Obviously this is a purely empirical relation, and

one, which in exceptional cases, may not hold with any considerable degree of precision. But comparison of the values of a obtained by equation (4), with the values computed by the more accurate method shows that it is sufficiently accurate for practical purposes. If in a particular room there is to be any considerable amount of absorbing material, such as heavy draperies, carpets, upholstered seats or cushioned pews, their absorbing powers figured from areas and known absorption coefficients should be added to the value of a given by equation (4).

Putting in the values for the absorbing power of the room and of the audience in equation (2), we have

$$T = \frac{.0083\ V\left[9.1 - log_{10}\left(.29\sqrt[3]{V^2} + (4.6 - s)n\right)\right]}{.29\sqrt[3]{V^2} + (4.6 - s)n} \qquad (5)$$

in which s is the absorbing power of an empty wood seat and n is the number of persons in the audience. This expression is convenient in that it involves no quantities that are not known from the plans of the room.

We may illustrate the use of the formula by applying it to the plans of a high school auditorium recently called to the writer's attention. The room was to have a seating capacity of 1650 and a computed volume of 368,000 cubic feet. The seats were wooden opera chairs without upholstering, absorbing power .3 units per seat. The cube root of the volume is 71.7 and the square of this number is 5140, which, multiplied by .29, gives 1490 units as the absorbing power of the empty room and seats, according to equation (4). Computed by the process of summing up the separate areas each multiplied by the proper absorption coefficient, the absorbing power is 1590 units. The difference is of negligible importance. The absorbing power that will be added by the presence of 1650 persons, each with an absorbing power of 4.6 units, seated in chairs whose absorbing power is each .3 units is 1650 (4.6 — .3) or 7100 units. Adding the absorbing power of the empty room, the total is 8590. The logarithm of this number is 3.94. These values in equation (5) give

$$T = \frac{.0083 \times 368000\ (9.1 - 3.94)}{8590} = 1.83 \text{ seconds.}$$

The upper curve of Figure 7 represents the values of T, as computed above, plotted against the number of persons in the room. Remembering that T should be less than 2 seconds for good conditions, it appears that with any but the capacity audience the reverberation will be too great even for music and that, even with all the seats filled, it will be excessive for good speaking conditions. The obvious remedy is to provide for the introduction of absorbent material. If the volume is predetermined, this is of course the *only* remedy. In this particular instance, however, the requirements of the room itself would allow a material reduction in the volume. The plans called for a ceiling height of 48 feet. However the ceiling could have been lowered some 10 feet without materially reducing the seating capacity. This change would reduce the time of reverberation from 3.4 to 2.7 seconds with an audience of 800 and from 1.8 to 1.5 seconds with a capacity audience. While this would not give an ideal room for the purpose intended, it would effect a

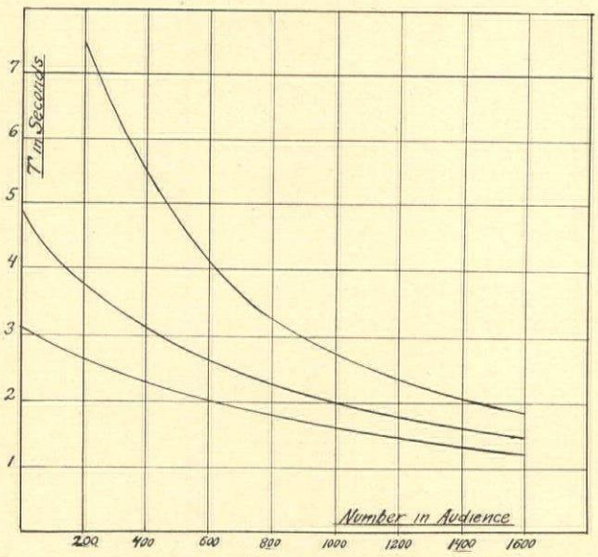


FIG. 7. GRAPH SHOWING EFFECT OF AUDIENCE, AND OF THE NATURE OF PLASTER ON TIME OF REVERBERATION. SEE LAST PARAGRAPH OF TEXT

noticeable improvement, and materially reduce the amount of absorbent treatment required to give entirely satisfactory conditions.

It will be noted that for the room with a capacity audience, about 83% of the total absorbing power is represented by the audience. This is fairly typical of all the fifty rooms studied. It follows then that, without sound absorbents, the time of reverberation will be largely determined by the ratio of volume to the number of persons in the audience. If the designer's program calls for a room that shall be acoustically tolerable when all the seats are occupied, the solution becomes only a matter of keeping the ratio of volume to seating capacity sufficiently small. Without giving the details of the analysis, it can be shown that, in a room having no considerable area of absorbent material, the time of reverberation with all seats filled will fall within the prescribed limits, if the ratio of volume in cubic feet to the number of sittings is 175 or less. A value of this ratio much greater than 175 will call for the use of absorbents to give satisfactory conditions with even the maximum audience. In case the program calls for a room with a maximum seating capacity

much greater than the average audience which will ordinarily occupy it, this situation can be partially met by specifying upholstered seats, carpetings and the like. But even this in large rooms with lofty ceilings may prove insufficient. In the latter case, the architect's pride as well as the owner's purse may be spared a great deal by knowing in advance and providing for the needed treatment, before rather than after completion.

Finally, it is to be noted that a large part of the difficulty of securing good conditions in a room under all conditions lies in the fact that the absorbing power of the walls and ceilings of the room is so small a part of the total when the audience is present. As a result, a room that is satisfactory with a capacity audience may be far from satisfactory when one-half or even two-thirds of this number of persons are present. A simple computation from equation (4) shows that the average absorption coefficient of the surfaces in an empty room of the usual interior finish is between four and five per cent. The result is that the number of persons in the audience is the determining factor in reverberation. The ideal remedy for this condition lies in the development of masonry materials with considerably higher absorptive efficiencies than those of modern practice. The acoustical tile developed by Professor Sabine fully meets this requirement in rooms in which the interior treatment permits its use. This material practically removes the acoustic limitations imposed on the use of curved walls and ceilings. As a supplement to this extremely useful material, a plaster with absorption coefficients several times as great as those of ordinary plasters should prove a valuable contribution to the problem of securing good acoustics under all conditions. Experiments in the development of such a material were begun in this laboratory more than four years ago. The practical requirements that in the mortar state this material should behave like other mortars under the trowel, and that in the hardened state it should look like other plasters, are not easy to reconcile with the physical properties required in a hard material having a high degree of sound-absorbing efficiency. It is hoped, however, that the results as described in these columns by Professor Foley* of the University of Indiana will justify the effort, by affording a material that will help to make satisfactory acoustic conditions in modern rooms the rule rather than the exception.

The improvement produced in a room by using a wall and ceiling surfacing of a material whose absorption coefficient is no greater than 16%, let us say, instead of the 2 to 3.5% of ordinary plasters is shown by a comparison of the lowest curve of Figure 7 with the upper curve. The former is obtained by assuming the walls and ceilings of the high school auditorium referred to, to be covered with a plaster having 16% absorption. For any audience greater than 500 persons in this room, the reverberation will not be excessive, whereas, with the usual materials, the room would be too reverberant even for music, with any audience less than 1500. The middle curve shows the conditions, assuming that the ceiling alone is done in the more highly absorbent material while side walls are finished in ordinary plaster. Whether the condition shown in the middle or in the lowest curve is to be preferred will depend upon the use to which the room is more apt to be put. For general auditorium purposes of both music and speech with the possibility of an occasional small audience, the more highly absorbent condition would be preferable. For a concert room with the expectation of an average audience close to the seating capacity, the conditions represented by the middle curve would be recommended. The important point is that with such a material available any desired condition may be approximated using only structural and fireproof materials.

*THE AMERICAN ARCHITECT, *April* 11, 1923.

BASIS OF MEASURING FIRE LOSS

AT the annual meeting of the National Board of Fire Underwriters, held in New York, May 22, 1924, H. A. Smith, President, made the following significant statement:

The enormous annual destruction of property by fire, with its consequent appalling loss of life continues without abatement commensurate with the efforts made to check it; although inasmuch as during the past ten years the average rate has decreased about 12.6%, with a decrease in the ratio of losses to premiums of 5.4%, it is apparent that our fire prevention work has made some headway. This is more evident when we consider that the burnable values have increased 120% as against a 70% increase in fire losses—while the population has gained but 16%. *In other words, there has been a noticeable reduction in the fire waste, when compared with the great increase in burnable values. These percentages make it apparent that any per capita basis of measuring the fire loss is misleading.* Improved fire fighting appliances, increased efficiency in the personnel of fire departments, better water supplies, more fire-resistive building construction, are important reasons why the fire loss should be lessened. Fire prevention activities of state and municipal authorities, and pronounced interest in the subject on the part of business organizations, are encouraging. The extensive and valuable work of this Board, with the co-operation given to it by national, sectional and state associations, all interested in fire prevention, and the development of improved methods, support our hope that greater progress may soon be apparent. There is no drain upon the resources of this country more serious than the destruction of our created values—totalling last year some $508,000,000. It is conceded that 75% of our fires originate in preventable causes, and we will not yet admit the impossibility of impressing upon the public mind that the exercise of greater care will materially reduce the preventable loss. The lack of care and forethought, so pronounced in the mad rush of today, can be lessened if we, as insurance men, with more assistance from all agencies interested in the question, increase our efforts and receive from the public and authorities a full measure of the co-operation which they are able to give.

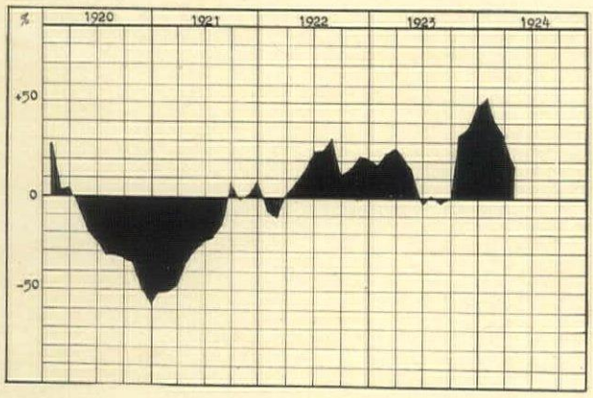
Mr. Smith's suggestion that the ratio be based on the total burnable value is correct, but not as appealing perhaps as the ratio to "every man, woman and child."

ECONOMICS *as* RELATING *to* ARCHITECTURE

The Outlook

A DETERMINED step toward conservatism is quite noticeable today in the building and construction industry. New business, when corrected for the usual seasonal influences, is hastening rather precipitously to territory that has been normal for the past five years. Hounded by higher costs and the advancing approximation of a balance between supply and demand, the volume of new undertakings has fallen from a height of some 50 per cent above to one only 18 per cent above normal. The recession, moreover, has been general and applicable to the country as a whole. In March, it will be recalled, metropolitan New York grew factious and bolted from the main trend, refusing to participate in the general retreat. Demand there shot ahead by leaps and bounds. But April returns showed that even this district is not holding the position attained in the March advance and is now falling back. In the months immediately ahead, these declines are likely to continue in a moderate way, and the curve of contracts awarded will very probably broaden out in a horizontal movement as it reaches a degree of activity that has been about the average for the past five years.

VOLUME OF BUILDING



A more conservative movement is noticeable in the tendency of the volume of contracts awarded to return to a plane nearer normal. Demand is receding, and although the recession is likely to continue in the next few months the curve's decline is expected to lose its present acuteness. The black area comprises the volume of contracts awarded, measured in square feet of floor space, in the 27 states covered by the F. W. Dodge Corporation. Normal (0) is the average for the five years 1919 to 1923. The curve is corrected for seasonal variation

Advancing wages have more than counterbalanced the decline in materials prices and the result has been a fractional advance in building costs. This item of expense is now 3 per cent higher than a year ago, and is still revealing a slightly rising tendency. The labor component is in a very strong position and mild advances may be expected as the season progresses. Builders' materials, on the other hand, have been in ample supply, and when the markets have been confronted with a slight recession in orders, prices have yielded perceptibly. More slight recessions are probable, and this tendency of the materials component to lag suggests that the ascendency of the labor factor may be slightly offset producing a sidewise movement—perhaps a very slight advance, or even a very mild decline—in the net effect upon costs. No substantial change either way is expected.

Present Statistical Position

New building begun in April this year was about 3 per cent under the amount, measured in units of square feet of floor space, undertaken in that month a year ago. Due to heavy Winter activities, however, the volume of new construction started in the first four months of this year surpassed that begun in corresponding months last year by about 8 per cent. From the production man's point of view, 1924 still has a comfortable lead over the banner year of 1923.

Now the seasonal increase in new jobs started in April over those begun in March is ordinarily about 5 per cent. Contracts actually awarded in April, however, not only failed to make the usual seasonal gain, just as a football team may not make the required distance in the "downs" at its disposal, but actually fell short of March's achievements by about 8 per cent. When this showing was corrected for seasonal variation, it brought the volume of April's new undertakings down from the March level 33 per cent above to a point only 18 per cent above normal. This represents a rather severe decline and indicates that the industry, broadly speaking, is bending every effort to restrain demand and to adopt a conservative atti-

tude toward the future—a most commendable policy. March, April and May are usually the peak months of the year, the palm, during the four years passed, going to April. May's new business customarily shows a 4 per cent drop from the April peak, and, although May returns have not appeared at this writing, they are expected to carry on in a more moderate way the decline which began in February.

Factors Retarding Demand

This recession in demand for new construction has been the direct result of the operation of a number of factors. One of these has been the efforts on the part of architects, bankers and contractors to control the volume in which new business has been appearing. The results have been most beneficial to the industry. It has spurred the trade to Winter building, which has distributed the industry's general burden and provided a longer period of employment. Above all it has stepped in when the weight of new business has been staggering and averted a breakdown. You have seen a teamster on a hot Summer's afternoon "spell" his horses upon the first level space on a long, high hill that they may breathe and rest, the better to pull the remaining grade, so this factor of restraint has made it possible for the construction industry to avoid an overwrought condition. Here is a case of regulation being applied at the right end. Stability has been strengthened with the minimum amount of disturbance.

Another, but less picturesque factor perhaps, has been rising construction costs. This feature of expense has mounted steadily, but in a rather zigzag fashion, since the first of the year. It is now slightly above the high point in 1923, which resulted in the marked decline in building that began in June of that year and lasted until the following October. With other factors favoring a decline in demand it is obviously reasonable to expect a recession in new business when costs have again reached those heights.

Still another factor favoring a declining demand is the belief, now growing general, that an approximate balance between the demand for shelter and the supply of it is in the not remote future. This belief is contributing to the general feeling of caution. Deficiencies still prevail in the supply of moderately priced dwellings and apartments, schoolhouses and public buildings, but conservative opinion has it that the supply of the remaining classifications is good and in some instances it is ample. Overproduction in some cases is passing from a state of imminence into one of actuality. Rents and markets have not been materially affected, however, and today this feature of supply has not attained the importance it will probably acquire later as a market factor.

And, finally, the general lack of confidence and the prevailing feeling of caution and hesitancy have undoubtedly had a part in the reactionary movement of demand. This depression in sentiment is essentially a psychological condition, and while it has a relationship to the basic trends underlying the present economic situation, it does not reflect a comprehensive picture of these trends and it plays no major part in determining their courses. This prevailing pessimism should not be alarming in its significance, for like a skunk in one's dooryard, its presence presages no impending disaster, but nevertheless it is a distasteful thing to have around. The November elections will do a great deal for the business man's state of mind, for his perplexities arise out of political rather than economic causes. Meanwhile, the coming elections with their attendant political uncertainties, the outlook abroad, and concrete evidences of an industrial recession will probably check and restrain all new business including the contemplation of building projects.

Factors Favoring Heavier Demand

Of the factors at work on the side of demand the rising standard of living is by far the most potent and motivating. It is obviously the outgrowth of the good times that have prevailed since the industrial debacle of 1920-1921 and which have a prospect of continuing—slightly modified, perhaps—for some time yet. Recent surveys of the national rental situation have brought out the influence of this rising standard of living in the disclosure of great gaps between the rent charged for the best class of structures in the most desirable locations and that charged for medium grade structures situated in the middle class residential districts. The gap registers a rising dissatisfaction with any other than the best and most modern accommodations.

This same ascending standard of living—stimulated by peak wages, full employment, growing salaries, and a generally higher industrial earning capacity—vitally affects the ability of a people to withstand taxes and assessments to pay for schoolhouses and public buildings, to give greater donations for the erection of clubs, memorials and churches, and to invest in bonds the proceeds of which build our theatres, and commercial and industrial structures. When their living standard is rising people are agreeable to the construction of these facilities, but when their standard is under pressure such expansion usually incurs their hearty disapproval. So, with the deficit waning in power and significance this factor has been accorded a place of first importance, for in the demand created by it the building industry will find both its own prosperity and its depression.

Because the public's standard of living is such a vital factor in his industry, the architect will want to look now to the industrial situation to learn the probable future of this all-important

force. Business confidence, as we have already intimated, is submerged in a slough of doubt and apprehension because of the current political situation. Congress has approached the vital problems of this session much as a horse would approach a big bass drum, much prancing, pawing and posing, but with comparatively little progress. With a troubled belief in the future security and profitableness, business cannot progress. As a consequence, forward buying is an extreme rarity, and business men are purchasing only for their immediate needs. Caution rules supreme.

A policy of such universal adoption would naturally result in drooping commodity prices. The index of the Bureau of Labor Statistics, which is, perhaps, the most representative of the general price level, dropped to 148 in April in contrast with 150 in March, 152 in February and 159 in April a year ago. The Irving Fisher index shows still further declines in May in contrast with April, and the trend of confidence and industrial activity do not indicate that the depth of the movement has yet been reached. A natural concomitant of this weakness in the general price level has been a curtailment of activity in almost all of the basic industries. The Federal Reserve Board's index of production in twenty-two of these basic lines fell from 121 in February to 116 in March and to 114 in April. This decline is expected to be continued in May. Car loadings have fallen off in April in contrast with March and they are running slightly under the high levels of corresponding periods in 1923. While the heaviest drop has been in coal shipments, still this receding volume of traffic points to a slightly diminishing movement of merchandise from centers of production to trade channels.

The weaknesses of the present industrial situation have been its spottiness and its utter lack of balance. "Various products and services," writes Vice President George E. Roberts, of the National City Bank, "must be offered on the market in relative quantities and at relative prices which will enable the market to clear itself. When this is accomplished we have prosperity. Otherwise, we have congestion and inability to distribute products, with a loss in purchasing power for a part of the population which eventually causes unemployment and depression." The inequitable distribution of purchasing power today is a condition which has grown, broadly speaking, out of a lack of relativity in production and prices and the resulting inability of markets completely to clear themselves. The good times, peak wages, and full employment of the past two years have prevailed largely because of the pronounced activity of some few basic industries, a large demand for whose product has arisen out of some deficiency attributable directly to the war. Meanwhile, other trades have found the going hard, and in some instances unprofitable. A redistribution of these good times on a more equitable basis seems near at hand, for the enormous need for the products of these hitherto active industries appears to be returning to a more normal basis—such demands, for example, as the railroads have had for equipment, the automobile industry for iron and steel, the oil industry for field and storage equipment, and the building industry for its multifarious supplies. Astute and conservative observers of economic trends feel that some readjustment in these hitherto abnormally active lines is impending.

Wholesale trade, generally speaking, increased slightly in March over February; and the volume of sales of some three hundred retail stores, according to the Federal Reserve Board, held up well in the same period. Later months will probably reveal only slight changes either one way or the other, for the trend of unemployment, lighter though it has been, has not declined sufficiently yet to affect the volume of retail trade. This high degree of consumption, fairly heavy employment and presumably light inventories all unite with an abundance of cheap credit to make the broad general outlook of business stable and secure. A panic is obviously beside the question; a pronounced industrial depression is hardly probable. Speculation during the past two years has been held in check, and valuations, with the exception of improved property, are not inflated. With credit in ample supply the essentials in the situation are sound and healthy. While it is not certain that the standard of living will continue to rise there is no suggestion that it will abruptly decline.

With the advancing living standard there have been several other factors operating on the side of demand. An important one has been the trend of rents. These have attracted the investment builder because of the yield promised him on his money, and likewise the tenant, who has found his rental charges in excess of the interest upon the money required to build his shelter. Moreover, the abundance of easy credit often leaves the prospective builder powerless to resist and he succumbs completely to its temptation. Furthermore, a good market for improved property exists and the builder frequently commits himself on the rather hasty assumption that times will ever be thus and he can get out of the property as much as he has sunk into it. These factors, however, and with the exception of easy money, are all dependent upon the demand created by the ascending standard of living, and may be expected to rise and fall with it.

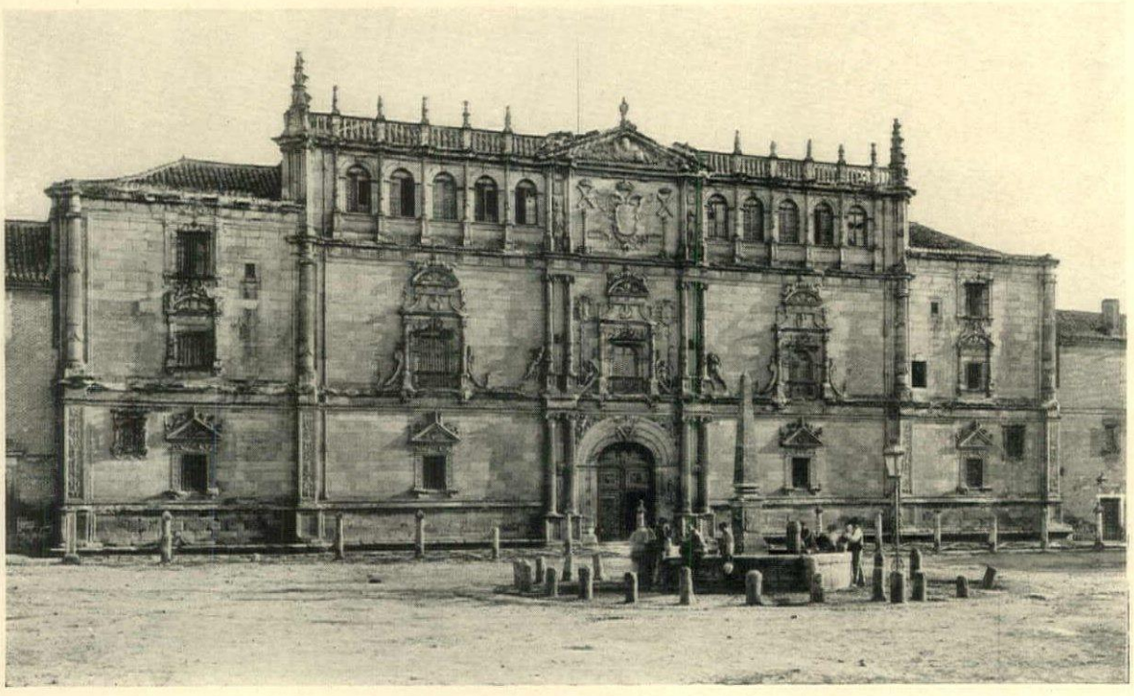
Costs Moving Slightly Higher

Costs have held and will continue to hold a steadying hand upon the trend of the industry. With expenses at their 1923 peak new business has subsided as it did last year. An abatement of these high costs is not in sight yet. Employment

is full and the trend of wages is still upward. A busy season, brooking few, if any, reductions in labor costs, is immediately ahead. Curtailed activity in general business, however, points to some unemployment, some attempts at wage cutting, and a probable increase in the number of labor disputes. The effect upon the building industry depends upon the length of this industrial depression and the duration of activity within the industry itself. The building industry will be able to draw labor from the less active trades, but wage agreements are not likely to undergo revision in months immediately ahead. Happily the construction industry is distinguished by its calm labor skies, from which it would appear that the more astute of these organized workmen have seen, in the declining demand, the hand writing upon the wall.

Materials prices, viewing the market as a whole, are soft. The weakest spots have been structural steel and some classifications of lumber, principally pine. Cement prices, according to the *Engineering News-Record* index, have not changed, but increasing production and rather heavy stocks certainly rob the market of its statistical strength. Shipments for the past four years have been under the record totals of last year. An unusually heavy demand for common brick in both Chicago and New York has increased orders, according to the Common Brick Manufacturers' Association, more than 26 per cent, and the general trend of prices is one of strength. The materials market will tend to move in sympathy with the general commodities market, and with demand declining in the building industry buoyant prices are not to be expected. Production in the weaker lines is being curtailed in an effort toward stabilization of values. There has been little forward buying of builders' supplies, and prompt mill deliveries have induced buyers to purchase for immediate requirements only.

Mortgage money, as a feature in the expense of building, has likewise moved to slightly easier levels. Rates have not changed noticeably, but when compared with a year ago the tension in the mortgage money market has been lessened perceptibly, and largely through ease in general interest rates. And yet, the essential features, as they affect the banker, have not altered. High valuations and the probability of a moderate advance in costs are danger signals indeed, and should call for precautionary measures from the man lending money upon the security of improved property. The banker should do his part in restraining all unnecessary building at this time, when the industry is carrying an exceedingly heavy burden, and he should counsel his customers to postpone their projects until costs are lower. Although money is plentiful and pressing the banker rather hard for employment, still he cannot strengthen his position, nor can he benefit the client nor the building industry by financing jobs which do not meet a definite, existing need. To protect his investments the banker should continue to scrutinize his risks very carefully, lending only to a conservative percentage of a fair valuation of the property, and he should construe that valuation as near a pre war basis as possible. A declining improved property market is not many years removed. Our clearest economic thinkers are of the opinion that prices, over a period of years, will return to approximately where they were before the war. These men point to the fact that values underwent such a movement between 1865 and 1900 and the general feeling is that this particular phase of economic history will repeat itself.



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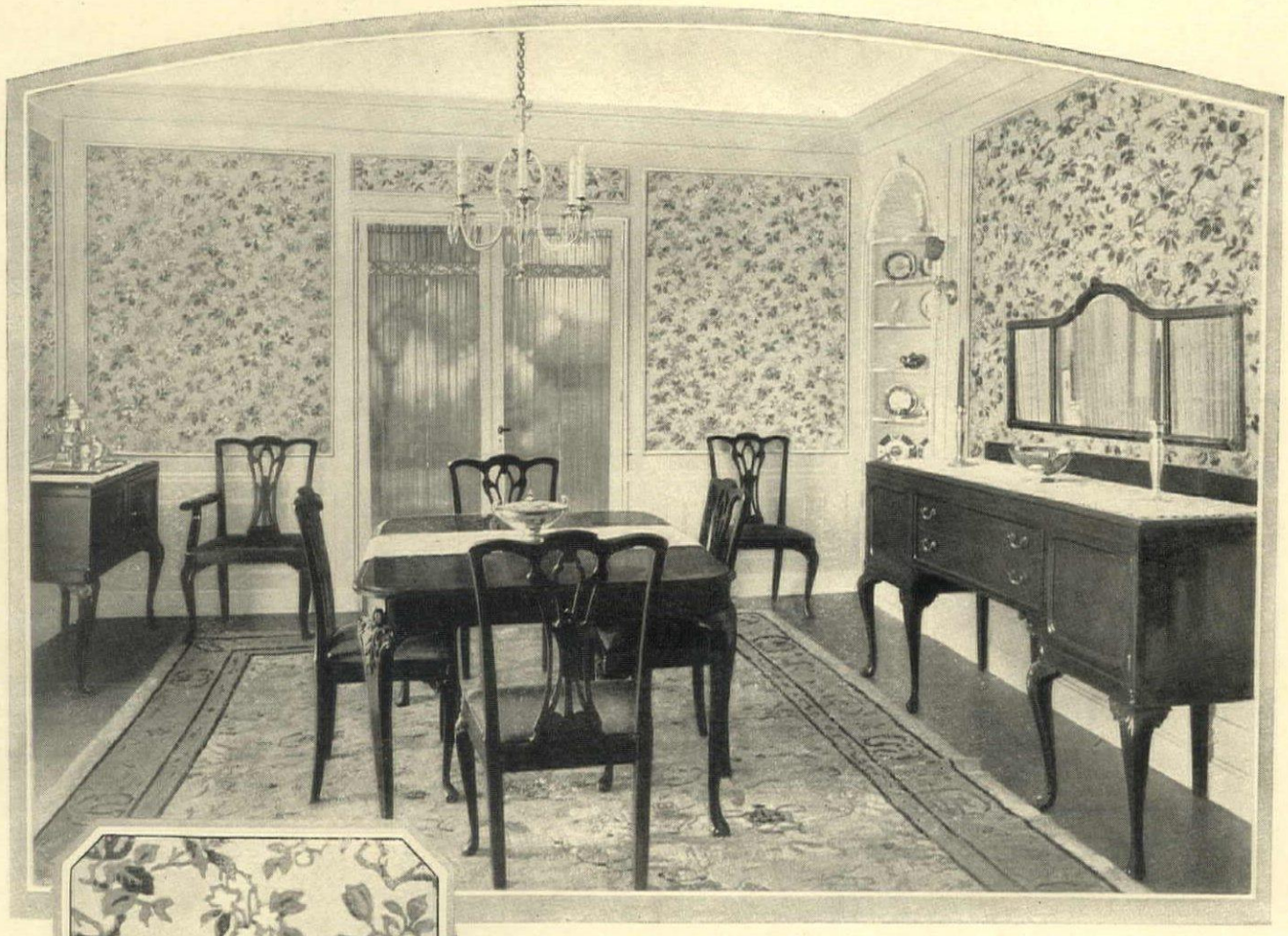

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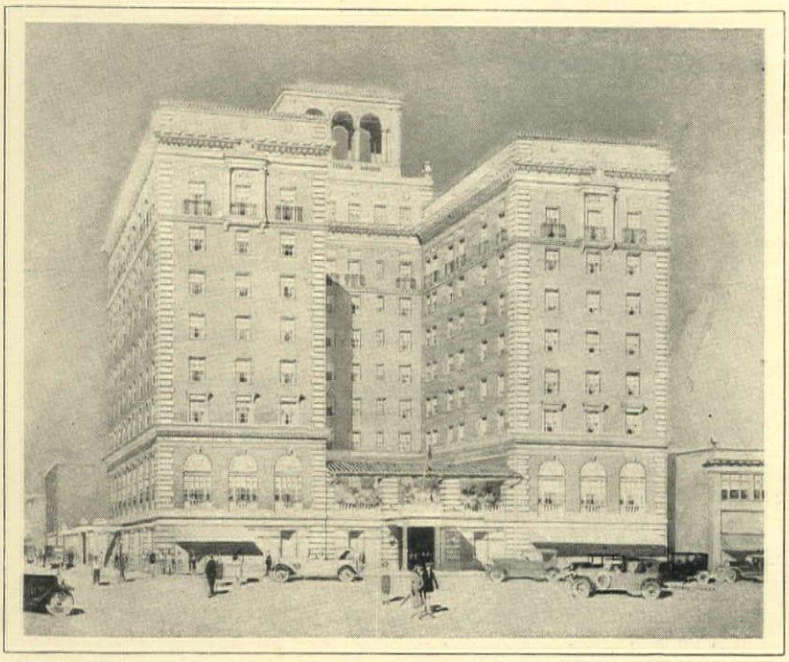

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THE "OR EQUAL" PHRASE

AS Chairman Swern of the Entertainment Committee stated at the April meeting of the Illinois Society of Architects, the use of the specification phrase "or equal," probably is the result of a lazy mental attitude, rather than because of the specifier's desire to avoid the making of a choice. Much effort has been expended by manufacturers of building materials looking toward the elimination of this phrase in specifications, and there is no doubt that it is used to a far less extent now than formerly. As with every question, however, there are two sides to this one, and the careful architect will not permit the entreaties of the manufacturer to sway him in the choice of his words unless his judgment coincides with the belief of the person urging the elimination of the phrase in a particular instance.

