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H. E. HARMAN, President. E. R. DENMARK, Editor.

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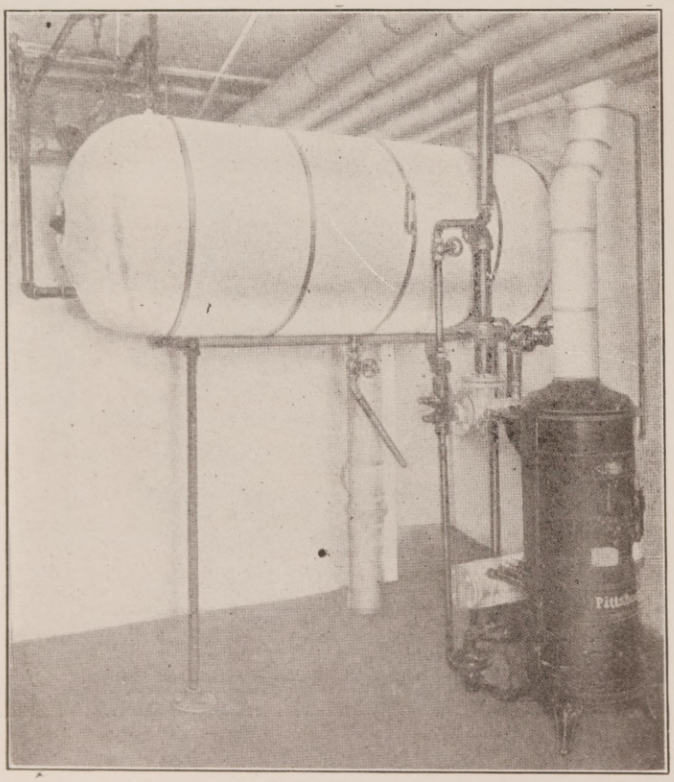

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THE EDITOR'S PAGE

SOUTHERN BOY AT CARNEGIE TECH WINS PRIZE OF $100.00.

William E. Morgan, of Salisbury, Md., a student at Carnegie Institute of Technology, Pittsburgh, was awarded the first prize of $100.00, and Thomas F. Moffett, of Saranac Lake, N. Y., a Master Plumber, was awarded the Second Prize of $50.00 in an essay contest conducted by Carnegie Tech on "The Use of Vitrified Clay Pipe in Plumbing Systems." The prizes were donated by the Eastern Clay Products Company.

The contest was nation-wide, and the quality of the papers submitted by college students and craftsmen was exceptionalily high, according to an announcement. The winner, Mr. Morgan, is a sophomore student in the Plumbing, Heating and Ventilation Courses in the College of Industries. Mr. Moffet, second prize winner, was for nine years a Master Plumber in the Bronx District in New York City.

Professor S. E. Dibble, Head of the Department of Plumbing, Heating, and Ventilation was chairman of the jury of judges, whose other mebers were: W. J. Woolley, Secretary-Manager, of the National Trade Extension Bureau, Evansville, Ind; Joseph A. Welden, Welden-Kelley Co., Master Plumbers, Pittsburgh; and John T. Morris, Director of the College of Industries, at Carnegie Institute of Technology.

CONCRETE FLOOR TESTS.

The hollow tile and reinforced concrete floors of the Arlington Building, Washington, D. C., occupied by the U. S. Veterans Bureau, were tested by loading them and measuring the deformation.

In this structure, the tiles were placed in rows and spaced four inches in each direction. Reinforcing steel was placed in these spaces near the bottom of the slab in the panel and near the top of it across the supporting beams. The concrete was poured around the reinforcing bars and into the open ends of the tiles.

The building was intended for a hotel but was later turned over to the government for the use of the Veterans Bureau. The original design load of 75 pounds per square foot was increased to 100 pounds per square foot and the increased strength obtained by a two-inch layer of concrete over the tops of the tiles.