A word of caution may be well in view of what seems to be a universal endeavor on the part of advertisers to force a phrase that is definite by the name of a particular product or names of several manufacturers of the same kind of product. There are times when the exigencies of the occasion demand that the architect specify a material with the phrase "or equal thereto" appended. His judgment alone can rule as to whether the use of that phrase in the particular instance is proper. There is no reason why one of several materials cannot be set up as a standard if the architect really is willing to accept without question any other material that may be submitted for his approval as long as the concensus of the profession is that there is equality.

But this, it may be said, is the crux of the situation. There are many cases where the choice of the architect is based on desiderata that include the submission of other items on the basis of equality with that specified. The situation of the item in building construction, the facility of its use, or the permanence under the use conditions, may call for a special article which only one manufacturer makes. Further, if the architect uses the "or equal" phrase, in order that he may maintain friendly relations with one of the advertisers or manufacturers of material which he has not specified by name, it would be better for him if he would frankly tell the one in evident disfavor that his material could not be considered and eliminate all chances for argument. Where the name of a manufacturer or a particular item is specified, to the exclusion of any others, the specifier sets up a target at which all the competitors will shoot, and if the architect is not desirous of fostering warfare, he will not invite it in that fashion. It is difficult enough to make the specifications precise and absolute. Arguments always will arise, no matter with what care the specifications are written, as human nature is unavoidably quarrelsome where competitive business rules.

If the architect is able to write his specification without naming a particular manufacturer or item, he may eliminate some trouble, but on the other hand, other difficulties may arise. He may be overrun with requests from all the producers of that item to approve the material submitted, and if disfavor annoys any of them, they may appeal to the owner. This, of course, means the introduction of unfortunate controversies that will be three-cornered unless the owner accedes to the instructions of his architect. Some owners unfortunately feel that when an architect specifies by name he is unduly favoring that person, and the backbone of the architect must be strong enough to support his judgment after it has been expressed in the specifications. The wise architect will analyze each specification for material on the basis of general worth, serviceability, and cost, and after making his choice, will see to it that the situation is maintained in his control. So, while the phrase "or equal" as a general rule should be eliminated from specifications, an architect should do his own thinking on this matter and not follow blindly the suggestions of manufacturers or material men.

The discussions given at the April meeting on this phrase were most interesting, and there is no doubt that those present gained some thoughts of value to them in their future work. Such discussions are very much worth while to the members of the Society.—*Monthly Bulletin, Illinois Society of Architects.*

ROMAN DISCOVERIES AT COLCHESTER

FROM the English architectural press it is learned that excavations at business premises in High Street, Colchester, England, have resulted in the finding of a large quantity of Roman and mediaeval pottery, Samian ware, coins, a bronze brooch, and a slab of moulded stone. A massive Roman wall was also found.

VIRGIL'S TOMB TO BE MADE A WORLD SHRINE

PREMIER MUSSOLINI recently ordered the purchase by the Italian Government of the tomb of Virgil, which now is private property.

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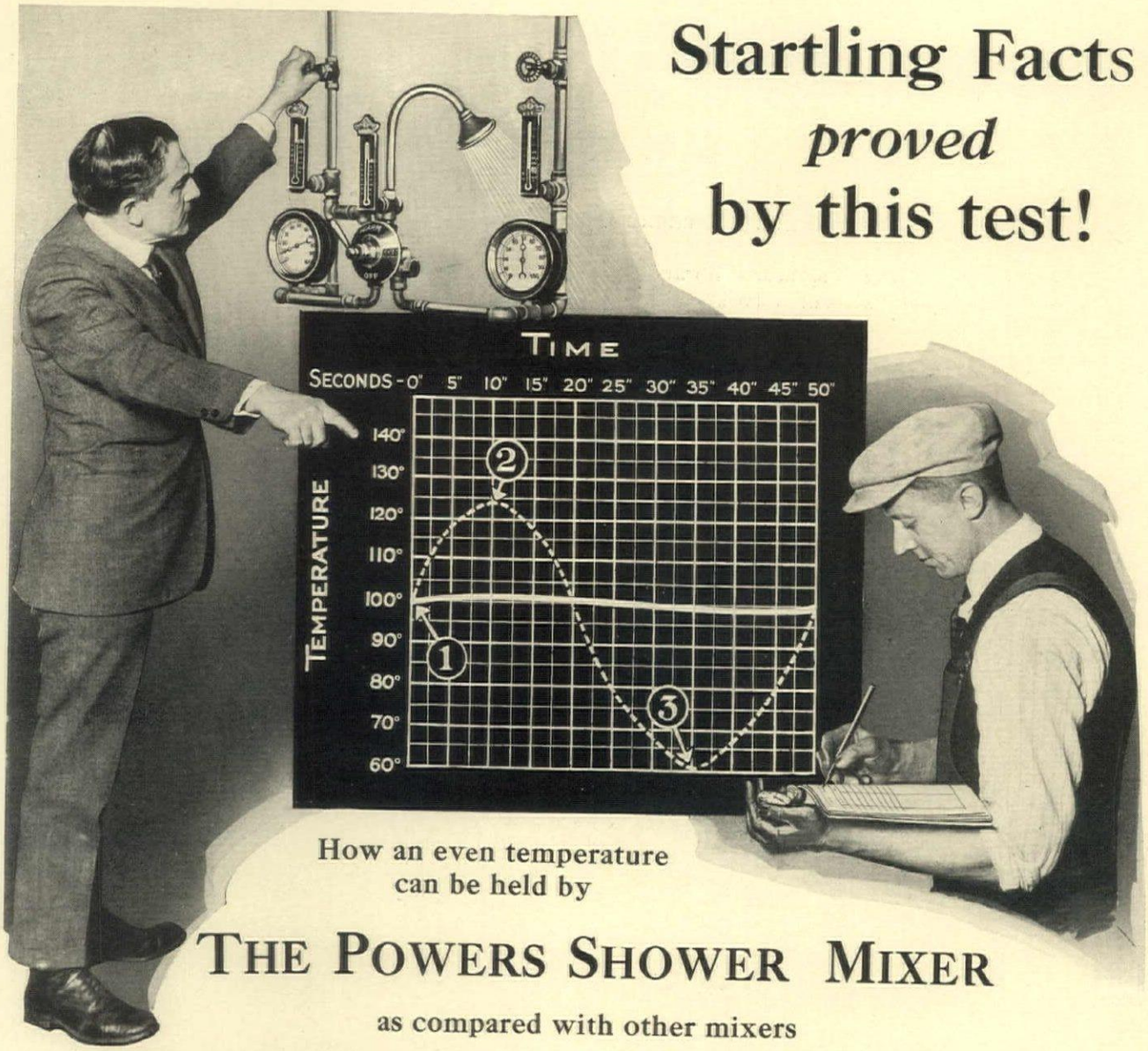

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Temperature of cold water is 40° F., hot water 170° F. Pressure on both lines 50 lbs. Handle of Mixer is turned to "WARM" and temperature of water flowing from shower head is 100° F.

At Point 1. Cold water pressure is cut down to 10 lbs., hot water pressure is still 50 lbs.

Result. *With ordinary shower mixers,* temperature rises 25° in 10 seconds. See dotted line on chart. Bather under shower would get a "shot" of hot water.

With a Powers Mixer, temperature of water remains constant at 100° F. See solid white line on chart.

At Point 2. Cold water pressure is restored to 50 lbs., hot water pressure is cut down to 10 lbs.

Result. *With ordinary mixers,* temperaure of water drops 65° in 25 seconds; bather under shower would get a "shot" of cold water here.

With a Powers Mixer, temperature of water remains constant at 100° F.

At Point 3. Pressures on hot and cold water lines is 50 lbs. With equal pressures, temperature of water with ordinary mixers returns to 100° F., the starting point.

Conclusion. *Ordinary shower mixers* do not protect bather from scalding or sudden "shots" of cold or hot water caused by pressure changes when nearby showers, faucets or flush valves are used. *A Powers Mixer,* regardless of violent pressure changes, always holds the water at whatever temperature is desired.

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BOOK NOTES

MOVABLE AND LONG SPAN STEEL BRIDGES

A STRUCTURAL engineer's library would be incomplete without a book on this subject. Now that some architects assert the right to collaborate with engineers in designing bridges, it necessitates their having a clear comprehension of the underlying engineering principles. Without this knowledge they would be unfitted to participate in such work. Ornamentation or adornment of a bridge, to be successful, must participate in the essential structure, otherwise it is an excrescence, like much ornamentation on buildings. To those architects, then, who do or who anticipate entering into the domain of bridge design, this book is of value.

The bascule bridge is treated more completely than in any other publication. Certain types have been developed into structures of real beauty. This is true notably in Chicago where there has been co-operation in design between the City Bridge Engineer and a joint committee of the Chicago Chapter, A.I.A., and the Illinois Society of Architects. This type of bridge has been developed since the completion of the Van Buren Street Bridge, Chicago, in 1893. The lift bridge, as yet, has not been developed into a thing of beauty, probably because they are few in number and located where economy of construction is considered of more importance than appearance.

Continuous and cantilever bridges, of the through type and of large span, offer little opportunity for designing consideration other than for stability and durability. They have no parts above the piers except bare skeleton frames whose proportions cannot be altered to conform to more pleasing outlines. Suspension bridges are susceptible of being beautiful and the Brooklyn Bridge is a fine example of good designing from the artistic standpoint. The steel arch bridge, from its very nature, often offers fine opportunities for treatment. All of these types of steel structures are included in this book, as well as swing bridges which, fortunately, are fast going out of use.

This volume is the work of eight contributors, each experienced in the particular phase of the subject allotted to him.

Movable and Long Span Steel Bridges, by George A. Hool and W. S. Kinne, Professors of Structural Engineering, University of Wisconsin, Editors-in-chief, and a staff of specialists. 496 *pages, illustrated,* 6x9 *in., cloth. McGraw-Hill Book Company,* 370 *Seventh Avenue, New York City. Price* $5.00.

LONDINIUM, ARCHITECTURE AND THE CRAFTS

THE materials that are used in building construction have changed but little. Their form, however, has been in some cases greatly modified. New combinations have been made, such as steel with concrete, which makes possible some buildings of this age. Masonry walls, first built without and later with mortar, are in principle the same today as throughout the ages. The shape of the bricks, tiles or stone and the make-up of the mortar have changed but the walls are essentially the same. The same may be said of mosaics and many other elements of buildings.

Mr. Lethaby has collected all of the available data concerning the building of London from its earliest architectural history. The earliest traces of building construction in London are those of Roman origin which have been found in excavating for new buildings. These remains consist of almost everything that is used in a building except certain parts of wood. But of the wood used by the Romans some piles and pieces used under mosaic floors have been recovered.

The book consists of twelve chapters which describe building materials and methods; buildings and streets; walls, gates and bridges; cemeteries and tombs; some larger monuments; sculpture, the mosaics; wall paintings and marble linings; lettering and inscriptions; the crafts; early Christian London and the origin of London. Many of the articles described are shown in the 175 illustrations which the book contains. When one compares the forms of some of these ancient things with modern forms, the question sometimes arises as to whether the old forms are not the better from a structural and manufacturing standpoint. These are interesting and lead to a better understanding of the things we have today and to speculation as to possible improvements.

This book is unique in that it has nothing to do with styles, periods and architectural designing. It is confined entirely to construction and the materials used in structures, which are the essential things in architecture. The author has been very painstaking in collecting these data and has assembled them in a very interesting and readable form. A reading tends to a better appreciation of the things we do today.

Londinium, Architecture and the Crafts, by William Richard Lethaby, F.R.I.B.A., Architect to the Dean and Chapter of Westminster. 248 *pages,* 175 *illustrations, cloth.* 5½x8½ *inches. D. Appleton and Company, New York City. Price* $5.00.

LINE *or* COLOR *in* ARCHITECTURE*

ALL architectural roads lead to Rome. The medieval styles may be traced back step by step to the city of the Emperors through the Romanesque just as modern manifestations have their origin in the more self-conscious copyings of the Renaissance, but whether the outgrowths of Romanesque or of the Renaissance be examined, the course of evolution has tended in our Northern buildings toward the substitution of the line for the mass and of shadow for color.

Already, in the days of ancient Rome, lines of moulding had been introduced, together with attached columns and dummy entablatures used as ornamental features on buildings whose actual support consisted of piers and arches, but the contrasting colors of the materials of construction, the great monolithic shafts of precious marbles or polished granite, the decorative sheeting of large surfaces with marble and vivid mosaic modified the effect of the superficial mesh of lines. The Greek simplicity of straightforward constructional expression had, indeed, been lost, but the ancient love of color remained to give a character to both the exterior and the interior of Roman buildings that could not have been created otherwise. Color was evidently considered to be of the very first importance, and enormous cost must have been incurred to provide the masses of porphyry and other precious colored material, which were carried immense distances over sea and land from quarries in remote parts of the Empire.

With the employment of color as an important element in architecture, a tradition as to the disposition of color masses existed to guide the designer, who could hardly fail to learn the rules of harmony from the multitude of examples which surrounded him on every side. The arts of decoration and of construction went hand in hand, both well understood and obviously put into execution with assured confidence even if the effects aimed at might appear to a modern critic somewhat coarsely magnificent rather than expressing the utmost possible refinement. The more barbarous and uncertain arts of the Romanesque period retain in their poorer and more meager fashion this respect of color, and often where the lack of funds forbade the employment of mouldings and attached columns in the Roman manner, the large surfaces covered in cloth hangings, such as the Bayeaux tapestry, or with designs executed in pigments, preserved something of the ancient tradition. Improvements in masoncraft and the invention of ribbed vaulting, however, weighed down the balance in favor of attention to lines as distinct from modelled masses or colored surface, and although traces of pigment are to be found on the great majority of untouched medieval works, the love of ribs and mouldings gained ground, and for a time overmastered every other consideration.

It was with minds filled with the Gothic tradition of ribs and panels, of lines of vaulting shafts and label moulds that the Northern designer turned to the consideration of the Renaissance of Roman architecture which had been exploited by the great Italian masters. And here, though the Gothic forms of details were to be cast off like so much old clothing, the manner in which the Renaissance came to the North tended to direct attention to the lines and proportions of Roman architecture rather than to its management of color masses. By the time Gothic art had run its course the majority of genuine Roman examples of color decoration which remained above ground had been subjected to the destructive influences of several centuries of exposure to weather, if not also to purposeful destruction either as pagan works, unworthy to be preserved, or for the sake of the value of their materials, and the students of the Renaissance could gain but an imperfect impression of the important place color had taken in the buildings when they were new. Still less could their diagrams and measured drawings, executed in line, convey color values to spectators in the North, who had their attention directed instead to the minute proportions of the columnar orders as they may be expressed in fractional parts of the diameter of a column. This was arid food for architects, and tended to leave them starving for lack of what should have been a necessary ingredient of their diet.

Color vanished from the exterior of buildings, and if it was retained in treatment of interiors it was applied not at the discretion of the architect but at the whim of the painter called in to adorn and finish his work. Even when, as in the case of Michelangelo, painter and architect were one, the architecture tended under this arrangement to become a frame for pictures rather than a living color scheme; and in the absence of a great master of both arts the question of color was left more or less to chance. Sir Christopher Wren, that magician in sculptured form, managed to knock some color sense into the module by marshalling the lights and shadows on the columns and intercolumniations of his portico into key with those on the more distant and more elevated mass of the dome and its encircling peristyle. But after he had painted this gigantic

*Reprinted from The Builder, of London.

chiaroscuro athwart the sky, and upheld it by half a hundred matchless spires, the color sense was painstakingly washed out of architecture once more by a return to classical correctness of detail and proportion.

The brothers Adam, Owen Jones, and Butterfield each in their own way, strove to reinstate color, but their efforts were those of individuals struggling against an overwhelming flood. Ruskin pleaded for color in architecture, and the last remnants of color tradition seem to have broken down at his words. It would be well if we could dismiss the subject as ancient history, but unfortunately architecture at the present time has not only to get on as best it may in the absence of adequate instruction, but to combat some pernicious influences of great, if disregarded, strength.

It may be fairly claimed that almost every architectural student is trained in his early years from line diagrams of the orders of classic architecture which fail to indicate the polychromatic decoration applied to ancient buildings. Far worse than this, many students are allowed to work from diagrams which represent one column and a fragment of entablature without reference to the appropriate intercolumniation or to the fact that the color value of a column is determined by reference to the relative dimensions of the whole assembly of units, the columns and entablature with their proper minor shadows in relation to the main bulk of shadowy intercolumniation enclosed in the more brilliantly lighted frame. From the time of the Renaissance to the present day the difference between the color value of a pilaster and of a column standing free with an ample loggia behind it has been involved in confusion owing to the fact that in an outline elevation such as is put before the student the two things appear identical, although intensely different in actual effect.

The misuse of conventional colors for tinting working drawings to distinguish different materials of construction is another stumbling block. Truth is sacrificed to an exaggeration purporting to lead to increased legibility and the young architect learns to accustom himself to looking without disgust at collections of the most discordant hues and tones provided in the paint box arranged upon the paper, not in reference to the effect of the resulting pattern, but in accordance with the quality or quantity of certain materials represented. Perhaps the most hopeful sign of a return to a realization of color values may be read into the domestic architecture designed and erected since the war under pressure of great economic stringency. Funds have not been available for the many functionless features of pre-war times, and simple, useful shapes have had perforce to be adopted. Under the circumstances architects were driven to consider the possibility of redeeming the plainness of their bare walls and unbroken roofs by the choice of pleasantly colored materials. It is to be hoped that when the enforced economy has passed, the value of color will not be neglected.

PREHISTORIC CAVES OF NAVAJO NATIONAL RESERVATION

OUR national monuments, which number twenty-nine, established by Presidential proclamation, are little known and exceedingly worth while visiting, the journey being adventurous and thrilling, states the Department of the Interior, which is issuing bulletins describing these historic landmarks.

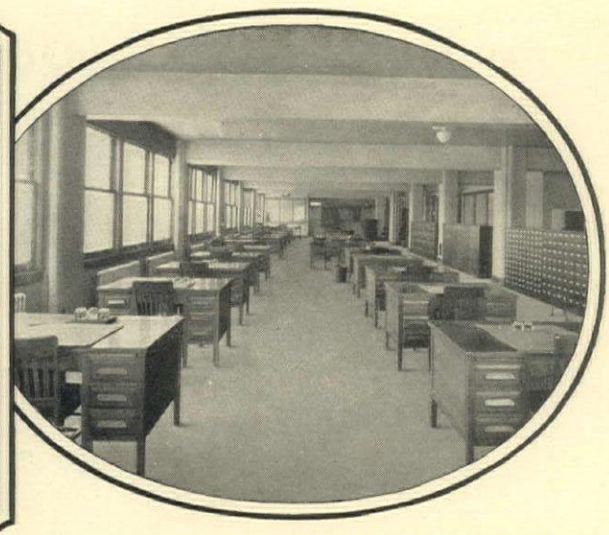
The Navajo Monument is within the Navajo Indian Reservation in Northeastern Arizona, and comprises three separate tracts of land, each of which contains the ruins of a remarkable prehistoric cave pueblo, or cliff dwelling, in a good state of preservation. These are known as Betatakin (the Navajo name of side-hill house), Kitsil (meaning broken pottery), and Inscription house. The latter ruin derives its name from an inscription scratched into the clay plaster of a wall which reads "Shapeiro Ano Dom 1661." It is thought that an early Spanish explorer or father probably on his way to or from the Colorado River must have entered the canyon in which this ruin is located and paused at the then long-abandoned pueblo to scratch a record of his visit. It was not again visited until June, 1909.

Betatakin is at an elevation of 7,000 feet, in a great cave 450 feet long with a maximum depth of 150 feet, in the side of a soft, red sandstone cliff which forms the walls of a picturesque canyon. The cave roof projects far out over the village, which originally contained 120 rooms and occupied every foot of building space, but is so high that swirling storms have caused shrubbery to grow up to the very foundations of the ancient homes. Within the cave itself is a never-failing spring of excellent water.

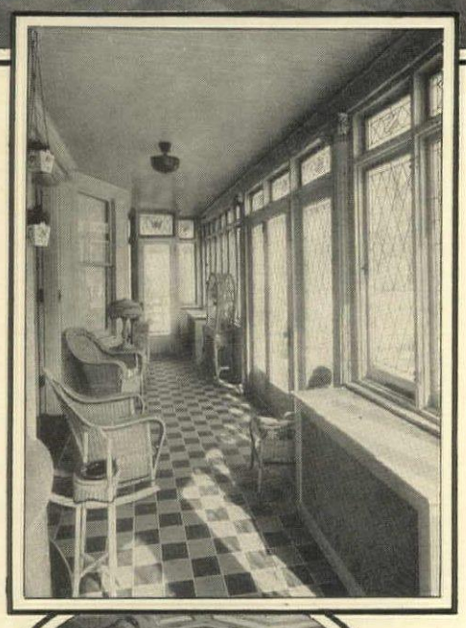
MODEL FARM FOR TURKEY

THE Turkish Government, realizing the benefits to the American farmers of Government experimental stations scattered throughout the United States, and in the further belief that similar governmental aid to agriculture would be desirable in Turkey, has recently appropriated a considerable sum of money for the establishment of a model farm similar to the agricultural stations in this country. This farm is to be located near the agricultural school at Adana, and special attention is to be given to the improvement of crops and increasing the production.

Above. Trading floor of the Cotton Exchange, N. Y. Donn Barber, architect. The floor of *Gold-Seal* Cork Tile insures the maximum of comfort and quiet.



In the R. L. Polk & Co. Building, Detroit, Richard Mair, architect, the *Gold-Seal* Battleship Linoleum floor is dignified, quiet, and serviceable.



Right. The colorful floor of *Gold-Seal* Treadlite Tile adds considerably to the cheer of this sun parlor, in the home of Mrs. D. Scheldon, Brooklyn, N. Y.

Suitable Floors

Architectural skill finds a fertile field for expression in the floors. Suitability, of course, is of first importance. Then, too, the right floor must be comfortable, quiet and durable. Bonded Floors embody these qualities to a surprising extent.

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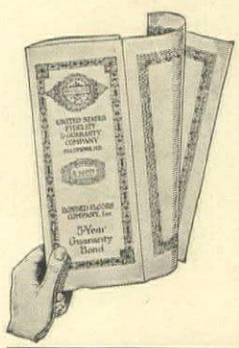
Literature descriptive of Bonded Floors, as well as specifications and details, will be gladly furnished on request.

Schrafft tea room, Boston, Mass. Chas. E. Bierge, architect. The sanitary floor of handsome *Gold-Seal* Marbleized Rubber Tile is in harmony with the decorative plan.



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A service arranged for the use of the Architect, Specification Writer and Architectural Engineer

This list of the more important business literature of Manufacturers of building material and equipment is published each issue. Any of these publications may be had without charge, unless otherwise noted, by applying to The American Architect and The Architectural Review, 243 West 39th Street, New York, or obtained directly from the manufacturers. Either the titles or the numbers may be used in ordering.

ACOUSTICS

Johns-Manville, Inc., 294 Madison Ave., New York, N. Y.

710. *Architectural Acoustics.* A treatise on the correction of architectural acoustics in churches, schools, hospitals, office buildings and other places. 24 pp. Ill. 6 x 9 in.

AIR CONDITIONING—See also Heating and Ventilation

The Bayley Manufacturing Company, 732-760 Greenbush St., Milwaukee, Wis.

486. *Bulletin No.* 23. This bulletin is descriptive of the Bayley Turbo-Atomizer, the Bayley Turbo Air-Washer and Air Conditioner, for cleaning, cooling, tempering, humidifying and dehumidifying air. It contains an interesting treatise on air conditioning methods together with useful tables and a set of specifications. 32 pp. Ill. 7¾ x 10½ in.

Midwest Air Filters, Inc., 100 E. 45th St., New York City.

642. *Dust Problems and Their Solution.* A discussion of the problems of supplying clean air for ventilation and industrial purposes, covering the complete line of Midwest Air Filters. Drawings, photographs, installations, sizes, specifications, tables, etc., make it a practical handbook on the subject for architects and specification writers. 48 pp. Ill. 8½ x 11 in.

ARCHITECTURAL IRON WORK—See also Ornamental Metal Work

ASBESTOS—See also Lumber, Roofing

Johns-Manville, Inc., 294 Madison Ave., New York, N. Y.

709. *Johns-Manville Service to Power Users.* A catalog containing valuable data on all forms of asbestos insulation, asbestos packings, steam traps, high temperature cements, asbestos brake blocks and linings, asbestos building materials and general technical data. 260 pp. Ill. 8½ x 11 in.

ASBESTOS ROOFING—See also Roofing

The Philip Carey Co., Lockland, Cincinnati, Ohio.

380. *Asbestos versus Fire.* Booklet in colors. Contains information about asbestos; data on Carey Prepared and Built-up Asbestos Roofing; picture of buildings on which they have been used. 15 pp. Ill. 6 x 9 in.

ASH HOISTS—See also Hoists

Gillis & Geoghegan, 545 West Broadway, New York, N. Y.

329. *General Catalogue.* Contains specifications in two forms, (1) using manufacturer's name, and (2) without using manufacturer's name. Detail in ¼ in. scale for each telescopic model and special material handling section. Fully illustrated with photographs of actual installations and descriptive matter of same. 20 pp. 2 colors. 8½ x 11 in.

BANK VAULTS

The Rivet-Grip Steel Co., 2735 Prospect Ave., Cleveland, O.

763. *Vault Security.* A booklet treating of the fundamentals of vault masonry design and illustrating the application of the Rivet-Grip system of reinforcement in concrete vault walls. Typical layouts, details and specifications 22 pp. Ill. 8½ x 11 in.

BATHROOM EQUIPMENT

A.P.W. Paper Co., Albany, N. Y.

740. *The Onliwon Hygiene.* A file card for reference in specifying cabinets of different kinds to contain toilet papers and paper towels. 2 pp. Ill. 8½ x 11 in.

BRICK

American Face Brick Association, 1754 People's Life Bldg., Chicago, Ill.

103. *The Story of Brick.* Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Size 7 x 9¼ in. 56 pp.

137. *A Manual of Face Brick Construction.* The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions are illustrated and described. Size 8½ x 11 in. 116 pp. Price $1.00.

155. *The Home of Beauty.* A booklet containing fifty prize designs for small brick houses submitted in national competition by architects. Texts by Aymar Embury II, Architect. Size 8 x 10 in. 72 pp. Price 50 cents.

371. *Architectural Details in Brickwork. Series One, Two and Three.* Each series consists of an indexed folder case to fit standard vertical letter fire, containing between 30 and 40 half-tones in brown ink on fine quality paper. These collections are inspiring aids to all designers. Sent free to architects who apply on their office stationery; to others, 50 cents for each series.

American Face Brick Association, 1754 People's Life Bldg., Chicago, Ill.

454. *Bungalow and Small House Plans.* Four booklets containing plans for attractive small brick houses, containing 3-4, 5, 6, and 7-8 rooms. 50 pp. Ill. 8½ x 11 in. 25 cents each, $1.00 for the set.

BRICK AND TILE—See also Brick

BUILDING CONSTRUCTION

Cement-Gun Company, Allentown, Pa.

563. *Report on Gunite Walls.* A report of fire tests made by Underwriters' Laboratories on Gunite walls, resulting in giving them a three-hour fire resistance classification. 90 pp. Ill. 6 x 9 in.

Concrete Engineering Co., Omaha, Neb.

347. *Handbook of Fireproof Construction.* An illustrated treatise on the design and construction of reinforced concrete floors with and without suspended ceilings. The Meyer Steel-form Construction is emphasized and tables are given of safe loads for ribbed concrete floors. 40 pp. Ill. 8½ x 11 in.

Curtis Companies Service Bureau, Clinton, Iowa.

662. *Better Built Houses.* Vol. XIII. This volume contains floor plans and perspectives of 21 two family houses. The designs were made by Trowbridge & Ackerman, Architects, New York, and illustrations rendered by Schell Lewis. Printed in sepia on heavy cream paper. Sent free to architects, east of the Rockies, requesting it on business stationery, otherwise price $1.00. 24 pp. Ill. 9 x 12 in.

Johns-Manville, Inc., New York City.

752. *Johns-Manville Service to Industry.* A complete catalog of Asbestos Roofings, Heat and Electric Insulations, Waterproofing, Industrial Flooring, etc. Complete details and specifications. Valuable reference book for architects. 260 pp. Ill. 8½ x 11 in.

McKeown Bros. Co., 21 East 40th St., New York, N. Y.

434. *Clear Floor Space.* A folder showing uses and advantages of McKeown "Lattis" and "Bowstring" long span wood roof trusses. 4 pp. Ill. 8½ x 11 in.

Portland Cement Association, 347 Madison Ave., New York City.

595. *Concrete Floors.—Proposed Standard Specifications of the American Concrete Institute.* Specifications with explanatory notes covering materials, proportions, mixing and curing. Plain and reinforced slabs are covered as well as one and two course floors and wearing courses. 18 pp. 6 x 9 in.

The Rivet-Grip Steel Co., 2735 Prospect Ave., Cleveland, O.

F809. *Rivet-Grip Steel Joists.* Circular describing fabricated steel joists of truss type made from specially rolled heavy Rivet-Grip sections. Details, designing tables and specifications. 8 pp. Ill. 8½ x 11 in.

Truscon Steel Company, Youngstown, Ohio.

317. *Truscon Floortyle Construction. Form D-352.* Contains complete data and illustrations of Floortyle installations. 16 pp. Ill. 8½ x 11 in.

318. *Truscon Standard Buildings. Form D-398.* Describes Truscon Standard Steel Buildings, with diagrams, illustrations of installations, descriptive matter and list of users. 48 pp. Ill. 8½ x 11 in.

319. *Truscon Building Products. Form D-376.* Contains a brief description of each of the Truscon Products. 112 pp. Ill. 8½ x 11 in.

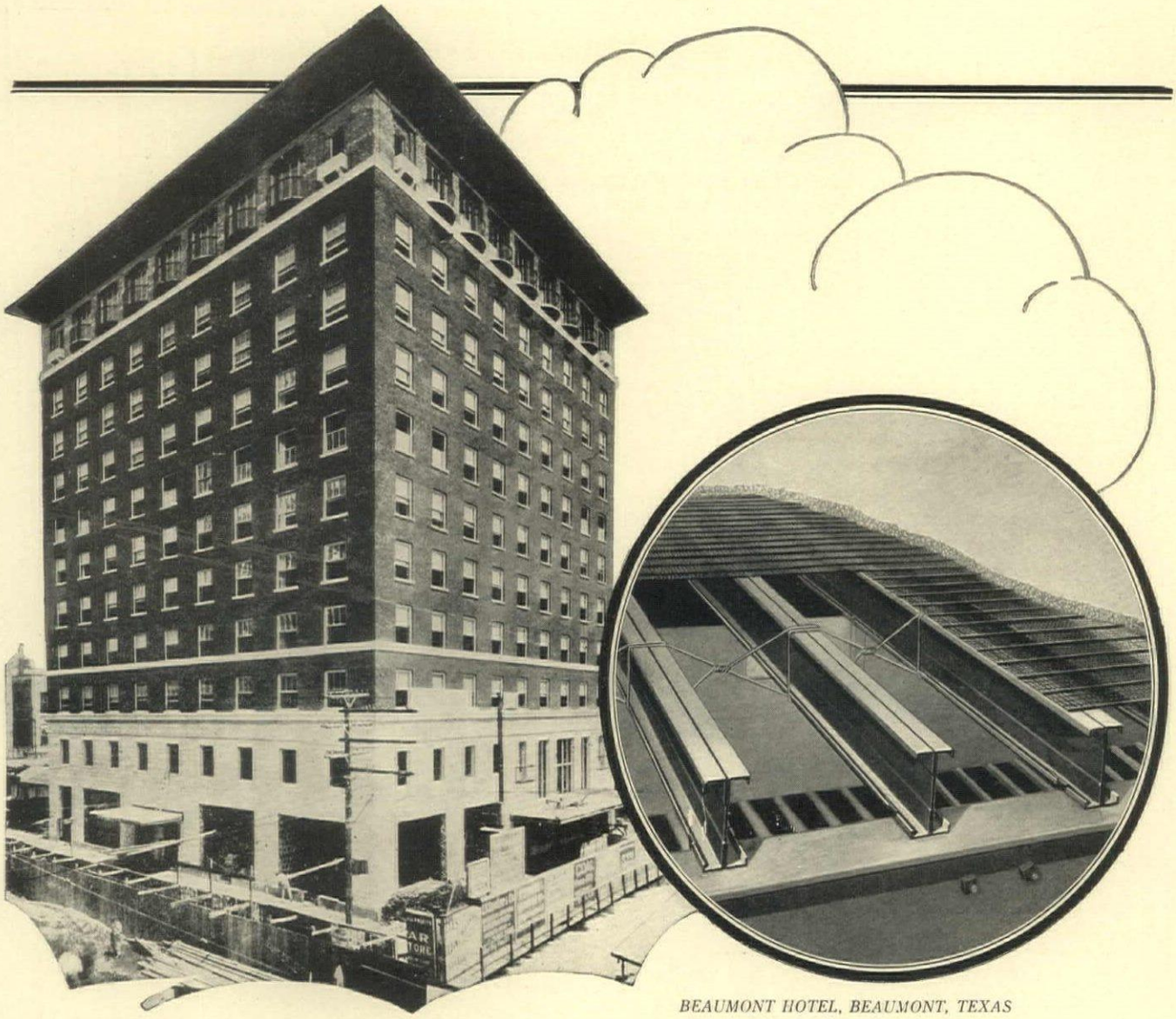
320. *Modern School Construction. Form D-396.* Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 16 pp. Ill. 8½ x 11 in.

BUILDING DIRECTORIES

The Tablet & Ticket Co., 1015 West Adams St., Chicago, Ill.

517. *Office Building Directory.* Bulletin illustrating and describing directories made by this company providing for any required number of names. Frames of wood or metal with glass cover or doors. Name strips with one-quarter inch white letters furnished. Size 7 x 10 in. 4 pp.

BUILDING HARDWARE—See Hardware



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BULLETIN BOARDS

R. W. Clark Mfg. Co., 1774 Wilson Ave., Chicago, Ill.

588. *Clark Directories and Clark Changeable Bulletin Boards.* Two pamphlets describing the Clark Changeable Bulletin Board and Directories for Office Buildings, Hotels, Business Buildings, etc. 8 pp. and 4 pp. Ill. 6¼ x 9 in.

The Tablet & Ticket Co., 1015-1021 West Adams Street, Chicago, Ill.

516. *T. & T. Changeable Bulletin Display Boards.* Describes Bulletin Boards with changeable type which has a self-spacing device so the lettering always looks neat and regular. 24 pp. Ill. 6 x 9 in.

CABINETS

Hess Warming & Ventilating Co., 1204-7 Tacoma Building, Chicago, Ill.

386. *The Hess Sanitary Medicine Cabinet Lockers and Mirrors.* Description with details of an enamelled steel medicine cabinet for bathrooms. 20 pp. Ill. 4 x 6.

CASEMENTS—See Doors and Windows

CEDAR LINING—See Lumber

CELLAR SASH—See Doors and Windows

CEMENT

The Carney Co., Mankato, Minn.

448. *The Bond That Guarantees the Wall.* Attractive catalog for architects, engineers, contractors, and dealers. Describes fully the characteristics, durability and economy of this nature-mixed cement that requires no lime. Contains simple formula for mixing and illustrations of Carney-laid buildings. 24 pp. Ill. 8½ x 11 in.

711. *A Perfected Cement.* An attractive circular describing late improvements in manufacturing Carney, cost comparisons, physical tests, specifications and testimonials. List of Carney-built buildings with architect's and contractor's names. 8 pp. Ill. 8½ x 11 in.

Louisville Cement Co., Inc., Louisville, Ky.

694. *Brixment for Perfect Mortar.* A description of the chemical and physical properties of Brixment, advantages of its use in mortars for brick and stone masonry, tests of strength and directions for use. In cover for filing. 16 pp. Ill. 8½ x 11 in.

Portland Cement Association, 111 West Washington St., Chicago, Ill.

636. *Concrete Data for Engineers and Architects.* A valuable booklet containing the reports of the Structural Materials Research Laboratories at Lewis Institute, Chicago, in abbreviated form. It is of great value to writers of specifications. 18 pp. Ill. 8½ x 11 in.

CHAIRS—See Furniture

The B. L. Marble Chair Co., Bedford, Ohio.

587. *Office Chairs, Catalog No.* 31. Describes a complete line of seating fixtures, for offices, directors' rooms and other places consisting of stationary and swivel chairs, settees and couches, both plain and leather upholstered. Also stenographer's chairs, stools, waste baskets, coat trees and accessories. 75 pp. Ill. 9 x 12 in.

CHUTES—See also Laundry Equipment

Edwin A. Jackson & Bro., Inc., 50 Beekman St., New York.

171. Booklet showing general construction and size of chutes to receive coal. Two types are built into the foundation wall with glass panel in place of cellar window; another type is placed flush with the ground, and is placed adjacent to wall, or can be placed near the street curb. Size 3½ x 6¼ in. 16 pp.

CLOCKS

Landis Engineering and Manufacturing Co., Waynesboro, Penna.

469. *Landis Electric Time and Program System.* A collection of bulletins No. 100, 110, 120, 130, 150, and 160, dealing with master and secondary clocks, equipment, time stamps, etc. Bound in expansible filing cover of tough paper. 48 pp. Ill. 8½ x 11 in.

COLUMNS

Lally Column Co. of New York, 334 Calyer Street, Brooklyn, N. Y.

122. *Lally Columns. Handbook.* Detailed construction diagrams for various types of steel construction. The text describes advantages of endurance and economy of the column. Various tests, tables of sizes, dimensions, weight, carrying capacities, and data on other structural materials are given. Size 4⅝ x 6⅜ in. 81 pages.

CONCRETE, REINFORCED—See also Reinforcing Steel

CONDUITS—See Pipe

DAMPPROOFING—See also Waterproofing

DOORS AND WINDOWS

Andersen Lumber Company, Bayport, Minn. (formerly South Stillwater).

559. *Complete Catalog for Architects and Builders.* Describes Andersen Standard Window Frames and Cellar Sash Frames, which are in 7 units instead of 57 and may be assembled and nailed in 10 minutes. Shows uses in special construction for it comes in 121 sizes and styles. 24 pp. Ill. 7¾ x 10¾ in.

Crittall Casement Window Co., Detroit, Mich.

672. *Crittall Universal Casement, Catalog No.* 22. Contains complete description, photographs, specifications and details of steel casement windows for banks, schools, residences, churches, hospitals, set directly into masonry and with auxiliary frames. 76 pp. Ill. 9 x 12 in.

695. *Crittall Solid Steel Reversible Windows, Catalog No.* 1-24. A catalog explaining the advantages of reversible metal windows for office buildings, schools, hospitals and other substantial buildings. Details of construction and specifications. 20 pp. Ill. 8½ x 11½ in.

Dahlstrom Metallic Door Co., Jamestown, N. Y.

674. *Architectural Catalog.* Illustrated catalog showing styles and types of Dahlstrom Standard Construction Hollow Metal Doors and Trim, Conduo-Base, etc. Also various types of frames, jamb construction and architectural shapes. 178 pp. Ill. 8½ x 11 in.. in loose leaf.

Irving Hamlin, 716 University Place, Evanston, Ill.

735. *The Evanston Sound-Proof Door.* A circular explaining the construction of a sound-proof door hermetically sealed against odors, dust, light, weather and air, especially adapted to music schools, hospitals, etc. 4 pp. 8½ x 11 in.

Henry Hope & Sons, 103 Park Ave., New York.

65. *Hope's Casements and Leaded Glass.* Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of residential and office types. Size 12¼ x 18½ in. 32 pp.

The Kinnear Manufacturing Company, Columbus, Ohio.

455. *Steel Rolling and Folding Doors and Shutters. Catalog No.* 52. This catalog is devoted to service doors adaptable to buildings of all classes, piers, factories, warehouses, etc. Illustrates their use and contains tables for designers and detailers. 96 pp. Ill. 8 x 11 in.

S. H. Pomeroy Company, 282 East 134th St., New York, N. Y.

614. *Solid Metal Double Hung Window. Type "A". Bulletin A.* Complete specifications and details of sash, frame, stools and stool and apron. 4 pp. Ill. 8½ x 11 in.

Truscon Steel Co., Youngstown, Ohio.

315. *Truscon Steel Sash.* A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill. 8½ x 11 in.

348. *Truscon Steel Sash.* This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.

638. *Daylighting Schools.* A treatise on the daylighting and window ventilation of school buildings quoting eminent authorities, illustrated with diagrams of lighting data and details of suitable windows. 28 pp. Ill. 8½ x 11 in.

The Wheeler Osgood Co., Tacoma, Wash.

713. *Laminex Doors, Catalog No.* 31. Doors made of Douglas Fir employing a special laminated and doweled construction. Twenty designs in vertical and flat grain veneers. Sizes and details. 44 pp. Ill. 3⅞ x 9¼ in.

714. *Laminex Doors, A Book for Architects and the Building Trade.* This book fully describes the special features of Douglas Fir Laminex and Woco Doors; strength, water and heat tests; properties of Fir; Woco garage doors and window sash. 24 pp. Ill. 8 x 11 in.

DRAFTING MATERIALS

American Lead Pencil Co., 220 Fifth Ave., New York, N. Y.

268. *Booklet C-20. Venus Pencil in Mechanical Drafting.* An interesting illustrated booklet showing the possibilities of the Venus Drawing Pencil for drafting. 6 x 9 in.

Joseph Dixon Crucible Company, Pencil Department, Jersey City, N. J.

325. *Finding Your Pencil.* A book explaining the various degrees of hardness of the Eldorado pencil and the grade most suitable for every man who uses a pencil be he business or professional man, clerk or draftsman. Accompanied by a color chart of Dixon colored crayons. 16 pp. and 4 pp. in color chart. Ill. in colors. 3¼ x 6 in.

Ruud Manufacturing Co., Pittsburgh, Pa.

732. *Ruud Delineator and Specification Card.* A diagram of vanishing lines over which perspective sketches can be readily and correctly made. 8½ x 11 in.

DRAINS—See also Plumbing Equipment

DUMB-WAITERS—See also Elevators

Kaestner & Hecht Co., 1500 No. Branch St., Chicago, Ill.

598. *Electric Dumb-waiters. Bulletin No.* 520. Illustrated catalog, 8 pp. 8½ x 11 in.

Sedgwick Machine Works, 144 West 15th Street, New York.

60. *Hand Power Elevator and Dumb-waiters in Modern Architectural Construction.* Illustrated catalogue. 4¼ x 8¼ in. 80 pp.

REFERENCE LIST OF BUSINESS LITERATURE—Continued

ELECTRICAL EQUIPMENT

Frank Adam Electric Co., St. Louis, Mo.

741. *Panel Board Catalog No.* 32. A complete catalog of standard panel boards, steel cabinets, switches and accessories. 48 pp. Ill. 7¾ x 10¾ in.

The Hart & Hegeman Mfg. Co., 342 Capitol Avenue, Hartford, Conn.

699. *H. & H. Electrical Wiring Devices, Catalog "R."* Catalog of a complete line of switches, sockets, plugs, receptacles, plates, rosettes, cut-outs, elexits and accessories. Two identical catalogs in two sizes. 152 pp. Ill. 5 x 6¼ and 8 x 10½ in.

700. *Gold and Silver Star Switches.* A new type of switch with composition base having a gold star or a silver luminous star in on the button. 4 pp. Ill. 3½ x 6 in.

Harvey Hubbell, Inc., Bridgeport, Conn.

297. *Electrical Specialties. Catalog No.* 17, 1921. This catalog contains descriptions with prices of the thousand and one items connected with electric light, electric alarm and small electric appliance installations in modern buildings. 104 pp. Ill. 8 x 10½ in.

Kohler Co., Kohler, Wis.

756. *Kohler Automatic Power and Light.* A catalog illustrating a complete line of isolated automatic electric plants of 800 to 2500 watts capacity operated by gas or gasolene. Specifications. 48 pp. Ill. 6 x 8½ in.

Minneapolis Heat Regulator Co., Minneapolis, Minn.

570. *The Minneapolis Thermostatic Relay Switch.* Used in connection with any Minneapolis Thermostat, provides a means of temperature control for automatic oil burners, electric refrigerating apparatus, electric heating units and any similar equipment where it is necessary to operate an electric switch in accordance with temperature changes. 4 pp. Ill. 8½ x 11 in.

National Metal Molding Co., Pittsburgh, Pa.

481. *Liberty Rubber Insulated Wires, Cables and Cords.* A descriptive catalog of insulated wires, cables and cords for electric wiring. Contains much special information together with useful tables. 20 pp. Ill. 6 x 9 in.

ELEVATORS—See also Dumb-waiters and Hoists

A. B. See Electric Elevator Co., 52 Vesey St., New York.

169. Photographs and description in detail of elevator equipment manufactured by the A. B. See Electric Elevator Co. Size 6 x 8 in.

Kaestner & Hecht Co., 1500 No. Branch St., Chicago, Ill.

597. *Electric Traction Elevators, Bulletin No.* 500. Illustrated catalog describing gearless traction elevators and worm-geared traction elevators. 31 pp. 8¼ x 11 in.

Kimball Bros., Co., Council Bluffs, Iowa.

742. *Kimball Straight Line Drive Elevators.* A complete catalog of passenger, freight and garage traction elevators, push button elevators, dumbwaiters, sidewalk and ash hoist elevators. 36 pp. Ill. 8½ x 11 in.

Otis Elevator Co., 260 Eleventh Ave., New York City.

651. *Otis Geared and Gearless Traction Elevators.* Leaflets describing all types of geared and gearless traction elevators with details of machines, motors and controllers for these types. Illustrated. 8½ x 11 in.

Richards-Wilcox Mfg. Co., Aurora, Ill.

335. *"Ideal" Elevator Door Equipment.* Catalog showing elevator door hangers for one, two and three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½ x 11 in.

ELEVATOR LOCKS

Elevator Locks Co., 119 No. Washington St., Peoria, Ill.

536. *M-C-K Safety Elevator Locks.* A description of locks for elevators which mechanically lock the power and gate automatically, while gate is open; keep power locked until gate is securely closed; securely lock gate before power can operate; control the landing. Contains several pages of names of contented users. 24 pp. Ill. 4 x 9¼ in.

ESCALATORS

Otis Elevator Co., 260 Eleventh Ave., New York City.

652. *Elevators and Inclined Elevators.* A comprehensive catalog illustrating the use of escalators for transporting people in stores, subways, railroad stations, theatres and mills; also inclined freight elevators for stores, factories, warehouses and docks adjustable to tide levels. 22 pp. Ill. 8½ in.

FENCE

The Stewart Iron Works Company, Cincinnati, Ohio.

456. *Book of Designs "B."* A book of fence designs full of suggestions for architects. All illustrations are from photographs. 80 pp. Ill. 9½ x 12 in.

FILTERS—See Air Filters

FINANCING OF ENTERPRISES

S. W. Straus & Co., 565 Fifth Ave., New York, N. Y.

183R. *The Straus Plan of Finance.* A book describing the methods of S. W. Straus & Co., in helping to finance the erection of the larger class of properties such as office and apartment buildings, hotels, loft buildings and similar structures. A book valuable to the architect who desires to study the business side of the profession. 24 pp. Ill. 7¼ x 10½ in.

S. W. Straus & Co., 565 Fifth Ave., New York, N. Y.

753. *What Forty-two Years Without Loss to Any Investor Means to You.* A booklet recording the record of S. W. Straus & Co., explaining the Straus Plan and reasons for its success. 16 pp. 4 x 6½ in.

FIRE DOORS AND SHUTTERS—See Doors and Windows

FIREPLACES AND MANTELS

Colonial Fireplace Co., 4619 Roosevelt Road, Chicago, Ill.

675. *Everything for the Fireplace.* A catalog showing a complete line of well designed andirons in various finishes; portable, club and basket grates; wood holders, firesets and Franklin stoves; folding screens, spark guards and fenders; hoods and set grates; gas logs, electric fires, ash traps, cranes and kettles and head throats and dampers. 24 pp. Ill. 8½ x 11 in.

H. W. Covert Co., 137 East 46th St., New York.

79. *Hints on Fireplace Construction.* Diagrams of construction and installation of Covert "Improved" and "Old Style" dampers and smoke-chambers, and other fireplace accessories. Size 5⅝ x 8½ in. 12 pp.

Edwin A. Jackson & Bro., Inc., 50 Beekman St., New York.

92. *Dampers, Chutes, Doors and Dumps.* Illustrated catalog. Equipment and appurtenances of various types, construction and installation, data, dimensions and prices.

Peerless Manufacturing Company, Inc., Louisville, Ky.

513. *The Lure of the Fireplace.* This booklet contains information and diagrams for the design and building of fireplaces, together with descriptions of modern domes and dampers so that a fireplace will work effectively at all times. Contains many illustrations of tasteful mantel designs. 24 pp. Ill. 5 x 7 in.

FLOOR COVERING—See Flooring

FLOORING, SUB—See also Stucco Base

FLOORING

Armstrong Cork Co., Linoleum Department, Lancaster, Pa.

222. *Business Floors.* A handy reference on floors for public and semi-public buildings, containing specimen specifications, directions for laying and other helpful data. Illustrated in color. 6 x 9 in.

223. *Armstrong's Linoleum Floors.* A handbook for architects, published in the file form (8½ x 11 in.) recommended by the American Institute of Architects. A technical treatise on Linoleum containing general information, tables of grades, gauges and weight, specimen specifications, and detailed directions for laying linoleum. Profusely illustrated in colors.

The Barber Asphalt Co., Philadelphia, Pa.

659. *Genasco Trinidad Lake Asphalt Mastic.* A book describing its manufacture, uses and methods of application, including application over old floors. Separate specifications for flooring, waterproofing and roofing uses. 34 pp. Ill. 6 x 9 in.

Bonded Floors Co., Inc., 1421 Chestnut St., Philadelphia, Pa.

717. *Hospital Floors.* Descriptions and advantages of using Gold-Seal Battleship Linoleum, Gold-Seal Treadlite Tile and Gold-Seal Rubber Tile in hospital construction, insuring durable, noiseless, sanitary and attractive floors. Illustrated part in color. 8 pp. Ill. 8 x 10¾ in.

719. *Linoleum.* A standard specification of the material, workmanship and guarantee, with valuable comments and suggestions. Also additional clauses for insertion in specifications for Masonry, Heating, etc., Navy Department specification for battleship linoleum and details of installation. 8 pp. Ill. 8½ x 11 in.

The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.

204. *The Perfect Floor.* Tells how to lay finish and care for Oak Flooring. 16 pp. 14 illus. 5⅛ x 7⅝ in.

The Marbleloid Co., 461 Eighth Ave., New York.

61. *The Universal Flooring for Modern Buildings.* Illustrated booklet. Describes uses and contains specifications for Marbleloid flooring, base, wainscoting, etc. Size 6¾ x 9¾ in. 32 pp.

Franklyn R. Muller, Inc., Waukegan, Ill.

242. *Asbestone Flooring Composition.* A book describing uses of and giving specifications and directions for Composition Flooring. Base. Wainscoting, etc. 8½ x 11 in. Ill.

The Rodd Co., Century Bldg., Pittsburgh, Pa.

688. *Redwood Block Floor Booklet.* A treatise on the advantages of Redwood Block Floors in factories, warehouses, hotels, office buildings, department stores, hospitals, etc. Details, dimensions and specifications for installing. 14 pp. Ill. 4 x 9 in.

FLOORS—See Building Construction

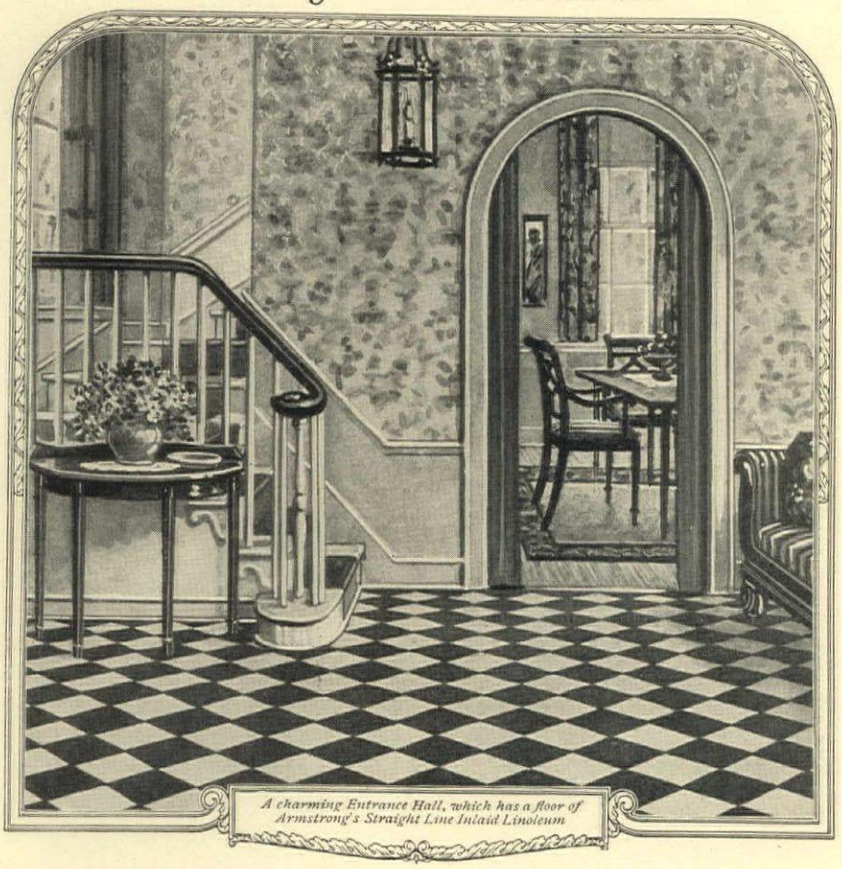
FRAMES—See Doors and Windows

FURNACES—See Heating

FURNITURE—See Chairs

Armstrong's Linoleum

for Every Floor in the House



A charming Entrance Hall, which has a floor of Armstrong's Straight Line Inlaid Linoleum

Look for the CIRCLE "A" *trademark on the burlap back*

Ⓐ

HOW TO USE A LINOLEUM FLOOR FOR EFFECT

HERE is a floor of modern linoleum. In this entrance hall, the floor of dull black and ivory squares shows most effectively the decorative possibilities in linoleum.

You are not limited, today, to the plain brown, gray, or green that you usually think of as linoleum, and which as "battleship" linoleum you specify for its quietness, resilience, and durability. Now, you can have designs and colorings in this quiet, easy-to-maintain floor material, in keeping with the latest word in decorative tendencies. These designs are manufactured in "inlaid" linoleum, in a variety of patterns and colorings that is equalled in few, if any, other types of floor materials.