The panels of the floor were loaded with sand bags up to 380 pounds per square foot and the stresses in the steel and the concrete measured. The maximum stresses developed in the steel reinforcement were about 27,000 pounds per square inch. The effect of time under load was to increase the stresses in the reinforcing steel from 15 to 20 per cent. This was particularly pronounced in the first 20 hours and was comparatively small later.

The panels tested varied in the ratio of length to width. It was found that with the increase of that ratio, the stresses in the reinforcing steel at the bottom of the slab and those at the top of the slab (across the girders) increased in the direction of the short span and decreased in the long one. The stresses in the girders were lower than those in the slab.

The factor of safety of the structure was greater than two. This factor is the ratio of the maximum load the structure can sustain to the load which can be safely allowed when the building is in use.

These tests are described in Technologic Paper No. 236 of the Bureau of Standards, copies of which can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. The price is 15 cents.

WINNERS IN HOSPITAL CONTEST.

Butler & Rodman of New York City received the first prize in the international competition recently conducted by **The Modern Hospital** magazine for the plans of a small general hospital. Three awards of $500, $300 and $200 and two honorable mentions were made. First and second prize designs are illustrated in this issue.

Second and third places in the contest were won by John Roth of Atascadero, Cal., and Ernest Hoedtke of Cambridge, Mass. Selection was made from fifty-one sets of plans submitted by hospital architects of the United States, Canada and England, judgment being on the basis of economy in construction and operation, integrity of designs, health values and flexibility.

INDEPENDENT PRESBYTERIAN CHURCH
SAVANNAH, GA.

SOVTHERN ARCHITECT & BVILDING NEWS

OWENS HOUSE, SAVANNAH, GA.

Colonial Houses of the Old South

(Illustrations from Savannah, Ga.)

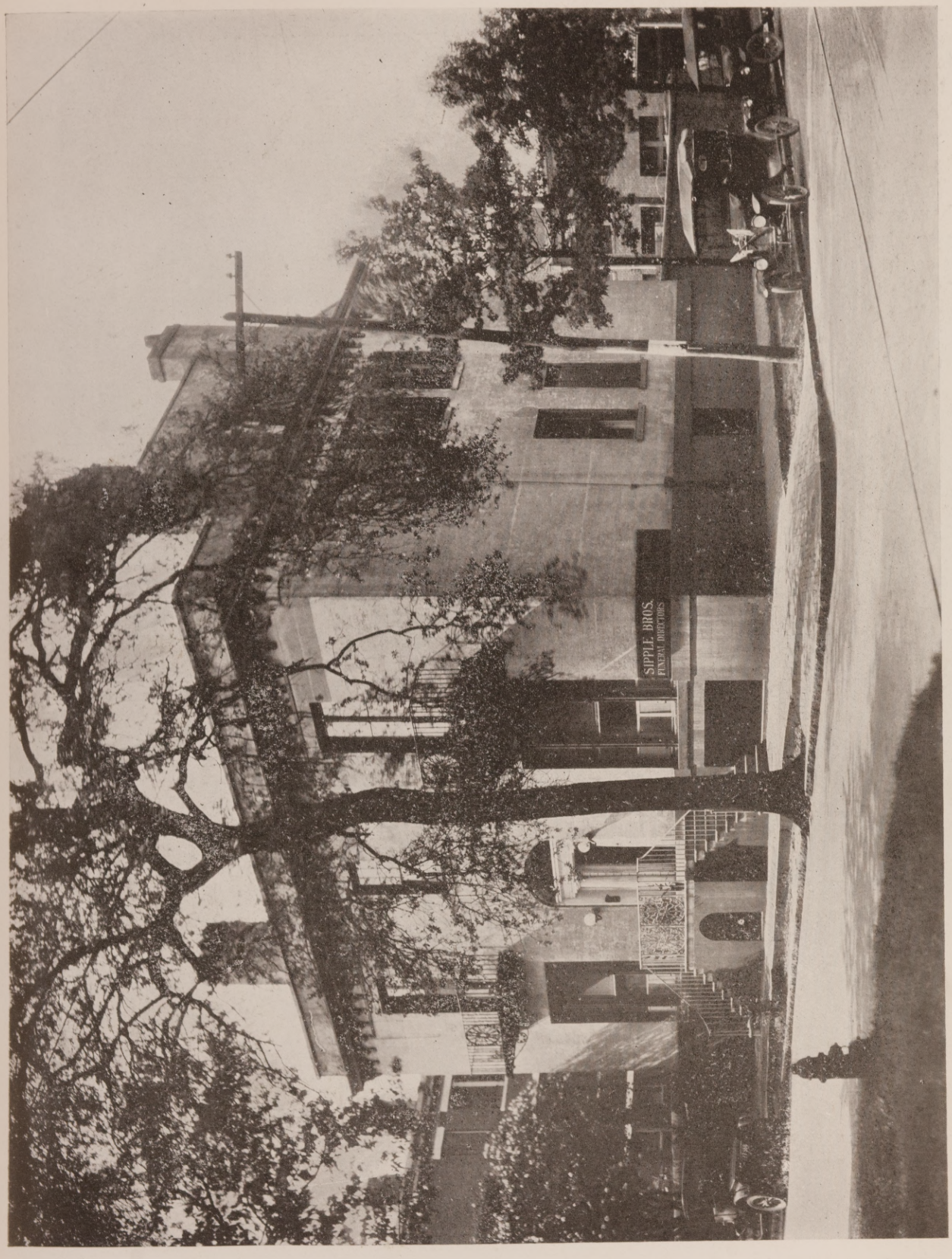
By Hattie Herbig.