The 6-inch black and ivory block pattern illustrated here is but one example. There are 12-inch, 9-inch, and 6-inch marbled block designs in blue and gray, green and gray, black and gray, reddish brown and cream; there are "inset tile inlaids" in which the design consists of 5½-inch blocks—for instance, blue, gray, red, green, and white, or black and gray, plain or marbled—separated by half-inch interliners of contrasting color. In "moulded" inlaids there are Dutch tiles, in which the effect of mortar lines is realistically and artistically carried out by the slight irregularity of the "moulded" lines of the design.

These modern designs in linoleum—nearly 200 distinct patterns and colorings in Armstrong's Inlaid Linoleum alone—can be made into distinctive, decorative floors. Skillful interior decorators are now using the new linoleum to add that needed touch of color and design to their floors to carry out the color schemes in complete harmony.

And a further important advantage in using linoleum is that it is inexpensive. A distinctly individual floor of Armstrong's Inlaid Linoleum can usually be installed at from 25 to 50 cents a square foot, a cost less by half or two thirds than the materials you usually think of for this purpose.

If you have not seen the new designs in Armstrong's Linoleum, and would also like to get an idea of what these modern floors will cost in your territory, simply write us, and the services of our Contract Department will be at your command. Ask especially for "Armstrong's Linoleum Floors," an 8½ x 11-inch book written solely for architects and containing specifications and other useful data.

Armstrong Cork Company, *Linoleum Division*, **Lancaster, Pa.**

A23

REFERENCE LIST OF BUSINESS LITERATURE—Continued

GARAGE CONSTRUCTION—See also Building Construction

GARBAGE DESTROYERS

Kerner Incinerator Company, 1029 Chestnut St., Milwaukee, Wis.

384. *The Sanitary Elimination of Household Waste, M-3 Folder.* Description of construction, installation and operation of the Kernerator for residences. Illustrated by views of residences in which the Kernerator is installed, with cuts showing all details. 15 pp. Ill. 4 x 9 in.

GARBAGE RECEIVERS

Edwin A. Jackson & Bro., Inc., 50 Beekman St., New York.

170. Booklet showing general construction and sizes of garbage receivers to be placed underground for suburban use; also types to be built into the wall of city homes and apartments; also types for suburban wall with opening on inside for the maid and outside for the garbage man. Size 3½ x 6¼ in. 16 pp.

GARDENS

Julius Roehrs Company, Rutherford, N. J.

406. The Ten-Ten books issued three times a year—covering nursery stock in general, such things as fruit trees, roses and perennials. Also one general greenhouse catalog, listing orchids and greenhouse plants.

GLASS

Plate Glass Manufacturers of America, First National Bank Bldg., Pittsburgh, Pa.

484. *The Part that Plate Glass Plays in the Life of Every Man.* An illustrated folder describing the many uses of plate glass. Ask also for special circular for work in hand. 6 pp. Ill. in color. 3½ x 6¼ in.

GRANITE—See Stone

GUNITE

Cement Gun Company, Allentown, Pa.

564. *The Cement Gun, Its Application and Uses.* Reprint of a paper by Byron C. Collier, C. Am. Soc. C. E. A description of what the cement gun is and how it works, together with reports on tests. 21 pp. Ill. 6 x 9 in. Ask also for companion pamphlet "Gunite Slabs" containing working tablets for designers and reports on slab tests. 30 pp. Ill. 6 x 9 in.

GUTTERS AND DOWNSPOUTS—See also Roofing

The New Jersey Zinc Co., 160 Front Street, New York, N. Y.

226. *Zinc Spouting.* Describes leaders, gutters, etc. "Made from Horse Head Zinc," giving information concerning their economy and durability. 8 pp. Ill. 6 x 9 in.

HARDWARE

Allith-Prouty Co., Danville, Illinois.

596. *General Catalog No.* 90. This catalog embraces a description of a complete line of door hangers and tracks, garage door hardware, spring hinges, rolling ladders, fire door hardware, overhead carriers, light hardware and hardware specialties. 144 pp. Ill. 7¾ x 10½ in.

The T. J. Callahan Co., Dayton, Ohio.

751. *Callahan Mechanical Sash Operators.* A catalog of sash operators for side wall or saw tooth windows in industrial establishments embodying new principles. Complete details and specifications. 22 pp. Ill. 7½ x 10½ in.

P. & F. Corbin, New Britain, Conn.

540. *Automatic Exit Fixtures.* A catalog of fixtures that provide a ready exit at all times, as a child can operate them with ease. Doors to which they are applied can always be opened from the inside, even when locked against entrance. 4 pp. Ill. 8¾ x 11¾ in.

547. *Locks and Builders' Hardware, Catalog No.* 26. A complete descriptive catalog of all kinds of builders' hardware. 483 pp. Ill. 9¼ x 12½ in. Cloth bound.

Monarch Metal Products Co., 5060 Penrose St., St. Louis, Mo.

438. *Monarch Casement Hardware.* A book describing hardware for casement windows. This Manual and folder comply with all suggestions made by the Structural Service Committee of the A. I. A. 18 pp. Ill. 7½ x 10½ in., in heavy folder for vertical file properly indexed.

Richards-Wilcox Mfg. Co., Aurora, Ill.

336. *Modern Hardware for Your Home.* Catalog of hangers for vanishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Slidtite" garage door hardware. 24 pp. Ill. 8½ x 11 in.

435. *Distinctive Garage Door Hardware. Catalog No. A-22.* This is more than a catalog. It is a treatise for architects and builders on the door equipment of garages, covering sliding, folding and combination sliding and folding doors, with their hardware. 94 pp. Ill. 8½ x 11 in.

632. *Distinctive Garage Door Hardware. Catalog A No.* 29. A complete treatise on garage doors of every kind both hand and mechanically operated with description of standard and special hardware and accessories. 66 pp. Ill. 8½ x 11 in.

Russell & Erwin Mfg. Co., New Britain, Conn.

609. *Russwin Period Hardware.* A brochure illustrating hardware trim in twelve architectural styles or periods. 71 pp. Ill. 5 x 8 in.

610. *Catalog of Hardware, Volume Fourteen.* A complete catalog of building hardware, trim, locks, butts and accessories. 359 pp. Ill. 8 x 11 in.

Sargent & Company, New Haven, Conn.

560. *Sargent Locks and Hardware for Architects.* The latest complete catalog of locks and hardware. 762 pp. Ill. 9 x 12 in.

The Stanley Works, New Britain, Conn.

11. *Wrought Hardware.* This catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 376 pp. Ill. 6½ x 9½ in.

12. *Garage Hardware, Booklet, illustrated.* Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and hand bolts, showing illustrations and text with dimensions of garages, describing the Stanley Works product. Size 6 x 9 in. 24 pp.

127. *The Stanley Works Ball Bearing Butts.* Booklet, illustrated. Description with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5 x 7½ in. 32 pp.

495. *Stanley Detail Manual.* A catalog in loose leaf binder, consisting of five sections on Butts, Bolts, Blinds and Shutter Hardware, Stanley Garage Hardware, Screen and Sash Hardware. Detail drawings are given, showing clearances and other data needed by detailers. 116 pp. Ill. 7½ x 10½ in.

Vonnegut Hardware Co., Indianapolis, Ind.

310. *Prince Self-Releasing Fire Exit Devices. Supplement to Von Duprin Catalog No.* 12. Contains valuable information for architects on the selection, detailing, etc., of Prince devices for doors and windows to insure safety against fire panic. 32 pp. Ill. 8 x 11 in.

747. *Von Duprin Self-Releasing Fire Exit Latches, Reference Book—No.* 240. A complete catalog with details of the working parts of these latches, handle bars, butts, door holders and accessories. Dimensions and installation directions. 96 pp. Ill. 8½ x 11 in.

HEATERS—See Water Heaters

HEATING

American Radiator Company, 104-108 W. 42nd St., New York, N. Y.

427. *Ideal-Arcola Heating Outfit.* A book describing a system of hot water heating for small and medium size houses. The boiler is placed in a room and resembles a stove. No cellar required. The ash carrying reduced to a minimum. 24 pp. Ill. 6 x 8½ in.

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

211. *Steam Catalogue.* A book containing full descriptions of the complete line of Crane valves, fittings, etc. 800 pp. Ill. 6 x 9 in.

The Duriron Co., Inc., Dayton, Ohio.

720. *Acid Fume Exhaust Fans.* A specification for exhaust fans where corrosive fumes or vapors are to be removed from chemical hoods, laboratories, etc. 4 pp. Ill. 8½ x 11 in.

C. A. Dunham Co., 230 East Ohio St., Chicago, Ill.

755. *The Dunham Heating Service Bulletins.* Bulletin No. 101, Radiator Traps; 103, Medium Pressure Traps; 104, Packless Radiator Valves; 105, Oil Separators and Suction Strainers; 106, Reducing Pressure Valves and Vacuum Pump Governors; 107, Air Line Valves; 108, Home Heating System; 110, Vacuum Heating System; 111, Installing Home Heating System. Ill. 8 x 11 in.

The Farquhar Furnace Company, Wilmington, Ohio.

355. *Healthful Helpful Hints.* A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Ill. 4¾ x 9¼ in.

356. *A Plain Presentation to Dealers.* A book of selling talk for dealers in Farquhar Furnaces. Four model heating layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Ill. 8½ x 11 in.

General Boilers Company, Waukegan, Ill.

444. *Catalog No.* 7 A catalog completely describing the construction and operation of Pacific Steel Boilers. Contains also specifications and price lists. 32 pp. Ill. 6 x 9 in.

The Hart & Cooley Co., New Britain, Conn.

712. *Wrought Steel Registers and Grilles, Catalog No.* 24. A catalog of wrought steel floor, baseboard and wall registers, cold air intakes, lock registers, ventilators, furnace regulators and accessories. Dimensions, details and price lists. 80 pp. Ill. 7¾ x 10 in.

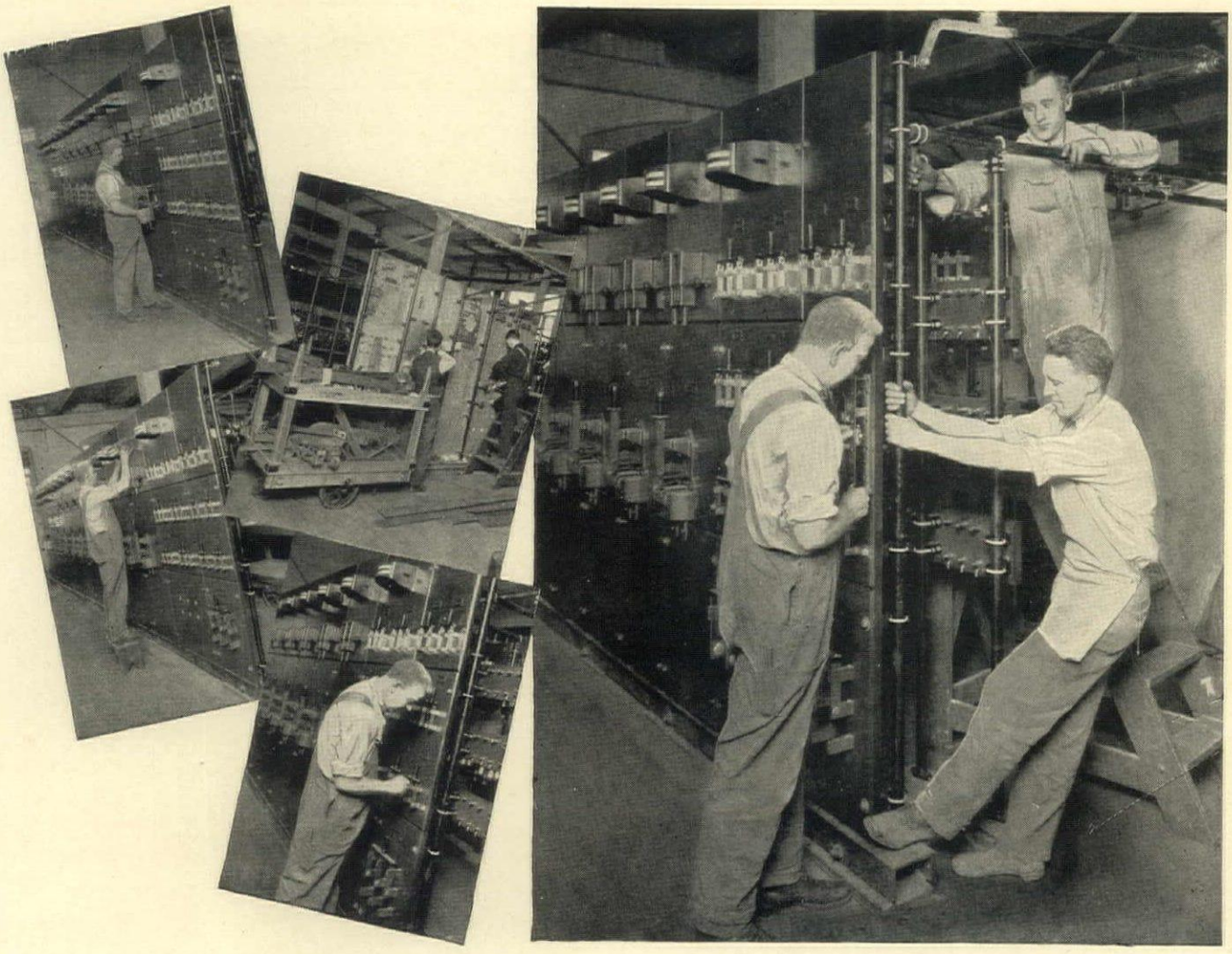
Hess Warming and Ventilating Co., 1209 Tacoma Bldg., Chicago, Ill.

178. *Modern Furnace Heating.* An illustrated book on the Hess Welded Steel Furnaces. Pipe and Pipeless, notes for installation, sectional views, showing parts and operation, dimensions, register designs, pipes and fittings. Size 6 x 9½ in. 48 pp.

Hoffman Specialty Co., Inc., Waterbury, Conn.

745. *The Heat Thief.* A booklet describing the economic advantages of the Hoffman No. 2 Vacuum Valves applied to a one-pipe steam heating system. 16 pp. Ill. 5½ x 7½ in.

746. *Controlled Heat.* A booklet describing the advantages of controlled heat effected by the use of Hoffman Modulating Inlet Valves, Hoffman Return Line Valves and the Hoffman Differential Loop. 28 pp. Ill. 5½ x 7½ in.



Switchboard Assembly

Assembly in Switchboards means the accumulation of finished products and their mounting upon panels or framework to form a complete switchboard.

G-E Switchboard Assemblers are artisans, who not only know the products they handle but also know the functioning of these products. The result of such assembly is obvious. Every device mounted upon a switchboard is adjusted with respect to its successful operation after installation. The completed board must then be inspected and approved by competent engineers who are versed in the requirements of the purchaser, both for design and installation.

Only in this way can the Architect be assured of a product complying with his specifications and properly fitting into his structure.

This is the seventh installment of the story of building quality switchboards. Next month we shall tell you something about switchboard devices. We trust that this series merits a place in your file 31c2 and shall be glad to send you any numbers necessary to complete it.

General Electric Company
Schenectady, N. Y.

54C-88

GENERAL ELECTRIC

Specifications of most products advertised in THE AMERICAN ARCHITECT appear in the Specification Manual

REFERENCE LIST OF BUSINESS LITERATURE—Continued

HEATING

Illinois Engineering Co., Racine Ave., at 21st St., Chicago, Ill.

501. *Illinois Heating Systems. Vapor Details Bulletin* 20. This bulletin contains typical plans and elevations of heating systems, with description of details and "Standards for Comp'ing Radiation and Boiler Sizes" of the Chicago Master Steam Fitters' Association. 18 pp. Ill. 8 x 10¾ in.

502. *Illinois Bulletins.* No. 102 contains detailed description with capacities and dimensions of Eclipse Pressure Reducing Valves. 20 pp. Ill. Nos. 202, 302, 452, 502 and 703 describe, with illustrations, Steam Specialties, Back Pressure Valves, Stop and Check Valves, Exhaust Heads, Balanced Valves, Separators, Steam Traps.

Jenkins Bros., 30 White St., New York, N. Y.

235. *Catalog No.* 12. This catalog contains descriptions of all the valves, packing, etc., manufactured by Jenkins Bros. Includes also dimensions and price lists of valves and parts. 271 pp. Ill. 4 x 6¾ in. Stiff paper cover.

Johnson Service Company, 149 Michigan St., Milwaukee, Wis.

391. *The Regulation of Temperature and Humidity.* A description of the Johnson System of temperature regulation and humidity control for buildings; showing many kinds of thermostatic appliances for automatically maintaining uniform temperatures. 63 pp. Ill. ½ x 11 in.

392. *Johnson Electric Thermostat, Valves and Controllers.* A catalog of devices mentioned in the title. 24 pp. Ill. 3½ x 6 in.

Kewanee Boiler Co., Kewanee, Illinois.

574. *Fire Box Boilers, Catalog No.* 76. A description of smokeless steel firebox boilers with complete data of capacities and dimensions of the brick set and portable types. 35 pp. Ill. 6 x 9 in.

575. *Power Boilers, Catalog No.* 73. A complete description of brick set horizontal tubular power boilers with full and half-front setting. Also smokeless tubular boilers with down draft furnace and steel casing. Also steel portable locomotive boilers, grates, breechings, cast iron fronts, air receivers, storage tanks and accessories. 3 5pp. Ill. 6 x 9 in.

Minneapolis Heat Regulator Co., Minneapolis, Minn.

660. *Minneapolis Dual Control.* This circular describes in detail the No. 65 Hydrostat and No. 70 Pressurestat and their application for the automatic heat control of hot water, steam or vapor systems. 12 pp. Ill. 3¼ x 6 in.

The Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.

722. *Powers Temperature Regulation.* A catalog explaining the principles of thermostatic control of temperature and its application to heating plants. Details of apparatus and applications, installations in important buildings and engineering data. 40 pp. Ill. 8 x 11 in.

723. *Thermosttic Water Controller, Bulletin No.* 124. Describing water temperature control apparatus adapted to shower and tub baths, lavatories and other places where predetermined water temperature is desired. Details of installation, capacities, dimensions and prices. 4 pp. Ill. 6⅜ x 9¼ in.

724. *The No.* 11 *Regulator, Bulletin No.* 129. Describing a self contained, accurate regulator of liquid temperature in hot water service tanks, steam cookers, pasteurizers, etc. Details, dimensions and prices. 2 pp. Ill. 6¾ x 9¼ in.

Richardson & Boynton Co., New York, N. Y., Chicago, Ill., Philadelphia, Pa., Providence, R. I., Boston, Mass.

290. *The Richardson Vapor Vacuum-Pressure Heating System.* An interesting book which presents in clear non-technical language the principles of Vapor-Vacuum-Pressure heating; the economy over ordinary steam heating, steam and hot-water systems may be altered to use this principle with views of buildings where the V-V-P system is installed. 14 pp. Ill. 8 x 11 in.

291. *Perfect Warm Air Furnaces.* No. 203. Contains a full description of various types of warm air furnaces and parts, with dimensions and necessary data. 24 pp. Ill. 8 x 10½ in.

292. *Perfect Cooking Ranges.* Description and dimensions of the complete line of the new high enamel finish Richardson Perfect ranges, with charts and information regarding combination coal and gas cooking ranges. 40 pp. Ill. 8½ x 11 in.

Skinner Bros. Manufacturing Co., 1474 So. Vandeventer Ave., St. Louis, Mo.

761. *Skinner Bros., (Baetz Patent) Heating System.* A catalog illustrating the construction and installation of encased heating units for circulating and re-heating in industrial plants of all kinds. 24 pp. Ill. 7¾ x 10½ in.

762. *Direct Fired Heating Systems.* A catalog describing a direct fired heating unit with fan attached used in theatres, armories and industrial plants. 16 pp. Ill. 7¾ x 10½ in.

Thatcher Furnace Co., 131-135 West 35th St., New York City.

748. *Thatcher Boilers and Thatcher Furnaces.* Catalog describing a series of cast iron steam and hot water heating boilers and also one describing a series of cast iron warm air heaters. Accessories, details and dimensions. 80 pp. and 24 pp. Ill. 4½ x 7½ and 8½ x 11 in.

Tuttle & Bailey Mfg. Co., 2 West 45th St., New York, N. Y.

396. *Special Designs. Catalog* 66A. A book of designs for grilles, screens, registers and ventilators to be used in connection with heating installations. Made of bronze, brass, iron and steel. 40 pp. Ill. 6¾ x 9¾ in.

Utica Heater Company, Utica, N. Y.

557. *Utica Imperial Super-Smokeless Boilers.* These boilers burn all fuels and consume soft coal without smoke. The illustrated catalog contains complete technical data with lists of illustrations. 76 pp. Ill. 8½ x 11 in. (Separate bulletins may be had featuring the following buildings: Schools, Churches, Public Buildings, Apartments, Hotels, Residences, Industrial Buildings, Offices and Theatres.)

558. *Warm Air Heating.* A folder featuring warm air heating equipment including *New Idea* pipeless furnaces. Superior pipe furnaces and *Super-Smokeless* furnaces for burning soft coal.

HEATING AND VENTILATION

American Blower Co., Detroit, Mich.

362. *General Catalog "ABC" Products.* A book full of useful data for all men who have to deal with heating and ventilating problems. 132 pp. Ill. 8½ x 11 in.

Buffalo Forge Co., 490 Broadway, Buffalo, N. Y.

215. *Buffalo Fan System of Heating, Ventilating and Humidifying.* Catalog 700. This contains a general discussion of heating and ventilating under four heads. Part 1, Public Buildings. Part 2, Industrial Plants. Part 3, Buffalo Apparatus. Part 4, Fan Engineering.

Garden City Fan Co., McCormick Bldg., Chicago, Ill.

673. *New Sectional Catalog No.* 200. Describing the latest improved cycloidal multivane fans for heating, ventilating and drying, also standard steel plate fans and pipe coil heaters. Details, capacity tables and specifications. 24 pp. Ill. 7½ x 10½ in.

The H. W. Nelson Corporation (formerly Moline Heat), Moline, Ill.

411. *Univent Ventilation. Architects' and Engineers' Edition.* A scientific treatise on ventilation for schools, offices and similar buildings; with 40 pages of engineering data on ventilation for architects and engineers. 72 pp. Also "Supplement A" on Air Conditioning. 12 pp. Ill. with half-tones, line drawings and designing charts. 8½ x 11 in.

HOISTS—See Elevators and Ash Hoists

INCINERATORS—See Garbage Destroyers

INSULATION—See also Stucco Base

The Celotex Co., 111 W. Washington St., Chicago, Ill.

701. *Celotex Insulating Lumber.* An insulating material made from cane fibre in form of board of various lengths and thicknesses. Specifications, physical properties and tests. Several catalogs, booklets and leaflets.

Insulite Co., 1100 Builders Exchange Bldg., Minneapolis, Minn.

487. *Universal Insulite in Building Construction.* Describes a clean, sanitary, odorless and vermin proof board made from selected waterproofed wood fibres, felted into light, strong, uniform sheets. Examples are given for use indoors and outdoors together with details and useful data. 37 pp. Ill. 8½ x 11 in.

United States Mineral Wool Co., 280 Madison Ave., New York.

83. *The Uses of Mineral Wool in Architecture.* Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fireproofing, with section drawings and specifications for use. It gives rule for estimate and cost. Size 5¼ x 6⅝ in. 24 pp.

IRON AND STEEL—See also Metals

The American Rolling Mill Co., Middletown, Ohio.

658. *The Story of Commercially Pure Iron.* A most interesting booklet recounting the historical development of iron and its present day manufacture in commercially pure, durable form. 48 pp. Ill. 6 x 9 in.

682. *What's Under the Galvanized Coating?* A booklet describing the process of galvanizing, its protective service and also the necessity for pure iron as a basis for galvanizing. 16 pp. Ill. 3¼ x 6¼ in.

KITCHEN EQUIPMENT—See also Stoves

Bramhall, Deane Co., 261-A West 36th St., New York.

59. *The Heart of the Home.* Booklet, illustrated. Deane's French Ranges (all fuels), cook's tables and plate warmers. Size 6 x 9 in. 32 pp.

LATH, METAL

American Steel & Wire Co., Chicago, Ill.

228. *Stucco Houses Reinforced With Triangle Mesh Fabric.* A pamphlet containing valuable data on stucco work with tables of qualities of material and many illustrations of houses covered with stucco applied on Triangle Mesh Fabric. 24 pp. Ill. 6 x 9 in.

FERROCRAFT GRILLES

TUTTLE & BAILEY MFG CO.

Makers of Ferrocraft Metal Grilles
For Over 75 Years

36 Portland St.
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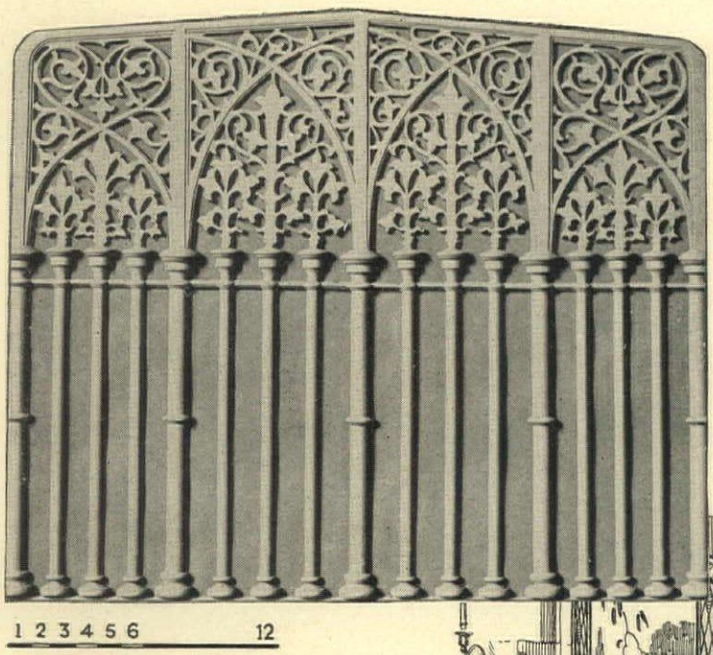
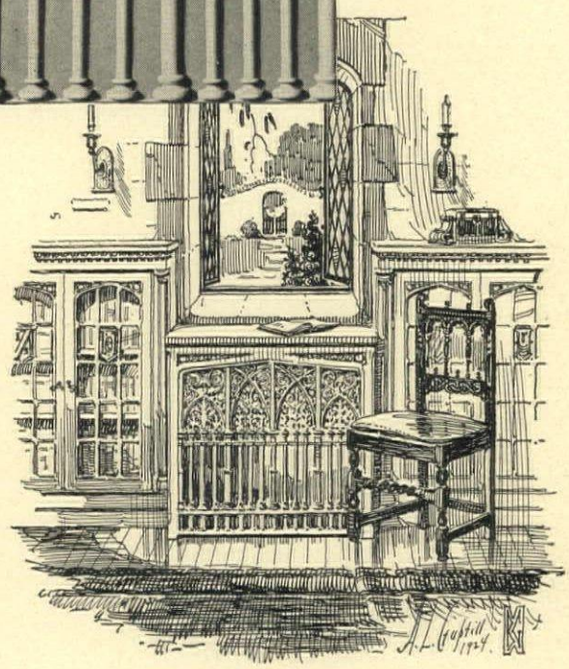


Tudor-Gothic design number 170



When Rood Screen Pointed The Design

WASN'T it Washington Irving, who when standing for the first time before Westminster Cathedral, paid it such a wonderful tribute in the two words which he murmured: "Crystalized history"?

To England's Old Cathedrals it was, that one of our famed architects made pilgrimages when seeking motifs for a country house reminiscent of Tudor and Gothic. In one of them he found a choice motif in a Rood screen, which was adapted to the Ferrocraft Grilles enclosing the radiators. That design pattern and 499 others we have in our vaults, available for your adaptations. Their rendering into Ferrocraft Grilles is the work of master craftsmen, who painstakingly hand-chase and sharpen the details.

Do not confuse these grilles with the usual so-called "ornamental iron castings."

REFERENCE LIST OF BUSINESS LITERATURE—Continued

LATH, METAL

Concrete Engineering Co., Omaha, Neb.

346. *How to Use Ceco Lathing Materials.* An illustrated treatise on the use of expanded metal lath. Contains construction details and complete specifications, with sample piece of lath in pocket on cover of book. 16 pp. Ill. 8½ x 11 in.

Truscon Steel Company, Youngstown, Ohio.

316. *Hy-Rib and Metal Lath.* Tables, general data and illustrations of Hy-rib and metal lath construction. 6 pp. Ill. 8½ x 11 in.

LAUNDRY EQUIPMENT

Chicago Dryer Co., 2210 No. Crawford Ave., Chicago, Ill.

66. *Laundry Appliances.* Illustrated catalog. Descriptions of Laundry Dryers, Electric Washing Machines and Ironing Machines, especially adapted for use in residences, apartment buildings and small institutions. Size 8½ x 11 in. 48 pp.

The Pfaudler Company, Rochester, N. Y.