THE early architecture of Georgia like that of Alabama and Mississippi was subject to a large degree to the influence exerted by two distinct nationalities—the French and English. The English settlers who came south were, as a class, much richer than the French Huguenots of the same period and naturally were able to build finer houses than the less fortunate French settlers, and we find that the Georgian ideas of the English were well established throughout the regions of the far south. The early settlers of this section having less hatred in their hearts for the Mother country than their Northern brothers, were ever looking to their mother land for prototypes and continued to do so even after the Revolution, which accounts for the presence of the colonnaded houses in the lower states. This style is nothing less than an off-shoot from the Classic Revival which raged in England during the last of the eighteenth century and appeared for the first time along the east coast of America about 1800. It became very popular and being well suited to the climatic conditions soon spread through the entire South from the Atlantic to the Mississippi.

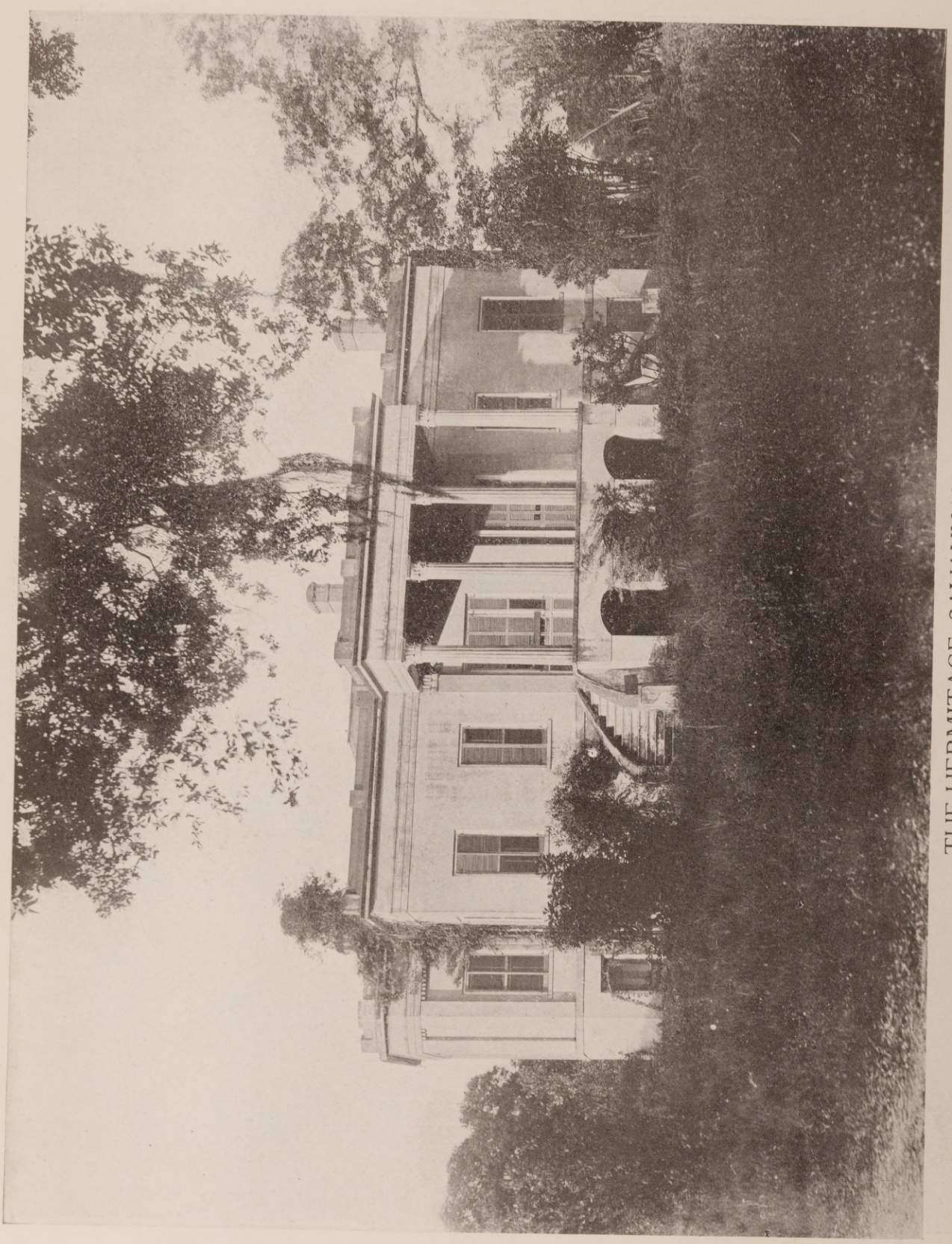