581. *Glass Lined Steel Laundry Chute.* Catalog describing a glass lined steel laundry chute with flushing ring at top and drain connection at bottom, specifications, dimensions and details adapted to hospitals and hotels. 14 pp. Ill. 5⅛ x 7⅜ in.

LIGHTING—See also Electrical Equipment

Frank Adam Electric Co., 3649 Belll Ave., St. Louis, Mo.

629. *The Control of Lighting in Theatres.* A book describing means for complete control of lighting the stage, auditorium, and other parts of the theatres with distribution schedules and specifications. Also applications of control to Masonic buildings, schools and colleges. 32 pp. Ill. 8 x 11 in.

Cooper Hewitt Electric Company, 95 River Street, Hoboken, N. J.

553. *Industrial Lighting Briefs.* No. 1 deals with Industrial Lighting in theory and practice. No. 2 deals with the engineering of illumination with Cooper Hewitt Lamps. No. 3 deals with the quickness of response of the Hand to Eye. Each 4 pp. 8 x 10½ in.

E. Erikson Electric Co., 6 Portland St., Boston, Mass.

613. *Erikson Reflectors, Catalog No.* 90. Description of and details of installing reflectors in show windows, display cases, art galleries, rug racks, banks, churches, and other buildings. 32 pp. Ill. 6¼ x 9½ in.

I. P. Frink, Inc., 24th St. and 10th Ave., New York.

150. *Light Service for Hospitals. Catalogue* 421. A booklet illustrated with photographs and drawings, showing the types of light for use in hospitals, as operating table reflectors, linolite and multilite concentrators, ward reflectors, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses. Size 7 x 10 in. 12 pp.

218. *Picture Lighting. Booklet* 422. A pamphlet describing Frink Reflectors for lighting pictures, art galleries, decorated ceilings, cove lighting, the lighting of stained glass, etc., and containing a list of private and public galleries using Frink Reflectors. 24 pp. Ill. 5¼ x 7 in.

219. *Frink Reflectors and Lighting Specialties for Stores. Catalog No.* 424. A catalog containing a description of the Frink Lighting System for Stores; the Synthetic System of Window Illumination; and a number of appliances to produce the most effective lighting of displayed objects. 20 pp. Ill. 8 x 11 in.

220. *Frink Lighting Service for Banks and Insurance Companies. Reflectors. Catalog No.* 425. A very interesting treatise on the lighting of offices; with details of illustrations and description of lamps and reflectors. Contains a list, covering several pages of banks using Frink Desk and Screen Fixtures. 36 pp. Ill. 8¼ x 11 in.

Harvey Hubbell, Inc., Bridgeport, Conn.

401. *Hubbell Flush Door Receptacles.* Description of a safe, convenient and practical wall outlet de luxe for fine residences, clubs, hotels, public buildings and offices. 4 pp. Ill. 8 x 10 in.

LIME

The Ohio Hydrate & Supply Co., Woodville, Ohio.

494. *A Job That Took a Million Years.* A description of how limestone is formed and how it is later converted into lime. All the processes are shown in detail and the uses of lime are illustrated. 16 pp. Ill. 8½ x 11 in.

LINCRUSTA-WALTON—See also Wall Covering

The Lincrusta-Walton Company, Hackensack, N. J.

519. *Lincrusta-Walton.* This book gives directions for buying caring for and applying Lincrusta-Walton; together with color chart and many pages showing patterns. 67 pp. 8½ x 11 in. Ill. Bound in boards.

LOCKERS, STEEL—See Factory Equipment

LUMBER

E. L. Bruce Co., Memphis, Tenn.

533. *Now the Cedar Clothes Closet.* A book illustrated in colors describing "Bruce Cedaline" for lining clothes closets as a complete protection against moths. 12 pp. Ill. 4¼ x 6 in.

The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.

203. *From Tree to Trade.* This book tells the story of the manufacture of lumber. Gives an idea of the scope of the business and the care and attention given to the manufacture and grading of Long-Bell trade-marked products. 100 illustrations. 48 pp. 8½ x 11 in.

The Mahogany Assn., Inc., 1133 Broadway, New York City.

729. *Historic Mahogany.* A monograph devoted to furniture designed by Chippendale, Hepplewhite, Sheraton and Early American styles. 16 pp. Ill. 5½ x 8 in.

The Pacific Lumber Company of Illinois, 2060 McCormick Bldg., Chicago, Ill.

363. *Construction Digest*—The use of California Redwood in residential and industrial construction. Contains illustrations, grading rules, specifications and other technical data for architects and builders. 16 pp. Ill. 8½ x 11 in.

364. *Engineering Digest*—The use of California Redwood in industrial construction and equipment for factories, railroads, mines and engineering projects. 16 pp. Ill. 8½ x 11 in.

MAIL CHUTES

Cutler Mail Chute Co., Rochester N. Y.

294. *The Cutler Mail Chute. Model F.* Describes the Cutler Mail Chute in its standard form, known as Model F. Contains data for rough floor openings not included in the Mail Chute contract. 16 pp. Ill. 4 x 9¼ in.

MANTELS

Edwin A. Jackson & Bro., Inc., 50 Beekman St., New York.

90. *Wood Mantels. Portfolio.* Wood mantel designs of various types and openings, giving dimensions, projections and showing fireplace grate designs. Size 9 x 6¼ in. 32 pp.

MARBLE—See Stone

Appalachian Marble Co., Knoxville, Tenn.

715. *Appalachian Tennessee Marble.* A series of six colored plates, description of physical properties, standard sizes of floor tile, specifications for laying floor tiles and for erecting base, wainscoting, bank screens and other standing work. Standard filing folder. 23 pp. Ill. 8½ x 11¼ in.

The Georgia Marble Co., Tate, Pickens Co., Ga., New York Office, 1328 Broadway.

634. *Why Georgia Marble is Better.* Booklet 3⅜ x 6 in. Gives analysis, physical qualities, comparison of absorption with granites, opinions of authorities, etc.

METAL MOLDINGS

National Metal Molding Co., Pittsburgh, Pa.

152. *Handbook for the Man on the Job.* An illustrated book of fittings and methods with description and instructions for installing National Metal Molding under all conditions; a book meant to be conveniently carried and used on the job. Size 4⅜ x 6 in. 102 pp.

METALS—See also Iron and Steel—Roofing

American Brass Co., Main Office, Waterbury, Conn.

138. *Price List and Data Book.* Illustrated. Looseleaf Catalog. Covers entire line of Sheets, Wire Rods, Tubes, etc., in various metals. Useful tables. Size 3⅞ x 7 in. 168 pp.

385. *Copper Products.* Illustrated price list and tables of weights. Covers copper for roofing purposes, including strip copper for forming into leaders, gutters, valleys, flashings, etc. 64 pp.

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.

452. *Reference Book. Pocket Edition.* Covers the complete line of Sheet and Tin Mill Products. 168 pp. Ill. 2½ x 4½ in.

Bridgeport Brass Co., Bridgeport, Conn.

483. *Seven Centuries of Brass Making.* A brief history of the ancient art of brass making and its early (and even recent) method of production—contrasted with that of the Electric Furnace Process—covering tubular, rod and ornamental shapes. 80 pp. Ill. 8 x 10½ in.

Rome Brass & Copper Company, Rome, N. Y.

473. *Price List No.* 70. A loose-leaf binder containing full price list of Rome Quality products, together with useful tables. 5⅛ x 7¼ in.

MILLWORK—See also Lumber—Building Construction—Doors and Windows

MORTAR—See also Cement

Louisville Cement Company, Inc., Louisville, Ky.

311. *Brixment, the Perfect Mortar.* The reading of this little book gives one a feeling that definite valuable information has been acquired about one of the oldest building materials. Modern science has given the mason a strong water-resisting mortar with the desirable "feel" of the best rich lime mortar. 16 pp. Ill. in colors. 5½ x 7¾ in.

MORTAR COLORS—See also Paints, Stains, Varnish

Ricketson Mineral Paint Works, Milwaukee, Wis.

376. *Ricketson Mortar Colors.* Two interesting folders with color card for these well known fadeless mortar colors in use for 35 years. 3¼ x 6 in.

PAINTS, STAINS, VARNISHES—See also Waterproofing

Samuel Cabot, Inc., 141 Milk St., Boston, Mass.

341. *Cabot's Old Virginia White and Tints.* Describes a specially prepared "flat" white which architects say gives "the whitewash white effect." Also describes tints perfectly flat in tone giving the "pastel effect." Used on wood, brick, stone, and stucco. 16 pp. Ill. 4 x 8½ in.

Specifications of most products advertised in THE AMERICAN ARCHITECT appear in the Specification Manual

REFERENCE LIST OF BUSINESS LITERATURE—Continued

PAINTS, STAINS AND VARNISHES

Joseph Dixon Crucible Co., Jersey City, N. J.

324. *Dixon's Silica-Graphite Paint.* A pamphlet describing the physical properties of silica-graphite paint and especially the wide difference between it and other protective paints. Contains also sample color card with specifications. 20 pp. and 6 pp. in color card. Ill. 3¼ x 6¼ in.

National Lead Company, 111 Broadway, New York, N. Y.

389. *Color Harmony.* Color card for glass finish and flat finish together with useful notes on painting and a collection of approximate formulas for obtaining the colors shown on the color card. 8 pp. Ill. 3⅜ x 8½ in.

708. *Early American Architecture.* An attractive portfolio of selected sketches and measured drawings showing Colonial and Georgian design containing 34 plates, 8¼ x 10¾ in. Suggested color schemes are included.

The New Jersey Zinc Co., 160 Front St., New York, N. Y.

227. *Painting Specifications.* A booklet full of useful information concerning paint mixtures for application on various surfaces.

Ripolin Co., The, Cleveland, Ohio.

419. *Ripolin Specification Book.* 8 x 10¼ in., 12 pp. Complete architectural specifications and general instructions for the application of Ripolin, the original Holland Enamel Paint. Directions for the proper finishing of wood, metal, plaster, concrete, brick and other surfaces, both interior and exterior, are included in this Specification Book.

Pratt & Lambert, Inc., Buffalo, N. Y.

759. *Specification Manual for Painting, Varnishing and Enameling.* Complete specifications for painting, varnishing and enameling interior and exterior wood, plaster and metal work. 38 pp. 8½ x 11 in.

Standard Varnish Works, 443 Fourth Ave., New York, N. Y.

566. *Architectural Reference Book, Third Edition.* A readily accessible and concise compilation of practical finishing information from which specifications readily can be written on varnishes, stains, fillers and enamels. 24 pp. Ill. in colors with samples on wood, etc. 8½ x 11 in.

PILES, CONCRETE

Raymond Concrete Pile Co., 140 Cedar St., New York.

156. *Raymond Concrete Piles—Special Concrete Work.* A booklet with data concerning the scope of the Raymond Concrete Pile Co., for special concrete work. It classifies piles, showing by illustration, text and drawings, the relative value of special shape and manufacture of piles. It gives formulæ for working loads, and relative economy. Size 8½ x 11⅛ in. 60 pp.

PIPE—See also Metals

Bridgeport Brass Company, Bridgeport, Conn.

556. *Brass Pipe and Piping; When and How it Should be Used. Bulletin No.* 15. This book contains valuable tables, charts and examples for the design of hot water installations, with illustrations of details and connections. It also discusses the use of pipe of different materials; various processes for preventing rust and corrosion in iron and steel pipes. It is a valuable treatise for all architects and engineers. 47 pp. Ill. 8 x 10½ in.

A. M. Byers Company, Pittsburgh, Pa.

679. *What is Wrought Iron?* Bulletin 26-A. Contains the definition of wrought iron, methods of manufacture, chemical and physical characteristics; advantages of wrought iron as a pipe material; service records from old buildings equipped with Byers Genuine Wrought Iron Pipe. How to tell the difference between iron and steel pipe. 40 pp. Ill. 8 x 10¾ in.

680. *The Installation Cost of Pipe,* Bulletin 38. Contains cost analysis of a variety of plumbing, heating, power and industrial systems, with notes on corrosive effects in different kinds of service. 32 pp. Ill. 8 x 10¾ in.

The Duriron Co., Dayton, Ohio.

730. *Duriron Acid-Proof Building Equipment, Bulletin No.* 134. This bulletin contains reports of corrosion tests and details and specifications for installing acid-proof drainage equipment, sinks, etc. 20 pp. Ill. 8 x 10½ in.

758. *Duriron Acid-Proof Building Equipment, Bulletin No.* 134. An architect's handbook describing the advantages of Duriron material in contact with corrosive liquids and fumes. Details and dimensions of drainage pipes and fittings and acid-proof exhaust fans and ducts. 24 pp. Ill. 8½ x 11 in.

National Tube Co., Frick Bldg., Pittsburgh, Pa.

670. *National Bulletin No.* 25B. *Third Edition.* Devoted to the installation of steel pipe in large buildings, architectural anti-corrosion engineering, gas piping, specificatons, and tables of strength and properties. 74 pp. Ill. 8½ x 10¾ in.

Rome Brass and Copper Company, Rome, N. Y.

509. *Bulletin No.* 1. *Seamless Brass Pipe.* This bulletin illustrates in colors nine installations of hot water heaters between range boiler, basement furnace, tank and instantaneous heaters for one and two-family houses and larger buildings. Contains also a number of estimating and designing tables, rules and formulas. 22 pp. Ill. 7½ x 11¾ in.

A. Wyckoff & Sons Co., Elmira, N. Y.

397. *Wyckoff Wood Pipe. Catalog No.* 42. A description of machine-made woodstave pipe and Wyckoff's express steam pipe casing. Contains also a number of pages of useful formulas and tables for hydraulic computation. 92 pp. Ill. 6 x 9 in.

PIPE COVERING

The Philip Carey Co., Lockland, Cincinnati, Ohio

379. *Pipe and Boiler Coverings. Catalog* 1362. A catalog and manual pipe and boiler coverings, cements, etc. Contains a number of valuable diagrams and tables. 71 pp. Ill. 6 x 9 in.

PLUMBING EQUIPMENT—See also Drains

Bridgeport Brass Co., Bridgeport, Conn.

461. *Plumbing Supplies.* Catalog of adjustable swivel traps; basin and bath supplies and waste; basin and sink plugs; low tank bends; iron pipe sizes of brass pipe. 20 pp. Ill. 8 x 10½ in.

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

240. *General Plumbing Catalogue.* A very complete and well illustrated booklet describing the complete line of Crane plumbing goods. 80 pp. 8½ x 11 in.

Philip Haas Co., Dayton, Ohio.

750. *Haas Universal Flush Valve.* Insert for Catalog "B." A catalog explaining the operation of this flush valve, details, roughing-in dimensions and application to various types of closets. 20 pp. Ill. 6 x 9 in.

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

236. *Jenkins Valves for Plumbing Service.* This booklet contains all necessary information about Jenkins Valves commonly used in plumbing work. 16 pp. Ill. 4¼ x 7¼ in. Stiff paper cover.

Kohler Company, Kohler, Wisconsin.

209. *"Kohler of Kohler."* A booklet on enameled plumbing ware describing processes of manufacture and cataloging staple baths, lavatories, kitchen sinks, slop sinks, laundry trays, closet combinations. 48 pp. Ill. 5⅛ x 8 in. Roughing-in Measurement Sheets 5 x 8 in.

531. *Catalog F.* This is a complete catalog of Kohler enamelled ware for plumbing installations, together with high grade fittings. There is also a brief and interesting description of the manufacture of high grade enamelled ware and a statement of the facts about Kohler village, one of the discussed experiments in modern industrial town building. 215 pp. Cloth bound. Ill. 7½ x 10⅜ in.

Thomas Maddock's Sons Company, Trenton, N. J.

696. *Vitreous China Plumbing Fixtures.* A valuable and complete catalog of vitreous china lavatories, drinking fountains, and laundry trays, also seats, faucets, bathroom fixtures and bidets, water closets, urinals, slop sinks, bathtubs, kitchen sinks accessories. Completely illustrated with roughing in diagrams. 242 pp. Ill. 8 x 11 in.

259. *General Catalog.* Contains complete description of the full line of fixtures styled the "Highest Grade Standardized Plumbing Fixtures for Every Need." 94 pp. Ill. 5 x 7½ in.

260. *Specifications for Plumbing Fixtures.* Contains tables of specifications for industrial buildings, schools, apartments, hotels, etc. 8 pp. Ill. 9 x 12 in.

PLUMBING—See also Drains

H. J. M. Howard Mfg. Co., 148 Pierce St., Washington, D. C.

F835. *Fire Hose Equipment.* Catalogs of swinging hose racks, siamese valves, valves, nozzles, hose cabinets and specifications. Three catalogs in box. 6½ x 9½ in.

Speakman Company, Wilmington, Del.

691. *Speakman Showers and Fixtures, Catalog H.* A complete catalog treating of everything pertaining to the mixing and control of water used in all kinds of shower and tub baths, lavatories and sinks, also strainers, drains and traps. Complete roughing-in measurements are included. A valuable catalog. 20 pp. Ill. 4½ x 7½ in.

The Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.

725. *The Powers Shower Mixer, Bulletin No.* 154. Description and details of a shower bath mixer that insures uniform water temperature regardless of disturbance of initial water pressure. 4 pp. Ill. 6⅜ x 9¼ in.

The Vulcan Brass Manufacturing Co., Cleveland, Ohio.

678. *Paragon Brass Goods, Catalog C.* New catalog showing sectional drawings, illustrations and text describing exclusive feature of "Paragon" self closing basin and sink faucets and stops; high pressure ball cocks, vitreous china bubblers, compression and quick-compression work. 60 pp. Ill. 7½ x 10½ in.

PUMPS

The Dayton Pump and Manufacturing Company, Dayton, Ohio.

475. *Electric House Pumps and Water Supply Systems.* A heavy paper binder containing illustrated bulletins 8½ x 11 in. These bulletins describe pumps as well as complete automatic electric and gasoline water supply systems and all accessories, together with specifications, detail drawings and tables of dimensions. 48 pp.

The Goulds Mfg. Co., Seneca Falls, N. Y.

387. *Power Pump Bulletins.* There are 22 of these bulletins treating on piston, plunger, air pressure, vacuum, triplex and centrifugal pumps. Bulletin 112 and Bulletin 122 containing the theory of pumps together with power pump data are of especial value to engineers in the offices of architects. 16 to 36 pp. Ill. 8 x 10 in.

REFERENCE LIST OF BUSINESS LITERATURE—Continued

REFRIGERATION

The Automatic Refrigerating Co., Hartford, Conn.

298. *The Mechanics of Automatic Refrigeration and Automatic Refrigeration for Hospitals and Sanatoriums.* Two essential booklets for the library of designers and specification writers. 24 and 28 pp. Ill. 8½ x 11 in.

370. *Automatic Refrigeration for Retail Markets.* A valuable treatise on the subject matter mentioned in the title. 30 pp. Ill. 8½ x 11 in.

Baker Ice Machine Co., Inc., Omaha, Nebraska.

661. *Baker System Refrigeration.* A catalog explaining the application of refrigeration for hotels, hospitals, institutions and restaurants requiring up to 50 tons daily capacity including mechanical details and specifications. 20 pp. Ill. 9 x 12 in.

Jamison Cold Storage Door Co., Hagerstown, Md.

569. *Heavy Duty Cold Storage Doors. Catalog No.* 10. Complete description of both hinged and sliding cold storage doors for every equipment. Also description of cold storage windows and ice chutes. 79 pp. Ill. 5¾ x 9 in.

REFRIGERATORS

Delco-Light Company, Division of General Motors Corp., Dayton, Ohio.

510. *Frigidaire. Important Facts for Architects and Builders.* Frigidaire is an electric refrigerator for houses and apartments. This book describes the construction, installation and operation of this convenient refrigerator. 16 pp. Ill. 8 x 11 in.

The Jewett Refrigerator Company, 27 Chandler Street, Buffalo, N. Y.

655. *Manual of Refrigerators.* This manual completely describes the construction of refrigerators for use in hotels, clubs, hospitals, institutions and residences, with specifications. Numerous plans showing size and arrangement of refrigerators in kitchens, service and lunch rooms are included. 30 pp. Ill. 8½ x 11 in.

698. *Jewett Solid Porcelain Refrigerators.* This improved refrigerator has an interior finish of one-piece solid porcelain ware for both food and ice compartments. Complete line with dimensions, types and prices. 22 pp. Ill. 8¼ x 11 in.

McCray Refrigerator Co., Kendallville, Ind.

472. *Refrigerators and Cooling Rooms. Cat.* 53. A catalog of cooling equipment for hotels, restaurants, hospitals, institutions, colleges and clubs. Catalog No. 96 deals with refrigerators for residences. 52 pp. each. Ill. in colors. 7½ x 10 in.

REINFORCING STEEL—See also Concrete, Reinforced

Rail Steel Products Association, Reinforcing Bar Division, Arcade Bldg., St. Louis, Mo.

582. *Rail Steel for Concrete Reinforcing.* A book describing the manufacturing, fabrication and physical properties of re-rolled billet and rail steel bars with specifications for their use. 84 pp. Ill. 8½ x 11 in.

RESTAURANT EQUIPMENT—See Kitchen Equipment

ROOF CONSTRUCTION

Porete Mfg. Co., 2 Verona Ave., Newark, N. J.

258. *Porete Roof Decks* An illustrated circular describing Porete (a new light-weight concrete) for use in fireproof roofs for all buildings. 4 pp.

ROOFING—See also Slate—Metals—Shingles

American Brass Company, Main Office, Waterbury, Conn.

515. *Copper Roofing. Service Sheet.* This service sheet contains details for laying copper roofing together with standard specifications. 17 x 22 in. folding to 8½ x 11 in., printed both sides.

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.

463. *Copper—its Effect Upon Steel for Roofing Tin.* Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy. 28 pp. Ill. 8½ x 11 in.

The Barber Asphalt Company, Land Title Bldg., Philadelphia, Pa.

422. *Standard Trinidad Built-up Roofing Specifications.* Contains two specifications for applying a built-up roof over boards and two for applying over concrete. Gives quantities of materials and useful data. 8 pp. 8 x 10½ in. Ask at same time for Good Roof Guide Book. 32 pp. Ill. 6 x 9 in.

702. *Specifications.* A pamphlet containing standard specifications for Genasco Standard Trinidad Lake Asphalt Built-up Roofing, Genasco Economy Trinidad Lake Asphalt Built-up Roofing, Genasco Membrane Waterproofing and Genasco Asphalt Flooring. Illustrated with sketches showing construction. 16 pp. Ill. 8 x 11½ in.

The Philip Carey Co., Lockland, Cincinnati, Ohio.

378. *Architects' Specification Book on Built-up Roofing.* A manual for detailers and specification writers. Contains complete details and specifications for each type of Carey Asphalt Built-up Roof. 20 pp. Ill. 8½ x 11 in.

The Edwards Manufacturing Company, Cincinnati, Ohio.

535. *Shingles and Spanish Tile of Copper.* This book, illustrated in colors, describes the forms, sizes, weights and methods of application of roof coverings, gutters, downspouts, etc., of copper. 16 pp. Ill. in special indexed folder for letter size vertical files.

Ludowici-Celadon Co., Chicago, Ill.

120. *Roofing Tile.* A detailed Reference for Architects' Use. Sheets of detailed construction drawings to scale of tile sections of various types and dimensions, giving notes of their uses and positions for various conditions of architectural necessity. Size 9½ x 13½ in. 106 plates.

154. *The Roof Beautiful.* Booklet. Well illustrated with photographs and drawings, giving history and origin of roofing tile, and advantages over other forms of roofing. Types shown by detailed illustrations. Size 8 x 10¼ in. 32 pp.

The Richardson Company, Lockland, Cincinnati, Ohio.

492. *Viskalt Membrane Roofs.* Contains specifications for applying Membrane roof over boards and also for applying over concrete. Illustrated with line drawings of several approved methods of flashings. 3 pp. 8½ x 11 in.

Rising and Nelson Slate Company, 101 Park Ave., New York, N. Y.

496. *Tudor Stone Roofs.* This leaflet discusses colors and sizes of Tudor hand-wrought slates; deals with the service given to architects and tells how the material is quarried for each product after careful drawings and specifications are prepared in co-operation with architects. Special grades are described in detail and illustrations are given of buildings with Tudor slate roofs. Contains also specifications of laying slate. 4 pp. Ill. 8½ x 11 in.

571. *Tudor Stone Roofs.* A brochure describing the 7 special grades of Tudor Stone and the 7 grades of commercial slate produced by this company with illustrations of many structures on which it has been used. 28 pp. Ill. 6 x 9½ in.

Vendor Slate Co., Easton, Pa.

333. Occasional brochures on architecturally pertinent phases of roofing slate sent on request. See also listing under Slate.

ROOF-LIGHTS—See Glass Construction

SAFETY TREADS

American Abrasive Metals Co., 50 Church St., New York City.

736. *Feralun Anti-Slip Treads.* Six plates of details of anti-slip stair treads, door saddles, elevator door sills, floor plates, trench covers and garage ramps. Plates can be traced or blue printed. Also data sheet of sizes, thickness and specifications. 7 pp. Ill. 8½ x 11 in.

SANDSTONE—See Stone

SASH—See Doors and Windows

SASH CHAIN AND CORD

Samson Cordage Works, Boston, Mass.

586. *Samson Sash Cord.* Specifications and condensed descriptions of Samson spot window sash cords, Samson mahogany wire center sash cord and accessories. 24 pp. Ill. 3½ x 6¼ in.

SCREENS

American Wire Fabrics Company, 208 So. La Salle St., Chicago, Illinois.

305. *Catalog of Screen Wire Cloth.* A catalog and price list of screen wire cloth, black enamelled, galvanized, aluminoid, copper, bronze. 30 pp. Ill. 3½ x 6¼ in.

The Higgin Manufacturing Co., 5th and Washington Ave., Newport, Ky.

353. *Screen your Home in the Higgin Way.* A description of Higgin door and window screens with practical data. 16 pp. Ill. 8½ x 11½ in.

New Jersey Wire Cloth Company, 614 South Broad St., Trenton, N. J.

409. *A Matter of Health and Comfort. Booklet No.* 2331. *A* booklet telling all about screens, the durability of copper and its superiority over all other metals for screen purposes. 16 pp. Ill. 5 x 7¾ in.

SHINGLES—See also Roofing

The Philip Carey Co., Lockland, Cincinnati, Ohio.

381. *Carey Asfaltslate Shingles.* Folder containing illustrations of attractive buildings and residences on which Carey Asfaltslate Shingles have been used. Describes this type of shingle, showing its special claims and advantages.

SIDEWALK LIGHTS—See also Vault Lights

SLATE—See also Roofing

Vendor Slate Co., Inc., Easton, Pa.

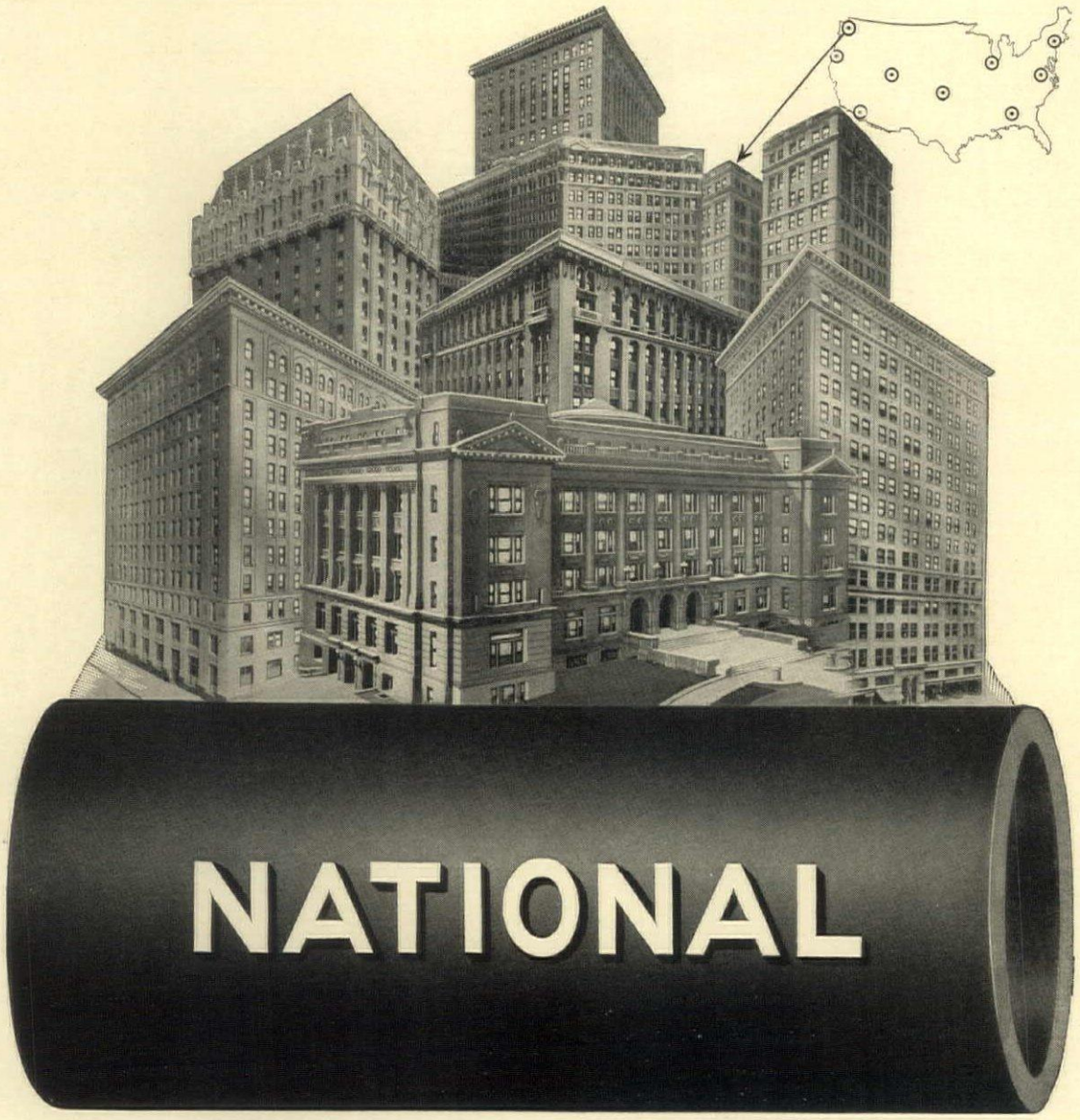
332. *The Vendor Book of Roofing Slate for Architects.* Contains original information on slate in various architectural uses; history, geology, sundry practical matters; complete descriptive classification; extended treatise on architectural roof design and specifications. 24 pp. Ill. 8½ x 11 in.

STAINS—See also Paints, Stains, Varnishes

STAIRWAYS—MOVABLE

The Bessler Movable Stairway Co., Akron, Ohio.

541. *The Modern Way Up.* A book describing a stairway that helps utilize attic space. It folds up in the ceiling and is concealed when not in use. Letters are given from contented users. 24 pp. Ill. 4¾ x 7¾ in.



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REFERENCE LIST OF BUSINESS LITERATURE—Continued

STEEL JOIST CONSTRUCTION

Truscon Steel Co., Youngstown, Ohio.

641. *Truscon Steel Joist Data Book.* Complete data of steel joists giving properties, dimensions, safe loads, coefficients of deflection, details of connections, specifications, directions for installations. 32 pp. Ill. 8½ x 11 in.

SOUND DEADENING

Hydrex Asphalt Products Corp., 120 Liberty St., New York City.

757. *Sound Deadening and Insulation.* Illustrated pamphlet. Describes Hydrex "Saniflor" and gives specifications for use under floors, in partitions and under roofs.

STONE

The Appalachian Marble Company, Knoxville, Tenn.

503. *Appalachian Tennessee Marble.* A new booklet on the qualities to be demanded in marble and a treatise on Tennessee marble by T. Nelson Dale (Retired Geologist, U.S.G.S.). Contains also illustrations of the plant of the company, buildings in which Appalachian Tennessee Marble has been used and four-color process plates of the six major Appalachian marbles. In tough paper indexed cover. 12 pp. Ill. 8½ x 11 in.

Indiana Limestone Quarrymen's Assn., P. O. Box 503, Bedford, Ind.

265. *Folders, Series D.* Structural detail and data sheets showing methods of detailing cut stone work in connection with modern building construction. 4 pp. each. 8½ x 11 in.

366. *Standard Specifications for Cut Stone Work.* This is Vol. III, Series "A-3," Service publications on Indiana Limestone, containing Specifications and Supplementary Data, relating to best methods of specifying and using this stone for all building purposes. This valuable work is not for general distribution. It can be obtained only from a Field Representative of the Association or through direct request from architect written on his letterhead. 56 pp. Ill. 8½ x 11 in.

693. *Indiana Limestone Homes, Series B, Vol.* 5. A portfolio containing sixteen designs for small and moderate-sized dwellings of different styles of architecture and sizes of lots. Plot plan, floor plans, perspective and description. Free to architects and draftsmen requesting same on employer's business stationery. 84 pp. Ill. 8½ x 11 in.

National Building Granite Quarries Assn., Inc., 31 State Street, Boston, Mass.

416. *Architectural Granite No.* 1 *of the Granite Series.* This booklet contains descriptions of various granites used for building purposes; surface finishes and how obtained; profiles of moldings and how to estimate cost, typical details; complete specifications and 19 plates in colors of granite from various quarries. 16 pp. Ill. 8½ x 11 in.

STORE FRONTS

Detroit Show Case Co., Detroit, Mich.

77. *Designs.* A booklet. Store fronts and display window designs, giving plans and elevations, and descriptions. Size 9¼ x 12 in. 16 pp.

78. *Details.* Sheets of full size details of "Desco" awning transom bar covers, sill covers, side, head and jamb covers, ventilated hollow metal sash and profile of members. Size 16 x 21½ in. 3 sheets.

STOVES

New Process Stove Co., Division of American Stove Co., 4301 Perkins Ave., Cleveland, Ohio.

457. *Catalog No. 148.* A complete catalog of gas ranges from a single cover hot plate to the most elaborate hotel range. Also lists gas heaters for rooms. 110 pp. Ill. 7 x 10 in.

Reliable Stove Company, Division of American Stove Co., Cleveland, Ohio.

460. *Reliable Angleiron Gas Ranges.* A pamphlet illustrating hot plates, laundry stoves and a complete line of gas cooking stoves and ranges equipped with the Lorain Oven Heat Regulator. 8 pp. Ill. 8 x 11 in.

STUCCO—See also Cement

Portland Cement Association, 347 Madison Ave., N. Y. C.

594. *Portland Cement Stucco.* Illustrated leaflet of recommended practice for Portland Cement Stucco. Contains data on materials, proportions, application and curing. Table of colors for various tints, photographs of surface textures and drawings of construction details also given. 15 pp. Ill. 8½ x 11 in.

STUCCO BASE

The Bishopric Manufacturing Company, Cincinnati, Ohio.

451. *Bishopric for All Time and Clime.* A booklet describing Bishopric materials; giving building data, detailed drawings and specifications. Illustrated with half tones from photographs of houses built of Bishopric materials. 52 pp. Ill. 8 x 10½ in.

TELEPHONES

Automatic Electric Co., 945 W. Van Buren St., Chicago, Ill.

683. *Architect's Specifications for Interior Telephone System.* A complete and short specification for the installation of interior telephone systems adapted to all kinds of buildings and uses. 4 pp. 8½ x 11 in.

684. *The Straight Line.* A booklet devoted to interior communication by use of private automatic exchanges and the P-A-X Code Calls. Description of switchboards, instruments and accessories. 38 pp. Ill. 5 x 8 in.

Stromberg-Carlson Telephone Mfg. Co., Rochester, New York.

304. *Inter-Communicating Telephone Systems. Bulletin No.* 1017. A pamphlet giving just the information required for the installation of intercommunicating systems from 2 to 32 stations capacity. 15 pp. Ill. 7¾ x 10 in.

TERRA COTTA

Atlantic Terra Cotta Company, 350 Madison Avenue, New York, N. Y.

425. *Questions Answered.* A brief but full description of Atlantic Terra Cotta and its use in buildings. 32 pp. Ill. 5¼ x 7 in.

551. *Monthly Magazine, Atlantic Terra Cotta.* The April issue contains illustrations of English Terra Cotta, 16th Century and construction details for rusticated ashlar. 16 pp. Ill. 8½ x 11 in.

National Terra Cotta Society, 19 West 44th St., New York City.

664. *Standard Specifications.* Contains complete detailed specifications for the manufacture, furnishing and setting of terra cotta, a glossary of terms relating to terra cotta and a short form specification for incorporating in architect's specification. 12 pp. 8½ x 11 in.

666. *Color in Architecture.* An illustrated treatise upon the principles of color design and appropriate technique. 38 pages. Ill. 8½ x 11 in.

667. *Present Day Schools.* Illustrating 42 examples of school building architecture with an article on school house design by James O. Betelle, A. I. A. 32 pp. Ill. 8½ x 11 in.

668. *Better Banks.* Illustrating many banking buildings in terra cotta with an article on its use in bank design by Alfred C. Bossom, architect. 32 pp. Ill. 8½ x 11 in.

The Northwestern Terra Cotta Co., 2525 Clybourn Ave., Chicago, Ill.

96. *Architectural Terra Cotta.* A collected set of advertisements in a book, giving examples of architectural terra cotta, ornamental designs and illustratons of examples of façades of moving-picture houses, office buildings, shops, vestibules and corridors in which Northwestern Terra Cotta was used. Size 8½ x 11 in. 78 pp.

TILE—ORNAMENTAL

The Associated Tile Manufacturers, Beaver Falls, Pa.

374. *Basic Specifications for Tilework and Related Documents. No. K-300.* This specification is prepared in a very systematic manner for the use of architects and builders. It is printed on one side of a sheet with facing page blank to receive memoranda. Various colored sheets make reference easy and simplify greatly the work of a specification writer in specifying tilework. 38 pp. 7½ x 10⅝ in.

375. *"Work Sheets" for Specification Writers.* To be used in connection with "Basic Specification for Tilework and Related Documents." 16 sheets 7½ x 10⅝ in.

TIME CLOCKS—See Clocks

TOILET PARTITIONS—See Wainscoting

TRIM—See Doors and Windows

TRUSSES—See Building Construction

VARNISH—SEE PAINTS

VAULT LIGHTS

American Three Way Luxfer Prism Co., 13th Street and 55th Court, Chicago, Ill.

424. *Daylighting. Catalog* 21. A complete catalog on glass prisms for use in transoms, sidewalk and floor lights, skylights, etc., for lighting places inaccessible to direct daylight. Contains also measurements, specifications and other data required by designers. 42 pp. Ill. 8½ x 11 in.

VENTILATING EQUIPMENT

The Duriron Co., Dayton, Ohio.

731. *Duriron Acid-Proof Building Equipment, Bulletin No.* 134. This bulletin contains details and specifications for the installation of equipment for handling acid fumes, acid-proof fans, pumps, pipe and ducts. 20 pp. Ill. 8 x 10½ in.

VENTILATION—See Heating and Ventilation

VENTILATORS

The Burt Manufacturing Co., Akron, Ohio.

207. *General Catalogue* covering entire line of Ventilators, Exhaust Heads and Filters. Separate leaflets on each type of ventilator, vent and damper.

WAINSCOTING

The Vitrolite Company, Chamber of Commerce Building, Chicago, Ill.

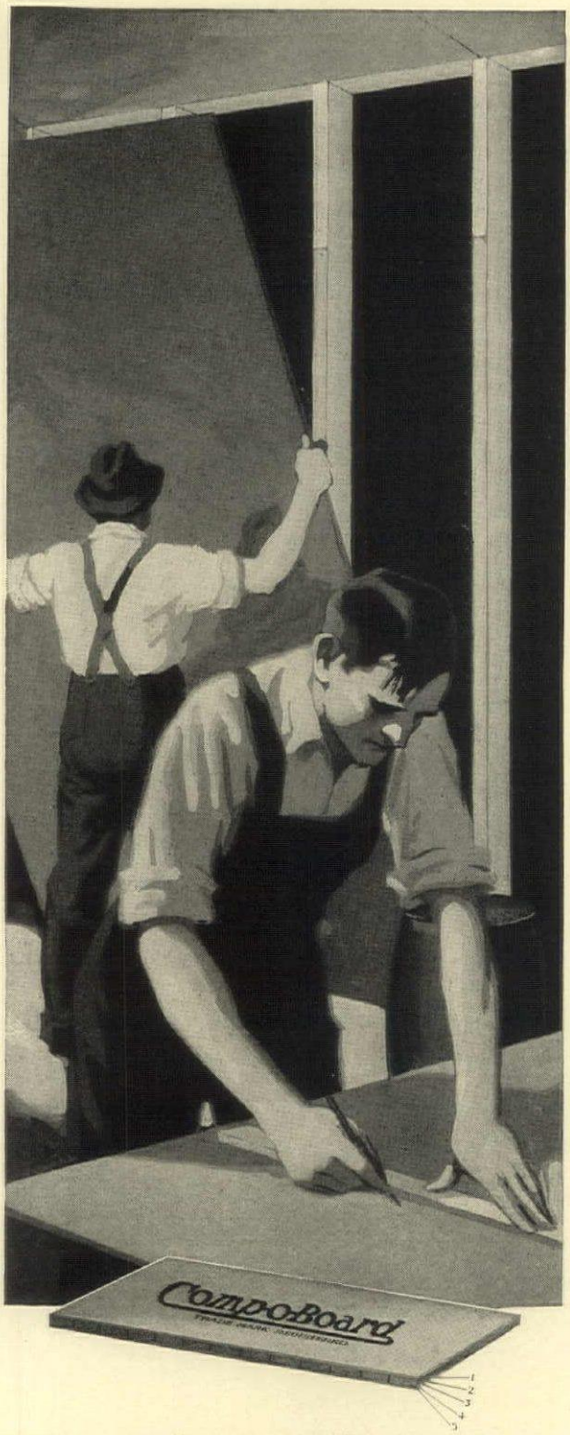
648. *Toilet Partitions and Wainscoting. Architects' Tile Bulletin No.* 7. Describing the uses of Vitrolite, its physical properties, details of installation and specifications. 32 pp. Ill. 8½ x 11 in.

WALL BOARD

The Compo Board Co., Minneapolis, Minn.

733. *Compo Board.* A booklet describing the combination of heavy paper, wooden core and cement in a five ply wall board, its qualities and uses. 16 pp. Ill. 5 x 7½ in.

734. *Instruction Sheets.* Instructions for correct application of Compo Board and the proper places for its use. 4 pp. and 8 pp. Ill. 3 x 6 in.



Compo-Board is composed of three parts: The specially prepared covering, Nos. 1 and 5, the wood core, No. 3, the cement, Nos. 2 and 4. Compo-Board will not warp, buckle, shrink or crack. It is moisture-proof. For wall lining, partitions and hundreds of other uses it has no equal. Compo-Board is handled by lumber dealers everywhere.

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The experienced carpenter will tell you that on Compo-Board you can use wall paper or any other decoration and that the walls will stay firm and smooth indefinitely. He knows because he has used it for over thirty years.

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The Compo-Board Company, 4410 N. Lyndale, Minneapolis, Minn.

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REFERENCE LIST OF BUSINESS LITERATURE—Continued

WALL COVERING—See also Lincrusta-Walton

Standard Textile Products Co., 320 Broadway, New York, N. Y.

111. *Sanitas, Modern Wall Covering.* Folio. Plates of color renderings of various interiors, with suggestions for the library, living room, dining room, boudoir, kitchen and church wall covering, using Sanitas. Size 11½ x 6 in. 15 plates.

WALL COVERING—See also Lincrusta-Walton

Standard Textile Products Co., 320 Broadway, New York, N. Y.

112. *Sanitas, and Its Uses.* Booklet. Text and color illustrations of Sanitas as a wall covering, with tables for wall and ceiling measurements. Notes on sanitary character, cleanliness and durability of Sanitas. Size 5 x 7 in. 28 pp. 6 color plates and 2 sample sheets.

WATER HEATERS

Ruud Manufacturing Co., Pittsburgh, Pa.

507. *Ruud Gas Water Heaters.* Bulletins in filing folder describing instantaneous automatic water heaters for small homes and special uses, multi-coil automatic storage systems, automatic storage systems and tank water heaters. Details for connections, hot water service and specifications. 19 pp. Ill. 8½ x 11 in.

590. *Ruud Multi-Copper-Coil Automatic Storage Systems.* Catalog describing automatic hot water storage systems of large capacity for large residences, apartment buildings, hotels, hospitals, gymnasiums and factories. Details, capacities and dimensions for complete line. 32 pp. Ill. 6 x 9 in.

WATERPROOFING—See also Dampproofing

Security Cement and Lime Co., Hagerstown, Md.

743. *Waterproofing with CAL.* A portfolio of miscellaneous information treating of the integral method of waterproofing concrete, specifications and tests. 24 pp. Ill. 8½ x 11 in.

WATER SOFTENERS

The Permutit Company, 440 Fourth Ave., New York

105. *Permutit (Water Rectification Systems.)* Illustrated booklet. Describes all methods of softening water, including the original Zeolite process. For homes, hotels, apartment houses, swimming pools, laundries and industrial plants. Size 8½ x 11 in. 32 pp.

482. *Bulletin No.* 1600. This bulletin treats of the value of soft water in the house and describes the Wayne Domestic Water Softening Systems. 6 pp. Ill. 8¼ x 10½ in.

Wayne Tank and Pump Co., Fort Wayne, Ind.

687. *Water Softening and Filtration.* A valuable treatise on the subject of slow-acting and quick-acting types of water softeners and their application to commercial, industrial and domestic uses. The construction of and uses for Wayne Pressure Filters are also adequately described. 32 pp. Ill. 8¼ x 10½ in.

WATER SUPPLY—See Pumps

WEATHER STRIPS

The Diamond Metal Weather Strip Co., Columbus, Ohio.

616. *The Diamond Way.* A catalog of full size details showing the application of Diamond metal weather strips to double hung and casement windows and doors with complete specifications. 34 pp. Ill. 8½ x 11 in.

The Higgin Manufacturing Co., 5th and Washington Ave., Newport, Ky.

354. *Higgin Metal Weather Strips.* A booklet of considerable value to architects and builders on the use of weather strips. Ask also for the companion book on "The Reason Why." Each booklet 12 pp. Ill. 6 x 9 in.

Monarch Metal Products Co., 5020 Penrose Street, St. Louis, Mo.

512. *Monarch Metal Weather Strips.* The publication embodies all the suggestions for advertising literature made by the Committee on Structural Service of the American Institute of Architects. It contains a treatise on inleakage around windows together with description of Monarch Metal Weather Strips. Contains many detail working drawings. 48 pp. Ill. 7½ x 10½ in.

WINDOWS—See Doors and Windows

WIRE AND CABLE—See Electric Wire and Cable

WOODWORK—See also doors and Windows—Lumber

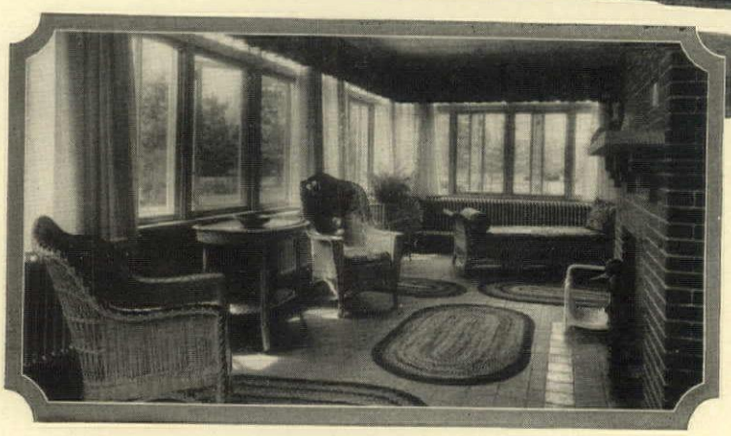
Curtis Companies Service Bureau, Clinton, Iowa.

663. *Keeping Down the Cost of Your Woodwork.* A book illustrating Curtis interior woodwork and built-in cabinets and fixtures designed by Trowbridge and Ackerman, Architects, New York. Colored illustrations and details. 16 pp. Ill. 7 x 9¼ in.

Hartmann—Sanders Company, 6 East 39th St., New York, N. Y.

334. *Catalog No.* 47. Illustrating Kell's Patent Lock Joint wood stave columns for exterior and interior use. 48 pp. Ill. 7½ x 10 in.

HIGGIN ALL METAL WINDOW SCREENS



Residence of Lewis W. Kenny, Lynnfield, Mass.

Charles Vernon, Lynn, Mass., Architect.

Equipped with Higgin All-Metal Window Screens

A Suggestion on Window Detail

Proper treatment of window detail so affects architectural style that it is not surprising that the architect is highly critical of the window screens to be installed.

That he insists on Higgin All-Metal Screens in his specifications is simply thoughtful protection of the ultimate beauty of the completed building. The narrow enameled metal frames are entirely unobtrusive whether viewed from within or without. They do not interfere with the subtle effects of high light and shadow the architect strives to hold in his exterior detail.

And particularly in the solarium, heavy wooden screens are out of place. Note the sense of airy openness in the solarium interior above —an example of Higgin Screening.

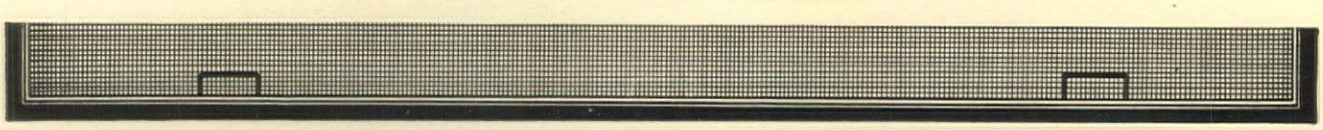
A Higgin service man will come to your office at your call and discuss with you how Higgin fitters and Higgin co-operation can assist you by improving the screening of the homes and buildings you are now erecting.

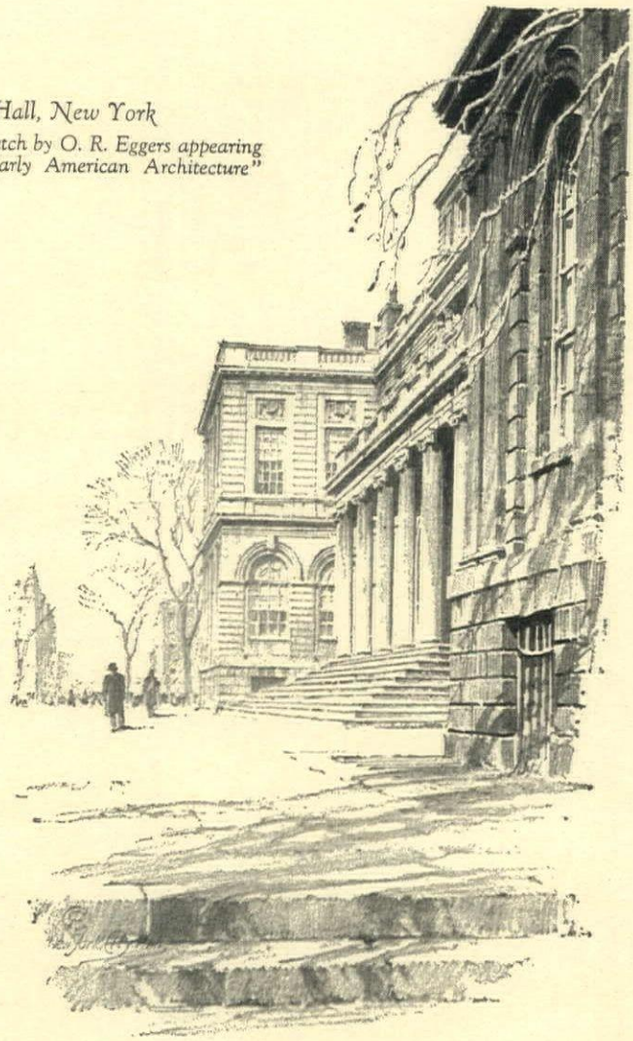
SEE OUR CATALOGUE IN SWEET'S

The HIGGIN Mfg. Co.
Newport, Ky.
Toronto, Canada

Manufacturers of Higgin All-Metal Weatherstrips and Higgin All-Metal Screens

Look in your telephone or city directory for the address of your local Higgin Service Office, or write to the home office direct.





City Hall, New York
from an original sketch by O. R. Eggers appearing in "Sketches of Early American Architecture"

New York City Hall

restored from time-faded drawings

Modern wonders of architecture overtop New York's City Hall on every side. Yet to this day architects regard this old building as unexcelled for perfect proportions and beautiful design.

It was built in 1803-12 at a cost of $500,000, an enormous expenditure in those early days of city finance. John McComb, Jr., the architect-builder, received but six dollars a day for his services. For this sum he developed a set of drawings which are considered today as excellent examples of artistic skill.

From these old drawings made by McComb, all but one of the historic interiors of City Hall, which had been altered by changing city authorities, have now been restored as nearly as possible to their original design.

The thoroughness with which this restoration work has been preserved and protected for future generations is shown by the treatment of the Governor's suite.

This suite is finished in a mellow cream enamel. Foundation coats of Dutch Boy white-lead and oil were followed by two coats of enamel. Each coat of paint was thoroughly sandpapered. The enamel was rubbed down with pumice stone and water.

The restoration and decoration of the Governor's suite, as well as the other interiors of New York's City Hall were executed by Grosvenor Atterbury, Architect, F. A. I. A., with the collaboration of his associate, John Almy Tompkins.

Plates of John McComb's original drawings sent free

In all of this restoration work, McComb's original drawings, wherever they existed, were painstakingly followed. We have been permitted to reproduce a few of these drawings in a Portfolio of Early American Architecture, which also contains accurate measured drawings of other noteworthy Colonial buildings. It will be sent free to any architect who writes for Portfolio No. 11.

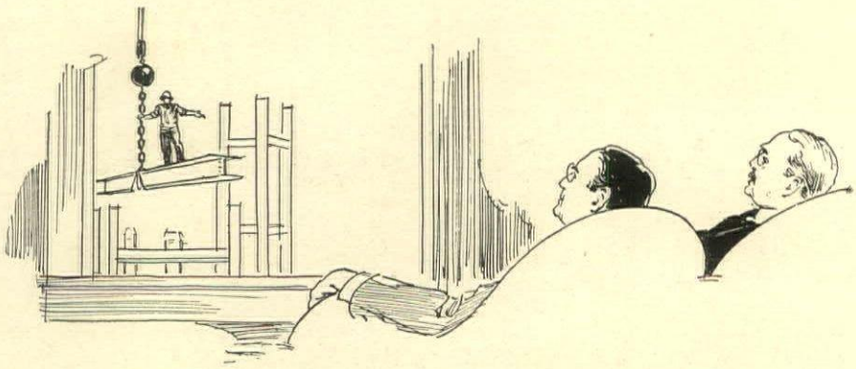
The historical notes you have just read will not, however, appear in the Portfolio. So keep this page for reference after you receive your Portfolio.

"Save the surface and you save all"—Dutch Boy

NATIONAL LEAD COMPANY

Makers of Dutch Boy white-lead, the logical choice for preserving and beautifying distinctive design

New York, 111 Broadway; Boston, 131 State St.; Buffalo, 116 Oak St.; Chicago, 900 West 18th St.; Cincinnati, 659 Freeman Ave.; Cleveland, 820 West Superior Ave.; St. Louis, 722 Chestnut St.; San Francisco, 485 California St.; Pittsburgh, National Lead & Oil Co., of Pa., 316 Fourth Ave.; Philadelphia, John T. Lewis & Bros. Co., 437 Chestnut St.



"—Faith in mathematics and extreme specialization—

I WONDER when we stopped being afraid?" Trent tapped his fingers idly on the arm of his chair.

"Of what?"

"Oh, roofs toppling on our heads and that sort of thing. Ever seen Amen Ra at Karnak? The hypostyle hall is just one mass of columns. Three or four times more than necessary, even with a decent margin of safety. The Egyptian was *afraid.* He wasn't sure. Show him the spindly girders over there in the Fairchild Building and he'd throw up his hands in horror, and yet we *know* they'll hold."

The other man nodded. "But that's simple. The Egyptian built to satisfy his eye. If his eye said it was safe, he was content. We build to satisfy the mind. That's what increased faith in mathematics and extreme specialization did for us. Everything going into the Fairchild Building has at one time or other been tested in the laboratory and by experience. Each class of material is specially chosen for some particular quality. Specialization! What an infinite thing that is! Kennedy ran over some of the Fairchild data with me yesterday. He's even carried specialization to his varnishes. He's using four or five different kinds. Personally varnish to me was always just varnish. Kennedy opened my eyes with his arguments. Here is a rough copy I made from his specifications."

1. ELASTICA FLOOR FINISH
   The one perfect varnish for floors.

2. ELASTICA INTERIOR VARNISH
   For interior woodwork (standing trim) gloss or rubbed finish.

3. ELASTICA EXTERIOR VARNISH
   For front doors and exposed woodwork.

4. ELASTICA POLISHING VARNISH
   For rubbed or polished finish on interior woodwork.

5. ELASTICA FLAT VARNISH
   For producing a rubbed effect on interior woodwork without the addition cost of hand-rubbing.

6. ELASTICA SEAT VARNISH
   For church pews, chairs, etc.

The Franklin Clothes Shop, Washington, D. C.

Clow Gasteam for Retail Stores

Clow Gasteam gives to the detached store building the advantages of steam heat without a central heating plant, coal bins, etc. It supplants the unsatisfactory coal stove or auxiliary heating apparatus of makeshift nature.

Clow Gasteam is a complete steam heating system. The only connection needed is gas; water is contained in a chamber of the radiator over tiny Bunsen flames, and needs only to be replenished about every two weeks. Each radiator is an independent heating unit.