The white-columned houses, although of foreign origin, were so truly suitable to the South that in time the idea became absorbed by the Southern planter and builder as to be almost a natural product resulting from the demands and taste of the people of this section.

Savannah, Georgia, although a seaport town of the Colonial period does not offer very many specimens of any value, this perhaps is due to the fact that this city was practically devastated by fire upon two occasions, however, there are

TELFAIR ART GALLERY, SAVANNAH, GA.
BUILT 1815-20, JAY, ARCH.



MINUS HOUSE, ORLEANS SQUARE
SAVANNAH, GA.



THE HERMITAGE, SAVANNAH, GA.
BUILT 1830

McALPIN HOUSE, SAVANNAH, GA.
BUILT 1820

several old houses that are worthy of study. While these houses are entirely different in exterior aspect they are suggestive of the Carolinas, especially of Charleston, and the city itself reminds one of Charleston. There is Bull Street, named for Col. William Bull, of Carolina, who laid out the city. There is Drayton Street, named for Thomas Drayton, of the Ashley River, and St. Julian Street called for James St. Julian, a friend of the Georgia Colonist. The houses at Savannah nearly all belong to a later period than the fine old houses one sees at Charleston, and the observer is constantly running into old Georgian doorways set in the plainest clapboarded houses, fanlights, bits of old ornamental iron work and other interesting details.