The attractive design of Clow Gasteam Radiators makes it possible to locate them to best advantage. The new Colonial Type, shown below, is particularly pleasing in its lines and finish.

Send for complete descriptive material on Clow Gasteam for your files.

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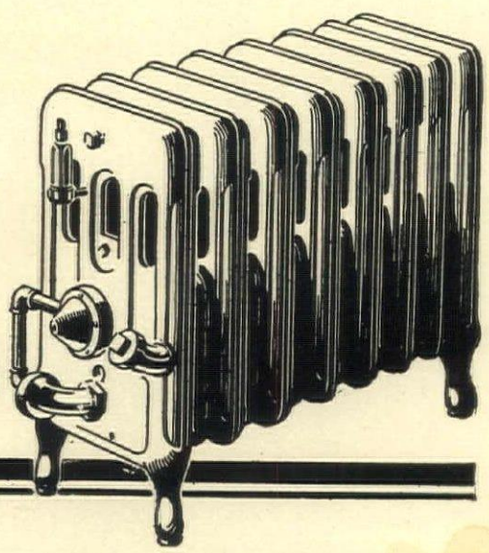

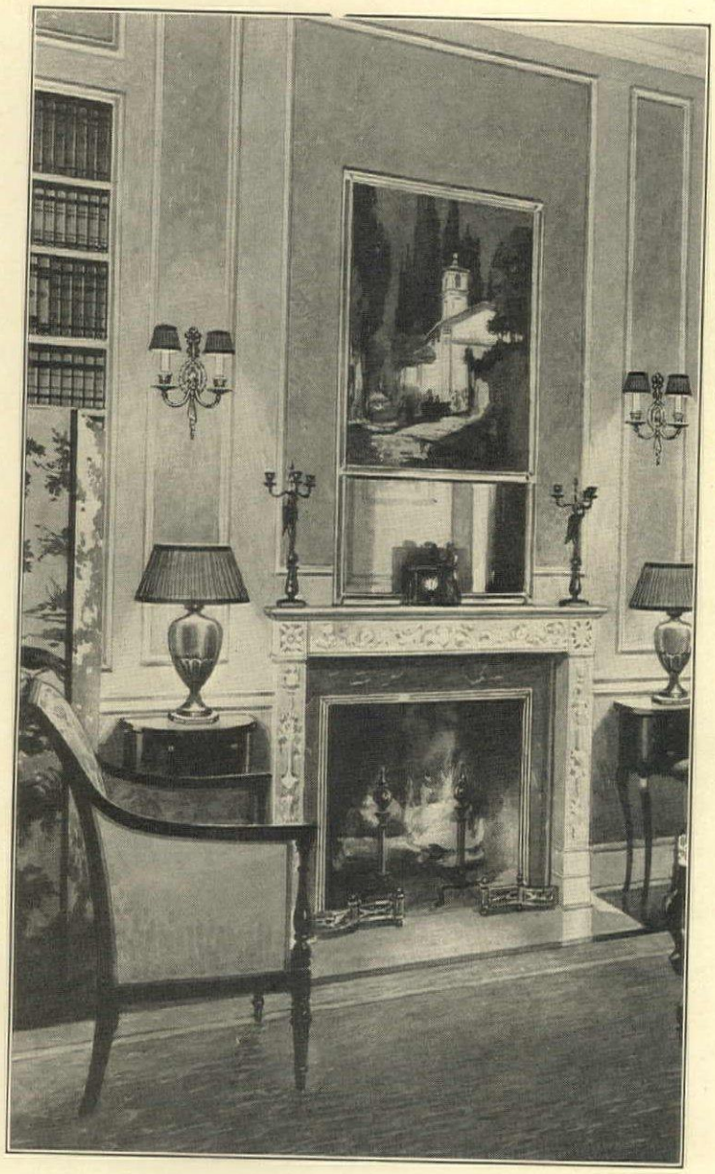

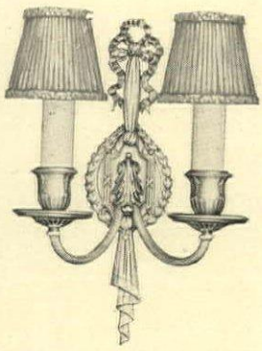

With greater appreciation of its unique possibilities, architects are using the Lightolier Galleries as an actual experimental laboratory.

For here they have at their command, illuminated and in actual use, a vast assortment of beautiful fixtures which measure up to the fine scholastic traditions of the best schools of design.

It is in a spirit of helpfulness that Lightolier extends to the architectural profession a cordial invitation to visit its quaint, roomy galleries.

UNITY OF COLOR

LIGHTOLIER fixtures are carefully designed and finished to comply with the requirements of good taste and the canons of correct color combinations. From Lightolier's large and varied stocks you can always select a beautiful fixture which will readily harmonize with a given color scheme.

The architect finds in the fine old Lightolier galleries an accessible and valuable laboratory. Here, but a few minutes from Times Square, Borough Hall or Hudson Terminal, he may test the effectiveness and artistic correctness of Lightoliers illuminated and in actual use. And when time is short and allowance is small, to specify Lightolier fixtures is to be assured of prompt delivery and unusually moderate prices.

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ATLANTIC Terra Cotta, modeled and colored at will, gives the widest freedom for originality of design.

The Cameo Theatre has the prominence that is of definite value to a theatre. The gaily colored Atlantic Terra Cotta gives it a festive air.

The adaptation of Aztec detail in the ornament has distinct architectural interest.

Cameo Theatre, Brooklyn
Harrison G. Wiseman–Hugo Taussig, Architects, Wein-Wolf Co., Builders

Atlantic Terra Cotta Company
350 Madison Avenue, New York

Atlanta Terra Cotta Company
Atlanta, Ga.

Our Department of Standards will be glad to answer questions from Architects relating to Terra Cotta construction. The best time to answer questions is while the Architects' drawings are in course of preparation.

Every piece is stamped

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and backed by our reputation.

Use of the Standard Specification for Terra Cotta, prepared by the National Terra Cotta Society, is assurance that all bids are based upon doing *at least as much* as the specification requires.
Copy on request.

Largest Manufacturers of Terra Cotta in the World

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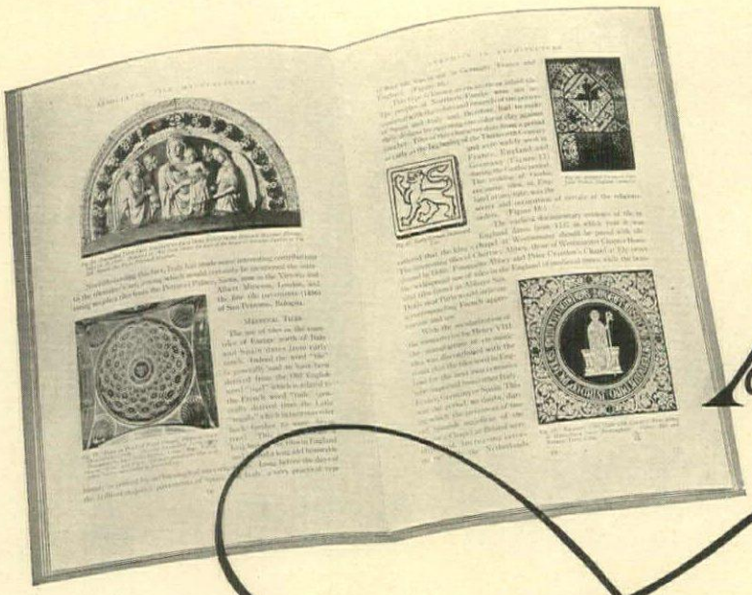


Ceramics in Architecture

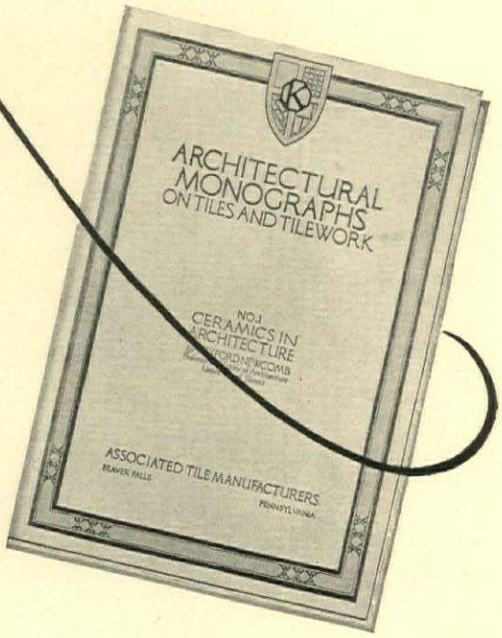
THE publication shown herewith is the first of a series of fourteen Monographs upon the general subject of Tiles and their uses throughout the ages.

Architects will no doubt be interested in the historic contents of the first Monograph, as well as in the discussions of the correct uses of Tiles in the various styles and periods, which are to appear in subsequent Monographs.

These will not only show how Tiles were used during the different periods, but will indicate how modern Tiles may be used to get the desired stylistic effect.

The purpose of the series is not only to familiarize the designer with the various motifs, patterns and colors, used upon interior walls and floors, but also to show how Tile inserts have served in other ways as a fine decorative function.

The Associated Tile Manufacturers will send this first Monograph, and the ones to follow, to any architect upon request.



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Every Room a *Warm* Room

—and small coal bills, too. The architect who specifies a Thatcher Round Boiler (Steam or Hot Water) knows it will keep the house at a comfortable and consistent temperature.

Thatcher Boilers are economical. They extract practically every particle of heat from the coal and distribute it evenly throughout the house. The saving on coal bills will tell the story.

74 years of manufacturing experience stand back of Thatcher Products.

Send for interesting illustrated catalog showing full details of Thatcher Boilers.

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New York, N. Y.

THATCHER FURNACE COMPANY
Makers of Good Heaters and Ranges Since 1850
THATCHER BUILDING, 39-41 ST. FRANCIS ST.
NEWARK, NEW JERSEY

WESTERN DISPLAY ROOMS
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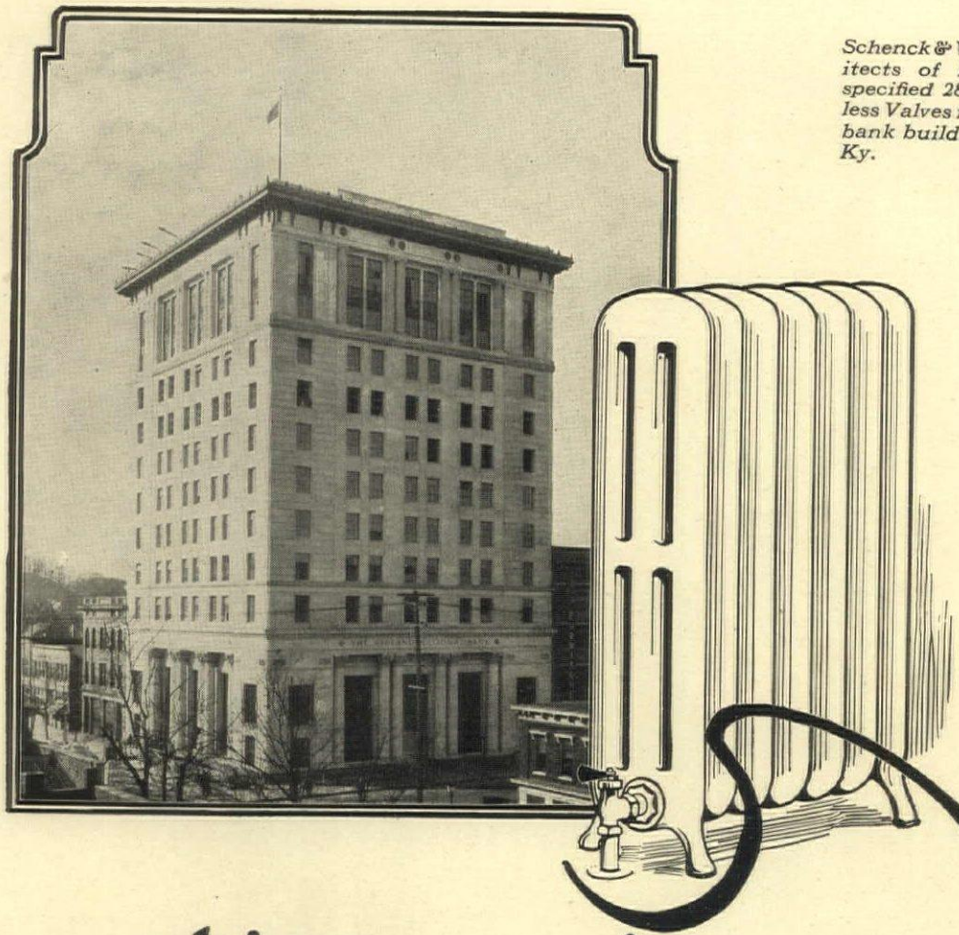
Chicago, Ill.



Schenck & Williams, Architects of Dayton, Ohio, specified 282 Super-Packless Valves for this modern bank building in Ashland, Ky.

The architects put in 282 insurance policies

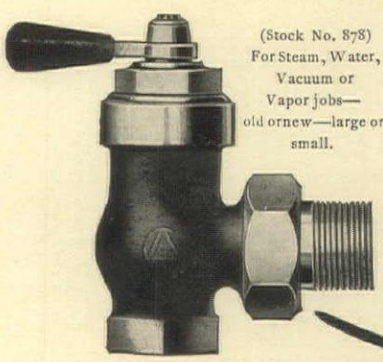
WHEN the plans for the Ashland National Bank Building in Ashland, Ky. were finished—the building was perfect.

And to keep it perfect the architects specified a Super-Packless Valve at each radiator to insure against leaks.

Architects find that this extra refinement pleases the owner because it ends costly leaks—it ends annual repacking, it ends all fussing and attention.

And it pleases the tenant, too, because less than one easy turn calls for or dismisses the heat.

And for this heating refinement—they thank the architect.



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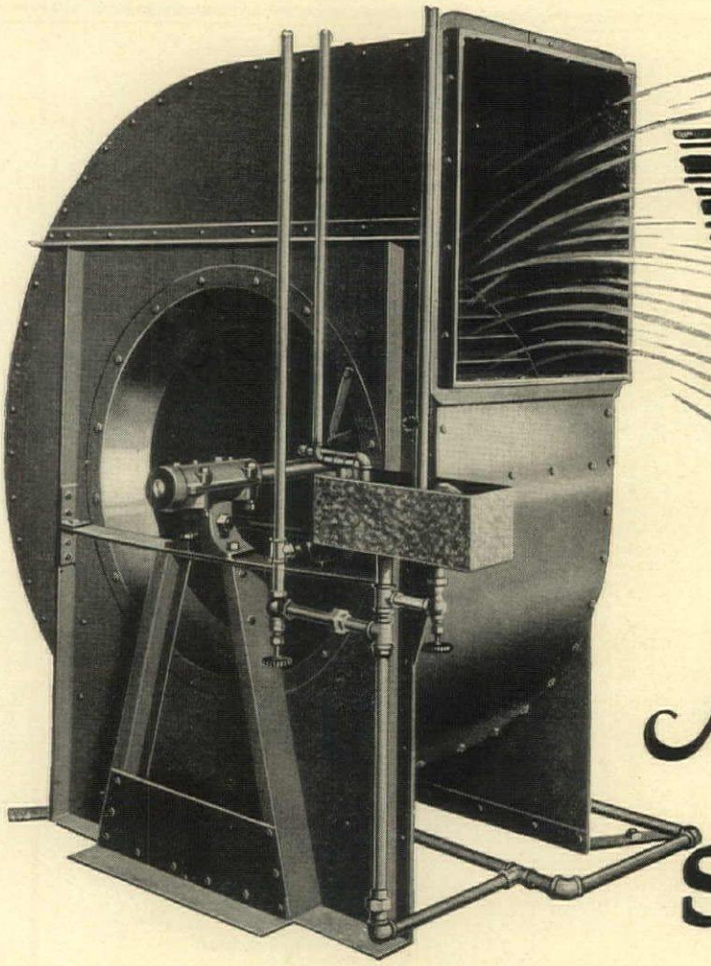

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A System *that is* Self cleaning

An air washing system that any janitor can be trusted to operate! Think what this means.

It means there is no settling tank to clean. It means that dust, lint, hair and other refuse are *automatically* removed and cannot clog the mechanism. It means no pumps or other complicated units to look after. It means a system that operates for months without attention.

You will find these advantages in the American Blower Air Washing Fan. Both the ventilating fan and air washer are combined in one compact unit.

It costs less to buy, less to install, less to operate and less to maintain than the conventional system. Where air washing is the main consideration it will operate as effectively as any more elaborate system made.

AMERICAN BLOWER COMPANY, DETROIT
BRANCH OFFICES IN ALL PRINCIPAL CITIES
CANADIAN SIROCCO COMPANY, LIMITED, WINDSOR, ONT.

(388)

American Blower

"Sirocco" TRADE MARK

VENTILATING, HEATING, AIR CONDITIONING, DRYING, MECHANICAL DRAFT

Manufacturers of all Types of Air-Handling Equipment ——— Since 1881

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Residence of Louis Rozman Page, Villa Nova, Pa., Brockie and Hastings, architects, another of the many fine homes equipped with a McCray refrigerator.

Most Important of All In the Home

When you architects plan a new home, the most important considerations of your client are comfort, convenience, health. Consider for a moment how much a McCray refrigerator enables your client really to enjoy his home.

By keeping foods pure, wholesome and fresh, the McCray assures wholesome, palatable meals—protects the family's health—and does all this efficiently, economically, conveniently.

The McCray can be used, without change, with either ice or mechanical refrigeration. Outside icing features, originated by McCray, available if desired.

Not only in homes of the finest type, but in hotels, clubs, hospitals, florist shops, stores and markets, McCray is the recognized standard. McCray builds refrigerators for *all purposes.*

Send for our latest catalogs for your files. McCray builds to order to meet any requirements and will gladly co-operate with you in every way possible. *Free Blue Prints* of suggested equipment will be provided. Simply send a sketch of your client's requirements.

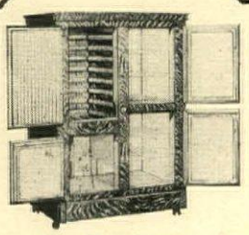
Look for the McCray Name Plate

You'll find it on the refrigerator equipment in the better grocery stores, markets, restaurants, hotels and in homes. This name plate gives positive assurance of fresh, wholesome foods.

McCRAY REFRIGERATOR COMPANY
2461 Lake Street **Kendallville, Ind.**

Salesrooms in all Principal Cities ***(See Telephone Directory)***

McCRAY
REFRIGERATORS
for all purposes



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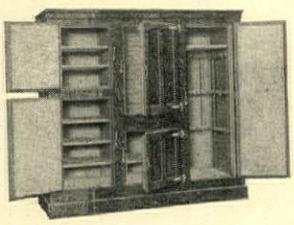

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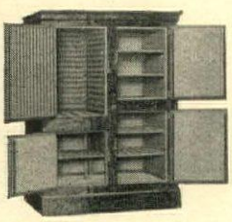
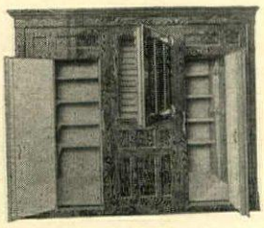


For Clubs, etc.



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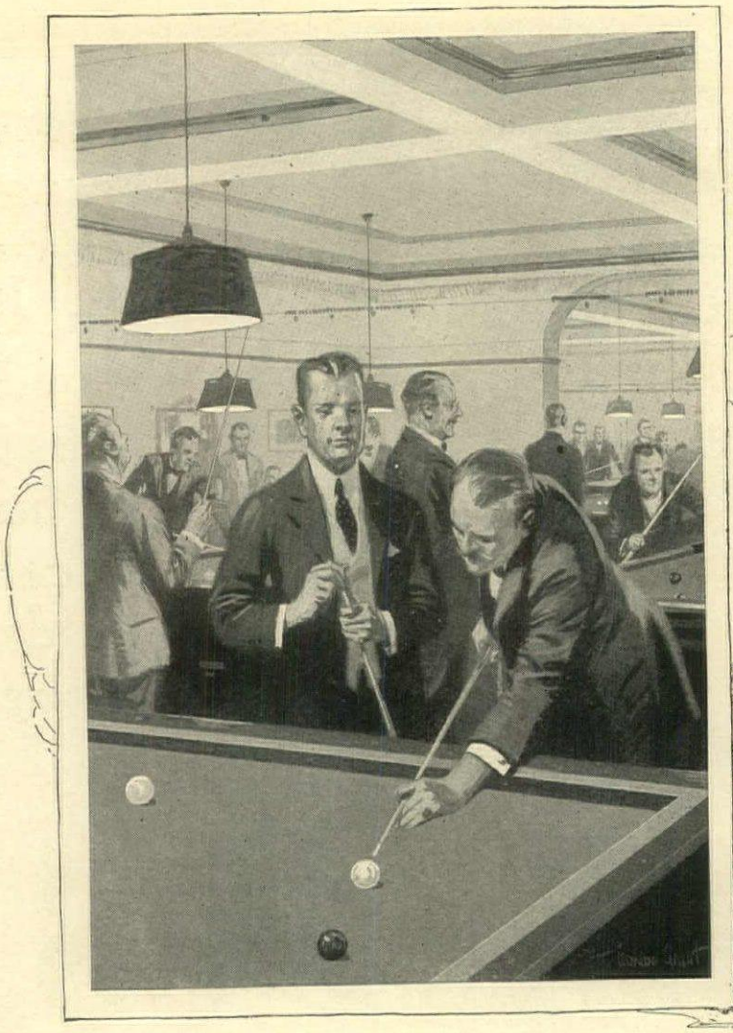
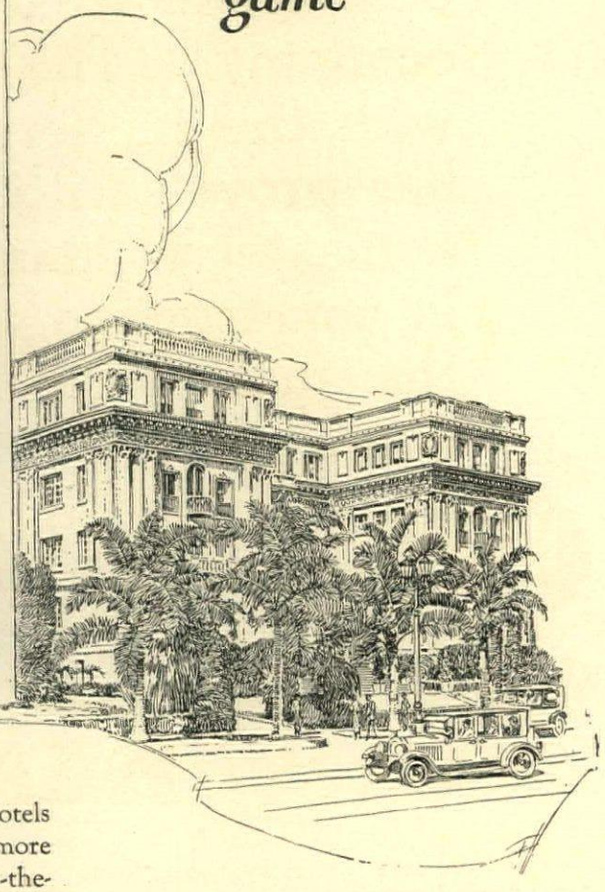


billiards

a gentleman's game



Garden Court Apartments
Los Angeles, Calif.

J. E. Ransford, Owner
Frank Meline, Architect and Builder

Billiard room equipment consisting of mahogany Chateau Carom and Chateau Pocket tables furnished by Brunswick.

BUILDERS and owners of apartment houses, hotels and similar buildings are realizing more and more the importance of providing facilities for under-the-same-roof entertainment for tenants. They have learned that facilities for such recreations as billiards and bowling pay not only in making the property more attractive to tenants, but in actual dollars-and-cents return in rentals.

Architects designing fine homes, also, are giving more attention to the question of providing special ground-floor space for billiard room purposes.

As makers of the world's finest billiard and bowling equipment and accessories, we are in a position to furnish complete information regarding floor space, ventilation and every other detail needed in planning for such recreation either in the construction of new buildings or in remodeling operations. Information along these lines is furnished gratuitously and, of course, without obligation.

The BRUNSWICK-BALKE-COLLENDER *Company*
Branch houses in the principal cities in the United States and Canada
623-633 South Wabash Avenue, CHICAGO

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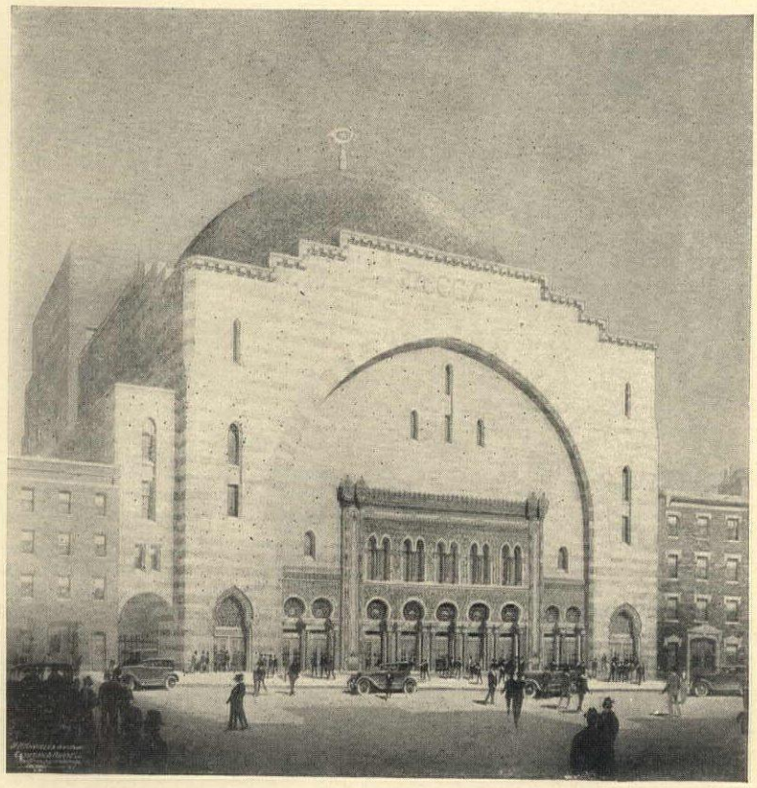

CLINTON & RUSSELL, Architects.

BAKER, SMITH COMPANY, Contractors.

WERNER NYGREN, Consulting Engineer.

MECCA TEMPLE, NEW YORK CITY

The Mystic Order of the Shrine have endeavored to embody every structural and mechanical refinement in this new temple. It is intended to stand as a model for the various shrines of the country.

The Sturtevant Heating and Ventilating System includes the following units:

5 multivane fans delivering a total volume of 277,000 cubic feet of air per minute against ⅞″ to 1″ pressure.

1 steel plate fan for kitchen ventilation.

7426 sq. feet of Heating surface.

B. F. STURTEVANT COMPANY

Sales Engineering Offices

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PUTS AIR TO WORK

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General Machinery Co. — Tampico
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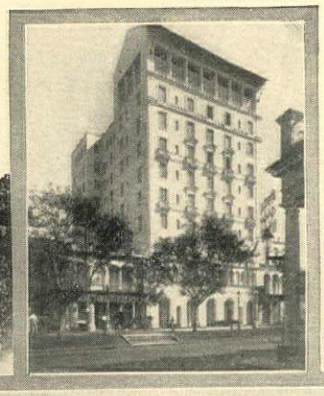

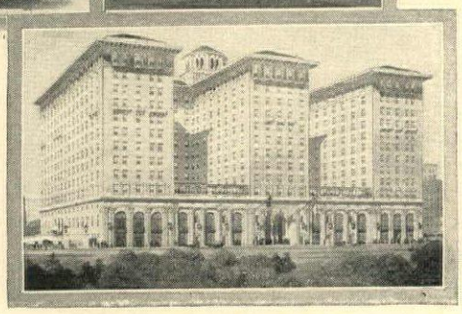

To the left, below, the New York-Biltmore Hotel, New York, N. Y. Warren & Wetmore, New York, N. Y., Architects. Above, the Atlanta-Biltmore Hotel, Atlanta, Ga. To the right, above, the Sevilla-Biltmore Hotel, Havana, Cuba. To the right, below, the Los Angeles-Biltmore Hotel, Los Angeles, Calif. Schultz & Weaver, New York, N.Y., Architects.

Where service is paramount

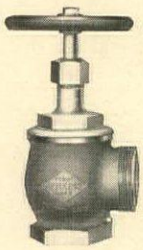

Fig. 715, Jenkins Fire Line Angle Valve, without cap or chain.

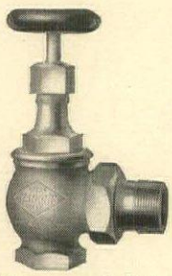

Fig. 168, screwed, Jenkins Angle Radiator Valve, with wood wheel and male union.