The oldest structure of special interest in Savannah today is perhaps the Exchange Building, which begun in 1799, has been the scene of many varied functions for over a century. It has been used as a theatre, a ball-room, and a place of general assembly on patriotic occasions as well as for commercial purposes.

Next to the Exchange Building the oldest and without question the most interesting piece of work in Savannah are four residences which were built about the same time and by the same architect and therefore may be classed together.

These are commonly spoken of as Scarborough house, which is situated in Yamacraw, the oldest section of the city; Owens house, the Telfair residence, now the Telfair Art Gallery, and Bulloch house on Orleans Square.

All of these houses were built by an English architect by the name of Jay who did considerable work in and around Savannah early in the nineteenth century. The Owens house is known to have been built in 1815, the Bulloch house was completed in 1818 and the other two about the same period. All of these houses are built of brick, which we presume were brought over from England, however, it is known that native brick could be had as early as 1820. The construction of the Owens house is of a different material, being a species of concrete or artificial stone composed largely of pounded oyster-shells. We are told that this material is different from what was called "Tabby" houses in South Carolina and Florida, which was a combination of a natural limestone with marine shells and coral for the conglomerate. The Owens, Telfair and Scarborough houses are very similar in exterior design, although quite differently proportioned. It is easy to judge that the same architect designed all three houses and to some degree express the architectural personality of their English designer. Of the three houses we would say that the Scarborough is the most interesting. Although this house has been put to the very roughest treatment and is stripped of all the interior adornment, marred by the elements, and unfortunately situated in the heart of a rough district it still has an air of repose and dignity.

All of the houses built by Jay in and around Savannah were square in plan, with the kitchen and servants' rooms in an ell to the rear. All the rooms were large, the feature of each house, however, is the staircase, for in the four houses mentioned each staircase is constructed differently. In the Scarborough house the staircase, which is excedingly wide and of a rather heavy design, rises abruptly immediately in front of the entrance, leaving an open space to the rear of it; the Telfair staircase rises in very much the same manner, but is constructed differently; the staircase of the Owens house rises about half-way centre of the hallway to the rear of a colonnade consisting of four gold-capped Corinthian columns, and ascends to a landing, on either side of which second runs arise completing the ascent to the story above, the stair-opening thus made forming a sort of arcade through which those on the upper story can see what is going on below. The staircase of the Bulloch house is spiral in character.

One of the best examples of early houses in this section is the "Hermitage," located about six miles from the city on a large plantation on the Savannah River. The house, more or less Georgian in character, with a tendency toward such thoughtful work as could be produced in the locality at such an early period, represents on the whole a later epoch than the buildings we have been considering. It also represents a civilization later than that of the Colonial period, however the house is quite interesting and its construction of native brick adds to its importance in this discussion. The house was built in 1820.

While the city of Savannah may be somewhat diesappointing, due perhaps as we have said before to the two fires which the city experienced, the student or other parties interested in the old houses of the South that are typical of our early ancestral builders will find some very interesting specimens of country houses in the surrounding country that point to that mode of life peculiar to the far South prior to the Civil War.

REVIEWING CVRRENT ARCHITECTVRE

Residence Work

By

OWENS JAMES SOUTHWELL, Architect

ATLANTA, GA.

HOUSE OF B. OHLMAN, ATLANTA, GA.

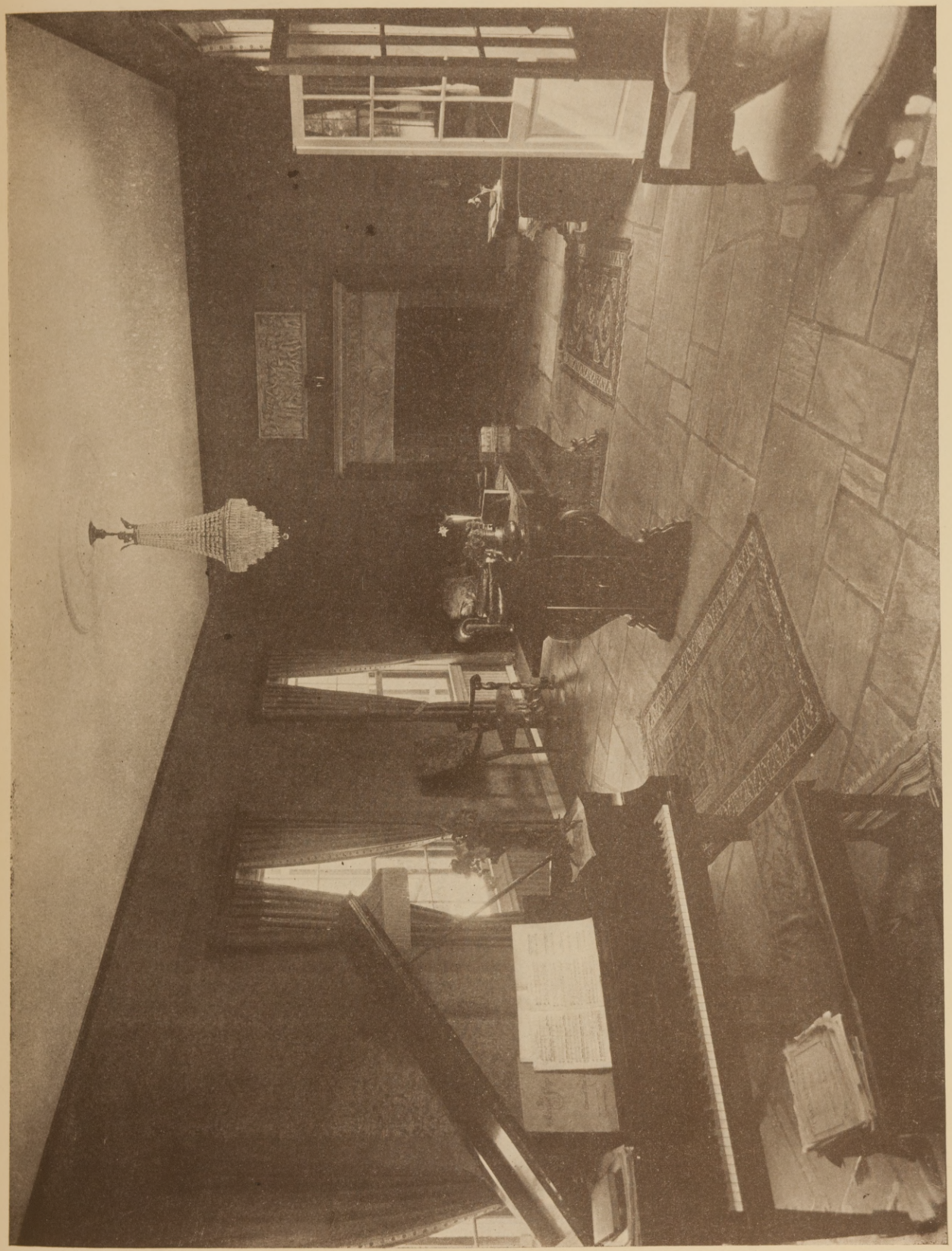
H. HORNBOSTEL, CONSULTING ARCHITECT.
OWEN JAMES SOUTHWELL, ARCHITECT.

DETAIL OF ENTRANCE HALL

HOUSE OF B. OHLMAN, ATLANTA, GA.