Patrons of first class hotels expect and insist on first class service. To them, convenience, comfort and safety are paramount.

All equipment, therefore, that enters into the construction of such buildings must do its share in providing guest satisfaction. Good valves in the plumbing, heating and fire prevention systems are indispensable.

It is no wonder, then, that Jenkins Valves are being installed in an ever-increasing number of the finest hotels, such as the Atlanta-Biltmore, Los Angeles-Biltmore, New York-Biltmore, Sevilla-Biltmore and others, both in this country and elsewhere. For Jenkins Valves can be depended upon to stand up under severe as well as normal conditions, and to contribute in full measure to the satisfaction of the management and its guests. Jenkins Valves pay for themselves over and over again in the many years service they give.

For the maximum service, and true valve economy, specify Jenkins throughout.

JENKINS BROS.

80 White Street.....New York, N. Y.
133 No. Seventh Street . . Philadelphia, Pa.
524 Atlantic Avenue.....Boston, Mass.
646 Washington Blvd. .....Chicago, Ill.

Always marked with the "Diamond"

Jenkins Valves

SINCE 1864

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WHEREVER REFRIGERATION IS NEEDED

THE ARCHITECT is quick to realize the value of built-in refrigerators. He visualizes them as a part of the mental picture of the commission he has been awarded and they are included in his finished work. After all, it is only logic that directs the planning in this direction. A "Ready-Built" refrigerator in a modern hotel, apartment or club, is like a folding bed, it consumes too much valuable floor space. Hence the In-a-door beds and other modern devices for the conservation of space.

Jamison Door equipment guards the cold storage plants of the world's largest food producers, and pictured above in the center is a Jamison Refrigerator Front installation on a built-in refrigerator that gives all the satisfaction and efficiency found in a mammoth plant, yet reduced in size to meet the requirements of smaller users of refrigeration.

Our Catalog Number 11 will simplify any refrigerator door problem that might confront you. Please address Desk 12.

JAMISON REFRIGERATOR FRONTS

for Better Refrigeration

JAMISON COLD STORAGE DOOR CO.

HAGERSTOWN, MARYLAND, U. S. A.

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Re-roofed home of Mr. T. P. Sylvan, Montclair, New Jersey

RE-ROOFED PERMANENTLY

The home shown above was originally roofed with wood shingles of first quality. But unlike asbestos and cement, wood is perishable. In a very few years, though the house was still in excellent condition, the roof was gone.

The owner decided to re-roof for the last time and used Mohawk Tapered Asbestos Shingles. Made of best Portland Cement and pure Asbestos Fibre they will easily outlast the house; and roof repairs are at an end. Had Mohawk Tapered Asbestos Shingles been used when this house was built the owner would have been saved much trouble and much expense.

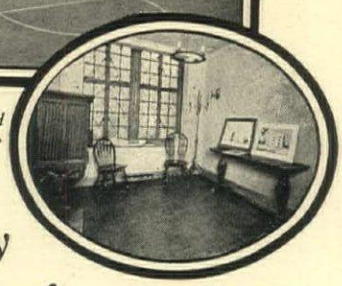
Mohawk Shingles come in six beautiful colors. Their thick butts cast a beautiful, natural shadow line. Come ready to lay. No sorting. No punching. Ordinary roof construction easily supports their weight.

Sample shingles and circular gladly sent upon request

MOHAWK TAPERED ASBESTOS SHINGLES

MOHAWK ASBESTOS SLATE COMPANY. UTICA, N.Y.

Rodd floor of California Redwood Blocks in Gymnasium of Carnegie Institute of Technology, Pittsburgh, Pa. Henry Hornbostel, Architect.



Rodd Floor of California Redwood Blocks in office of Thos. F. Dunn, Architect, New York City.

Equally Suitable for Office, Gymnasium or Factory

RODD floors of California Redwood Blocks are many-purpose floors—equally suitable for the private office, fine residence, school, or store, or for heavy duty service in factories and foundries.

They are light in color and may be sanded smooth and given a wax or varnish finish. The exposed end grain and the shape of the blocks gives the appearance of mottled tiles, without strongly defined parallel lines to accentuate room shapes.

Quiet and dustless, the surface becomes harder and stronger under heavy traffic without either cracking or developing corrugations. Moisture does not cause Redwood floors to swell and heave or dryness make them shrink and open at the joints, because properly seasoned Redwood is unusually still wood. Every Redwood block is seasoned by a special drying process.

During growth Redwood is permeated by a *natural*, odorless preservative which protects it against all sorts of fungus rot and decay. Redwood floors do not rot. They are odorless—suitable for installation even in food warehouses. In factories and foundries Redwood block floors have stood the test of long, hard service.

• • •

Rodd specifications for floors to meet any condition of load or service, or for replacing old floors, together with estimates for complete installations, gladly submitted. Inquiries are invited.

THE RODD CO.

901 Century Bldg. Pittsburgh, Pa.

Eastern Contract Engineers for Redwood Block Floors

Manufactured by The Pacific Lumber Company

RODD FLOORS of Redwood

The Pacific Lumber Co.

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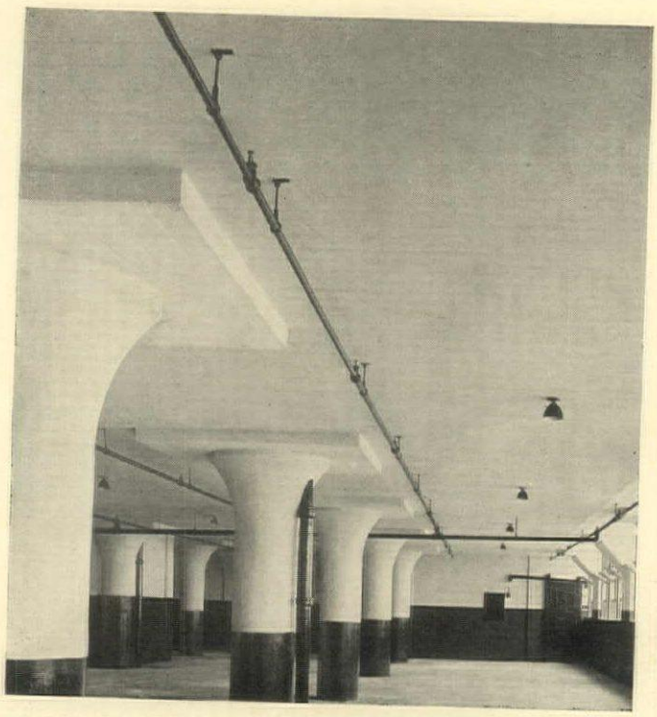
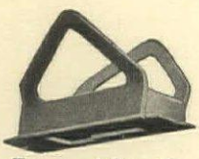


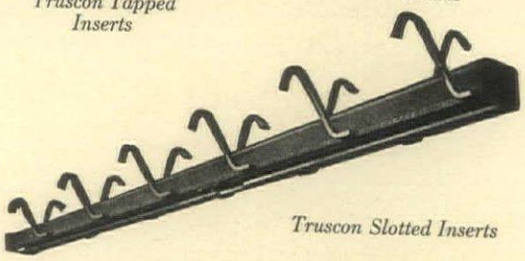
Truscon Inserts Save Expensive Drilling

Truscon Inserts built into the concrete during construction, provide a simple means of attaching shaft hangers, sprinkler systems, fixtures, etc. and eliminate later expensive drilling into concrete. They save time and permit changes in location of equipment.

Truscon Tapped Inserts



Truscon Adjustable Inserts



Truscon Slotted Inserts

Truscon Steel Inserts are made in three types and various sizes to meet all requirements of heating, plumbing and construction work. All inserts adapted for ½ in., ⅝ in., or ¾ in. bolts. Ask us about them.

TRUSCON STEEL CO. Youngstown, Ohio

Warehouses and Offices from Pacific to Atlantic.
For addresses see phone books of principal cities.
Canada: Walkerville, Ont. Foreign Div: New York

TRUSCON PRESSED STEEL INSERTS

The DUNHAM REG. TRADE MARK HEATING SERVICE

The silent, efficient watchdog of the coal pile.

A fitting companion to the Dunham Trap is the Dunham Packless Radiator Valve.

The Dunham Trap combines beauty and efficiency

REALIZING that beauty and efficiency are not in conflict, but rather in harmony, the C. A. Dunham Co. incorporated in the Dunham Radiator Trap all the pleasing grace of line to be found in the Grecian urn.

This symmetry was not founded solely upon a desire to produce a radiator trap of pleasing appearance, for it was discovered that the urn-like shape of the Dunham Trap body was in itself best suited to the proper performance of a trap.

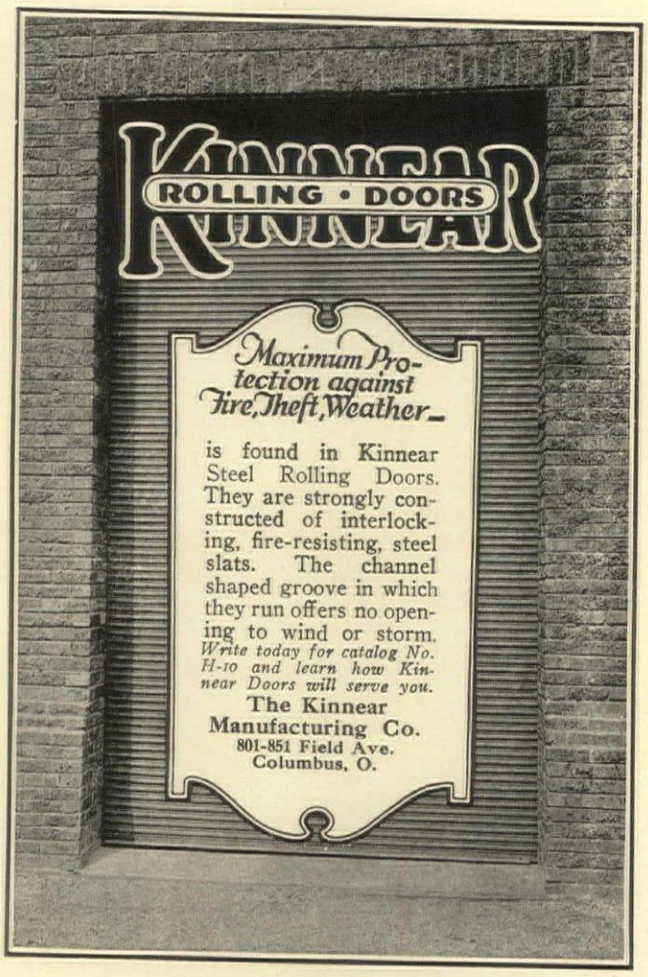
Not alone is the Dunham Thermostatic Radiator Trap a thing of beauty. It performs a function which no other competitive trap does so successfully and for such long periods of time.

The removal of air and water from radiators is indispensable if they are to be kept filled with live steam. The Dunham Thermostatic Trap does this automatically, responding to the actual conditions of pressure and temperature that exist within the radiator.

C. A. DUNHAM CO.

230 East Ohio Street, Chicago

Seventy branch and local sales offices in the United States and Canada bring Dunham Heating Service as close to your office as your telephone. Consult your telephone directory for the address of our representative in your city.



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243 West 39th Street, New York

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WANTED—Two first class senior draftsmen, one for general work and another accustomed to Church work in Gothic design; both capable of preparing general working drawings, large scale and full size details from sketches prepared by the Head Designer. State age, experience and training, references, married or single, and salary desired in first letter. Ritcher & Eiler, Architects, 147 N. 5th St., Reading, Pa. (2447-48)

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Sales Manager
WANTED

ARCHITECT desired as sales manager for aggressive concern, where architectural knowledge, combined with pleasing personality, offers a good position in New York City for energetic, educated man. Must be a Catholic; age about thirty to thirty-five. Good opportunity for man now in architect's office to get into the active selling field. Applicant must be New York City man. Address 148-A, care The American Architect. (2448)

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ARCHITECT, Paris diplomé, all round and well experienced designer open to engagement for position with responsibility. Smaller New York architect's or decorator's office preferred. Full or part time. Address 148-F, care The American Architect (2448-49-50)

DRAFTSMAN would like to communicate with architectural firm that needs experienced man of high class general ability. Address 148-E, care The American Architect. (2448)

BEAUX-ARTS INSTITUTE OF DESIGN

126 East 75th Street, New York City

Free Instruction in

ARCHITECTURAL DESIGN **INTERIOR DECORATION**
SCULPTURE, LIFE, COMPOSITION, ORNAMENT
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Instruction founded on the principles of the Ecole des Beaux Arts of Paris. Circular free on application.

SCHOOL OF THE FINE ARTS YALE UNIVERSITY

Department of Architecture

1. A four-year general course in Architecture leading to the degree of Bachelor of Fine Arts (B. F. A.).
   Students may specialize in the above course (a) in Design; (b) in Construction.
2. Special students properly qualified are admitted to the courses in the Department of Architecture.
   Students of the Department of Architecture may avail themselves of general allied courses in Painting and Modeling. For special catalogue of the Department of Architecture address Secretary of the School of Fine Arts Yale University, New Haven, Connecticut.

DRAFTSMAN, structural and reinforced concrete designer. Good draftsman. Knowledge of architecture. Location N. Y. C. and vicinity. Address 148-D, care The American Architect. (2448)

ARCHITECT AND DRAFTSMAN, age 31, married, at present in charge of drafting room and specifications for big office in large Eastern city, wishes to hear from architect requiring assistant capable of taking charge of office. Neat, rapid draftsman, and thorough specification writer. Technically trained with 12 years' architectural experience which includes much school, theatre and bank work. With present concern four years. Address 148-B, care The American Architect. (2448)

SPECIAL NOTICE

ARCHITECT now practicing in town of 40,000, will consider association offering larger opportunities. Technical education, ten years' drafting, 8 years' practice, practical and able designer who can produce results and be of real asset to a responsible established business. Address 148-C, care The American Architect. (2448)

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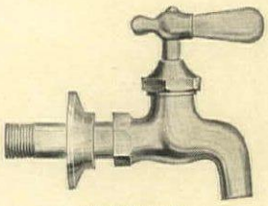
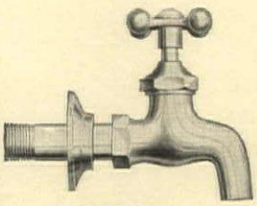
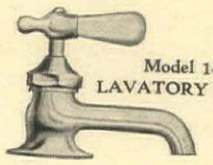


Model 120-P
SINK FAUCET



Model 120
SINK FAUCET



Model 140-P
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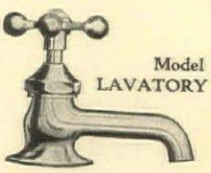
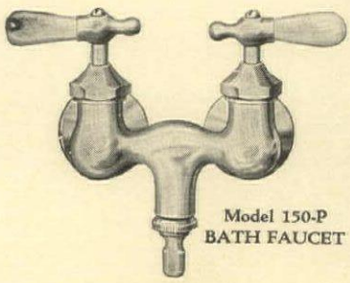


Model 140
LAVATORY FAUCET



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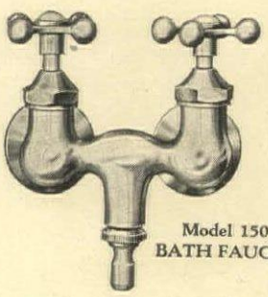
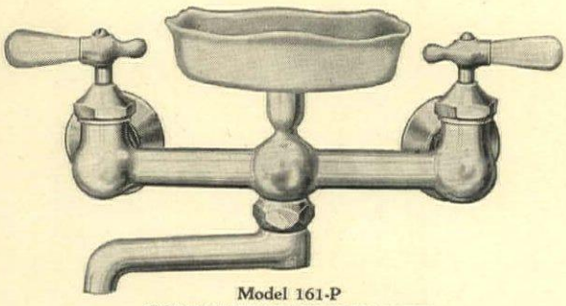
BATH FAUCET



Model 150
BATH FAUCET



Model 161-P
COMBINATION SINK FAUCET

The metal with Permanent luster—
EVERBRITE

NOT NICKEL PLATED

NOW YOU can specify faucets of standard compression design, made of Everbrite Metal—the solid white metal that will never turn yellow or wear away under the hardest kind of usage. The graceful simplicity of design makes these faucets especially pleasing.

The need for faucets of this kind has long been apparent to architects and home owners alike, as well as to the plumbing industry. The best nickel plating is but a temporary coating, which will wear away in a comparatively short time, showing the brass beneath.

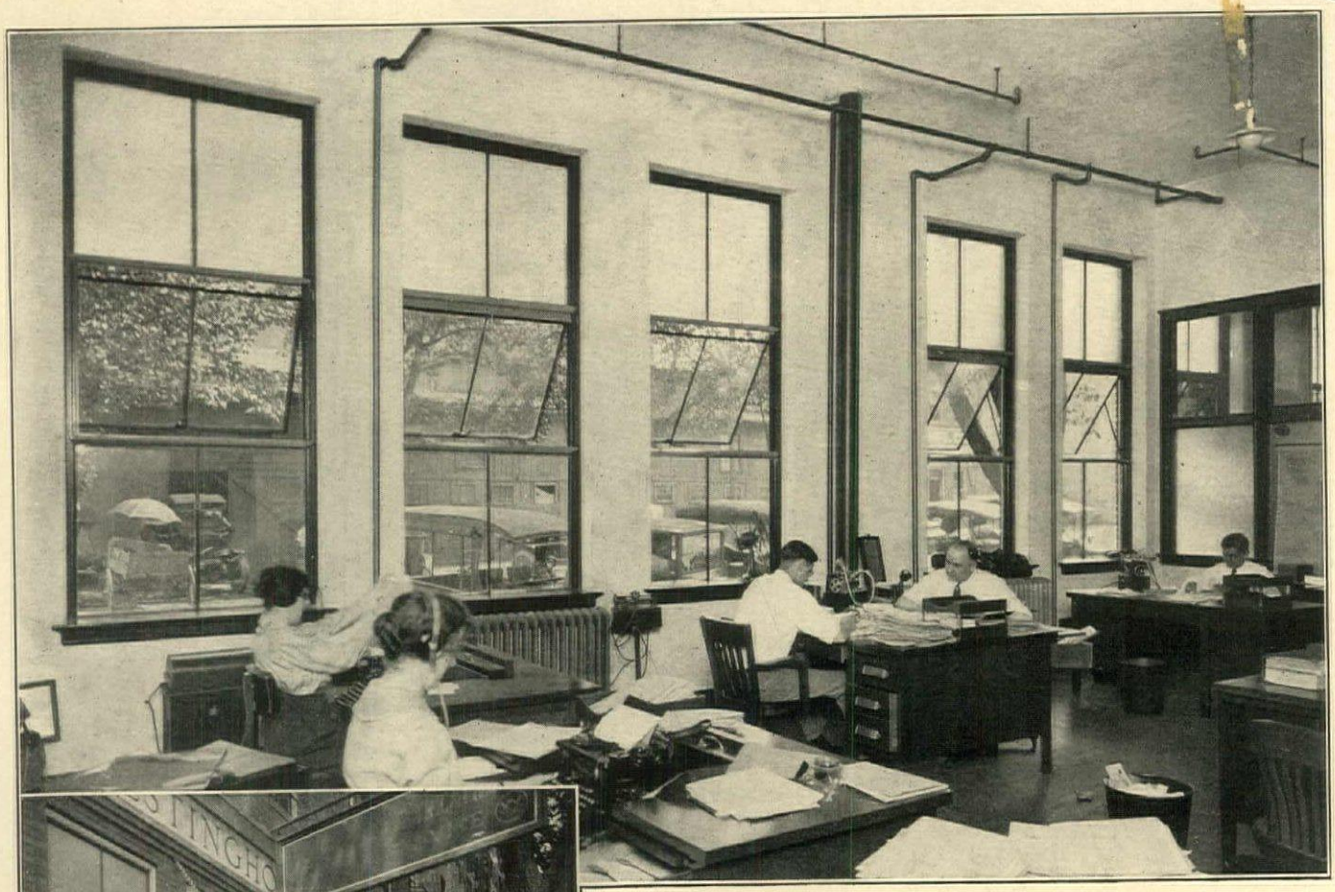
Everbrite Metal, being solid white all the way through, retains its beautiful silvery luster forever.

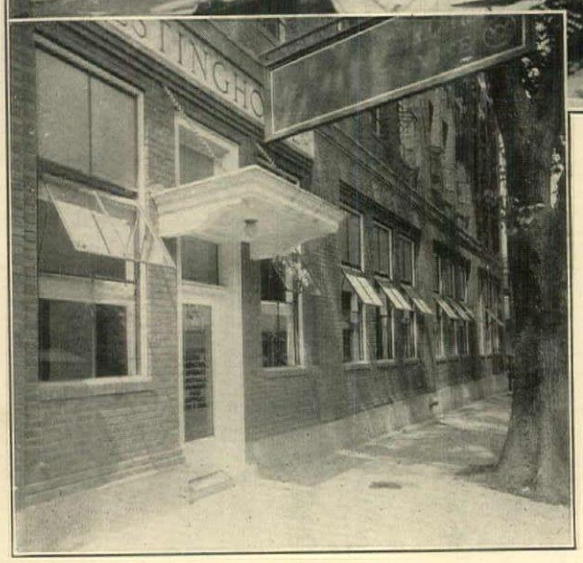
The price of "Everbrite" Standard Faucets is slightly higher than that of brass faucets—of course. In view of their vast superiority that is but natural. Considered from the viewpoint of length of service, the "Everbrite" is more economical than any brass faucet ever made.

There is one way—and only one way—that you can be sure that "Everbrite" Faucets will be installed. Write the word "Everbrite" into all your specifications.

Curtis Bay Copper & Iron Works

BALTIMORE MARYLAND





The maximum of daylight and any desired amount of ventilation are secured through the use of Truscon Projected Steel Windows, as used in the office of the Westinghouse Electric and Manufacturing Co., shown above.

Steel Windows Play Important Part in Modern Buildings

From the standpoint of daylight, ventilation and architectural design, steel windows play an unusually important part in the modern building.

Present day demands for fireproof structures place special emphasis on the fireproof qualities of Truscon Steel Windows. A good example of their use is the Westinghouse Electric Building, fitted with Truscon Projected Steel Windows. The use of these windows eliminates wood trim around the window. The window sets in the masonry and plaster can be carried directly to steel sash, insuring a clean cut, fireproof, sanitary finish.

Truscon Projected Steel Windows are made in two types, either swinging out at the bottom or swinging in at the top. These windows operate entirely outside the sash frame and do not interfere with shades. Any desired amount of ventilation can be obtained.

They are fireproof, rust resisting, operate perfectly and are particularly adaptable for offices, apartments, schools and hospitals.

Other types of Truscon Steel Windows are made for industrial buildings, foundries and machine shops. Hundreds of different arrangements may be secured. They can be operated individually or opened or closed by mechanical operators, depending on the uses and types of buildings.

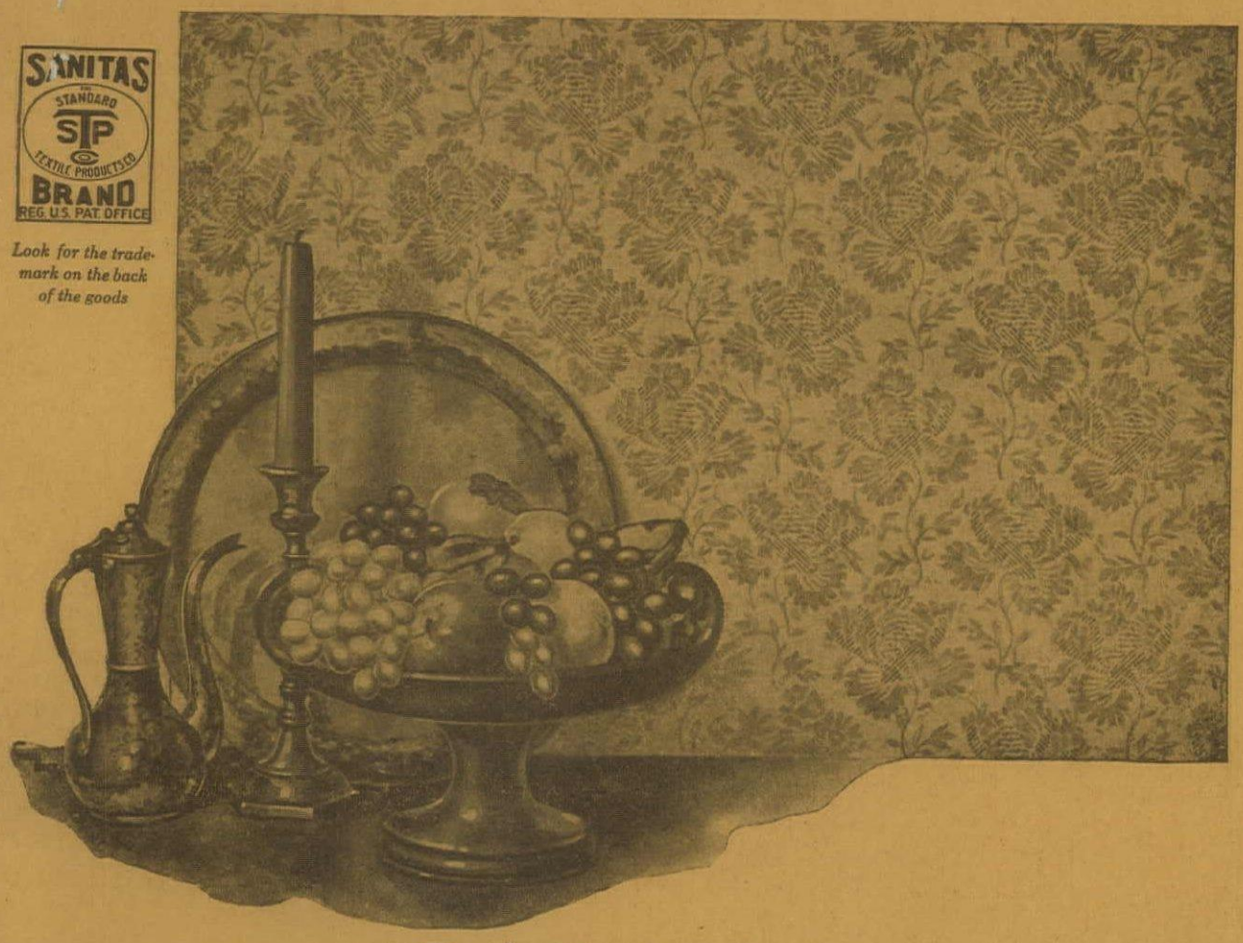
The experience of our engineers is available to all architects when planning Truscon Window installation. Ask us about Truscon National Erection Service.

TRUSCON STEEL COMPANY
YOUNGSTOWN, OHIO

Warehouses and offices from Pacific to Atlantic
For addresses see phone books of principal cities
Canada: Walkerville, Ont. Foreign Div: New York

TRUSCON
STEEL WINDOWS

Specifications of most products advertised in THE AMERICAN ARCHITECT appear in the Specification Manual



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Enamel Finish plain colors and tile effects, for kitchens, bathrooms, laundries, etc.

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PEERLESS

Dome Damper

The Smoke Goes Up the Chimney

~ The Heat Into the Room

TOO often the reverse condition is true—the heat goes up the chimney, the smoke into the room. Because of this, the old-fashioned fireplace had to be given up; its spirit of cheer and hospitality could not offset the lack of heat and difficulty of control.

Today it is different. The fireplace has returned to its rightful own. The Peerless Dome Damper has overcome its faults, and restores its charm to the home.

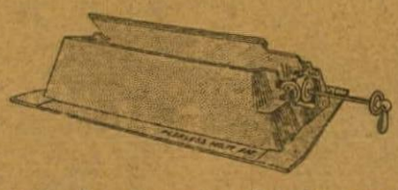
No other method of heating is needed in a room warmed by a fireplace with Peerless Dome Damper. The heat is ample and thorough; and reaches every part of the room. The fireplace becomes efficient; more heat is obtained from the same fuel, and because the fire can be regulated from kindling to ashes, fuel is conserved.

Make the fireplace part of the homes you plan and then make it useful, and practical, by adding the Peerless Dome Damper. Blue print charts showing plan of installation, and full particulars, upon request.

The Peerless Ash Trap shown above is automatic; weight of the ashes falling from fire opening it, and doors close themselves. Eliminates all unpleasantness from fireplace care.

The Peerless Ash Pit Door is made in several styles; all from best materials with standard Peerless workmanship. The one illustrated is No. 3.

Dealers: Write for our attractive plan



Peerless Dome Damper is made in three types, identified by their numbers, No. 17, 21 and 22. They are alike in all respects except means of operation. No. 22, illustrated above, is operated from the side of the chimney breast. Other types are regulated from face of fireplace. and inside top of fireplace opening. Strong and durably made of finest heat-resisting materials.

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COAL CHUTES
ASH TRAPS
ASH PIT DOORS

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