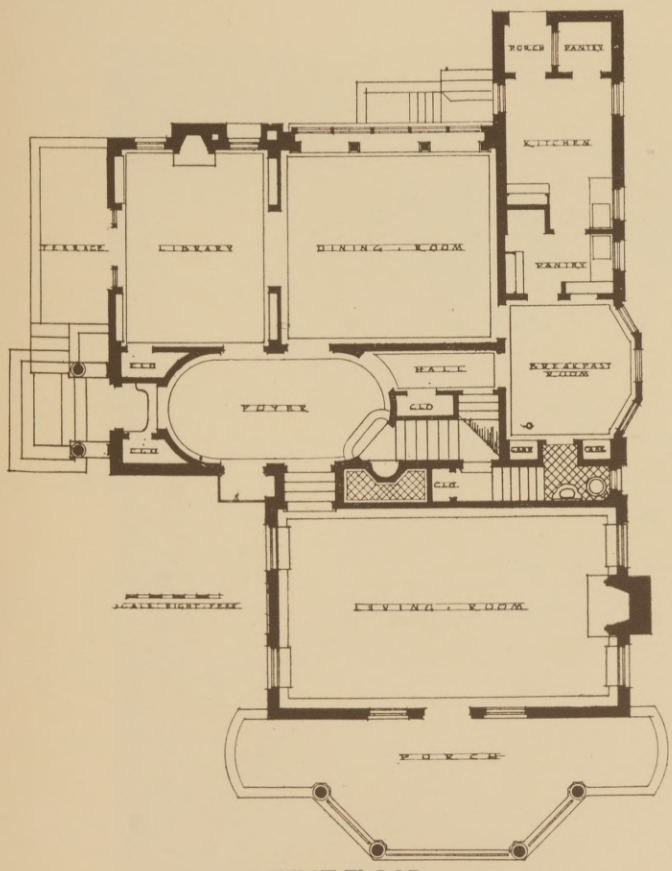
H. HORNBOSTEL, CONSULTING ARCHITECT.

OWEN JAMES SOUTHWELL, ARCHITECT.

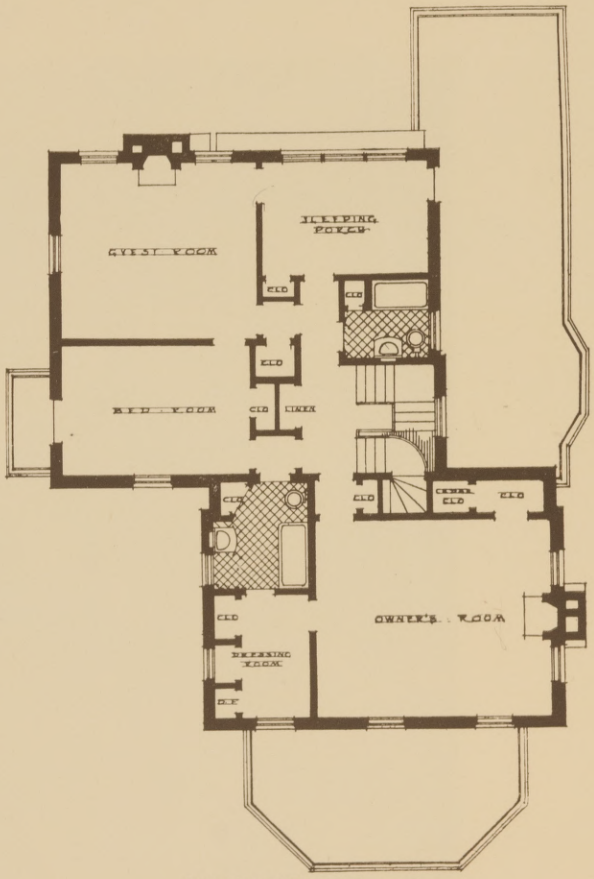


LIVING ROOM
HOUSE OF B. OHLMAN, ATLANTA, GA.
H. HORNBOSTEL, CONSULTING ARCHITECT.
OWEN JAMES SOUTHWELL, ARCHITECT.

VIEW OF ENTRANCE ELEVATION
HOUSE OF I. S. HOPKINS, ESQ., ATLANTA, GA.
OWEN JAMES SOUTHWELL, ARCHITECT.



FIRST FLOOR



SECOND FLOOR

HOUSE OF I. S. HOPKINS, ESQ., ATLANTA, GA.

OWEN JAMES SOUTHWELL, ARCHITECT.

LIVING ROOM

LIBRARY

HOUSE OF I. S. HOPKINS, ESQ., ATLANTA, GA.

OWEN JAMES SOUTHWELL, ARCHITECT.

DINING ROOM

DINING ROOM LOOKING TOWARDS BREAKFAST ROOM

HOUSE OF I. S. HOPKINS, ESQ., ATLANTA, GA.

OWEN JAMES SOUTHWELL, ARCHITECT.

CHIESA DELLA SALUTE, VENEZIA
Built by B. Longhena

Churches of Northern and Central Italy

THE spacious dome-covered church, Santa Maria della Salute, erected in 1631-56 in Venice by Bald Longhena in commemoration of the plague in 1630, is one of the most conspicuous objects in view from the Piazzetta. The octagonal central portion of Santa Maria, which has a portal in the style of a Roman triumphal arch, is surrounded by an ambulatory and flanked by six hexagonal side-chapels. The principal dome, round without but octagonal within, rises above a drum pierced by sixteen large round-arched windows. On the south side of the church above the square choir with its rectangular altar-recess, is a second dome, flanked by two square towers. The interior contains excellent works by Titian (from Santo Spirito).

The church Redentore was begun in 1577 by Palladio after the great plague of 1576 but was not finished until 1592. This much vaunted edifice is perhaps the most complete of Palladio's churches, with a handsome flight of steps on the strictly classical facade and two slender round towers beyond the dome above the crossing. (In the illustration on the following page may be seen a very small portion of the dome by looking to the left about midway the picture. The aisleless interior is especially charming.

The Chiesa di S. Maria della Pace and Chiesa di Santa Susanna illustrated on the following pages are excellent samples of church edifices built about the same period as the churches above mentioned.

CHIESA DEL REDENTORE, VENEZIA
BUILT BY ANDREA PALLADIO

CHIESA DI SANTA SUSANNA, ROMA.

BUILT BY C. MADERNO

CHIESA DI S. MADRIA DELLA PACE, ROMA
BUILT BY PIETRO DA CORTONA

First prize in the Modern Hospital Competition went to Butler & Rodman, New York whose design, the perspective of which is shown above, is simple and economical of construction.

A Simple Solution of the Small General Hospital Problem

In any architectural design, so even more in the case of a hospital is it essential, first of all, to work out a plan which shall satisfy the needs set forth in the program. I have never forgotten the remark made to me by a great French architect: "On a good plan you can make forty good elevations, but first you must have the good plan, and on a bad plan no good elevation is possible." This is a precept too often neglected by architects who start out with the idea of a beautiful exterior and forget that it can only proceed from a good plan.

In studying the plan we were at first tempted by a solution along the lines of tuberculosis sanatoriums in which every room would face the south. The large number of single rooms and the small size of the wards seemed to point to this arrangement which would be most attractive from the point of view of the patients, but it soon became apparent that the great length of the building from east to west would increase the labor of the nurses beyond all reason, while minor objections were the excessive length of heating and plumbing lines; so we abandoned the idea in favor of the plan adopted, in which every patient's room has east, west or south exposure.

This plan appeared to us especially economical in that it permitted the central location of stairs, elevators and service rooms, and still provided for the segregation of the different departments, and allowed for future expansion in three directions.

We assumed that the hospital was to be built in a climate where protection from cold winds should be considered, and therefore selected a site on ground rising gradually toward the northwest. This permitted us to place the business, admitting and out-patient sections of the hospital in the basement on the east, while the slope permits of access to the ambulance entrance on the main floor level. We felt also that it was desirable to place the entrance away from the operating rooms, so that the incoming patient need not be greeted by the blank stare of operating room windows.

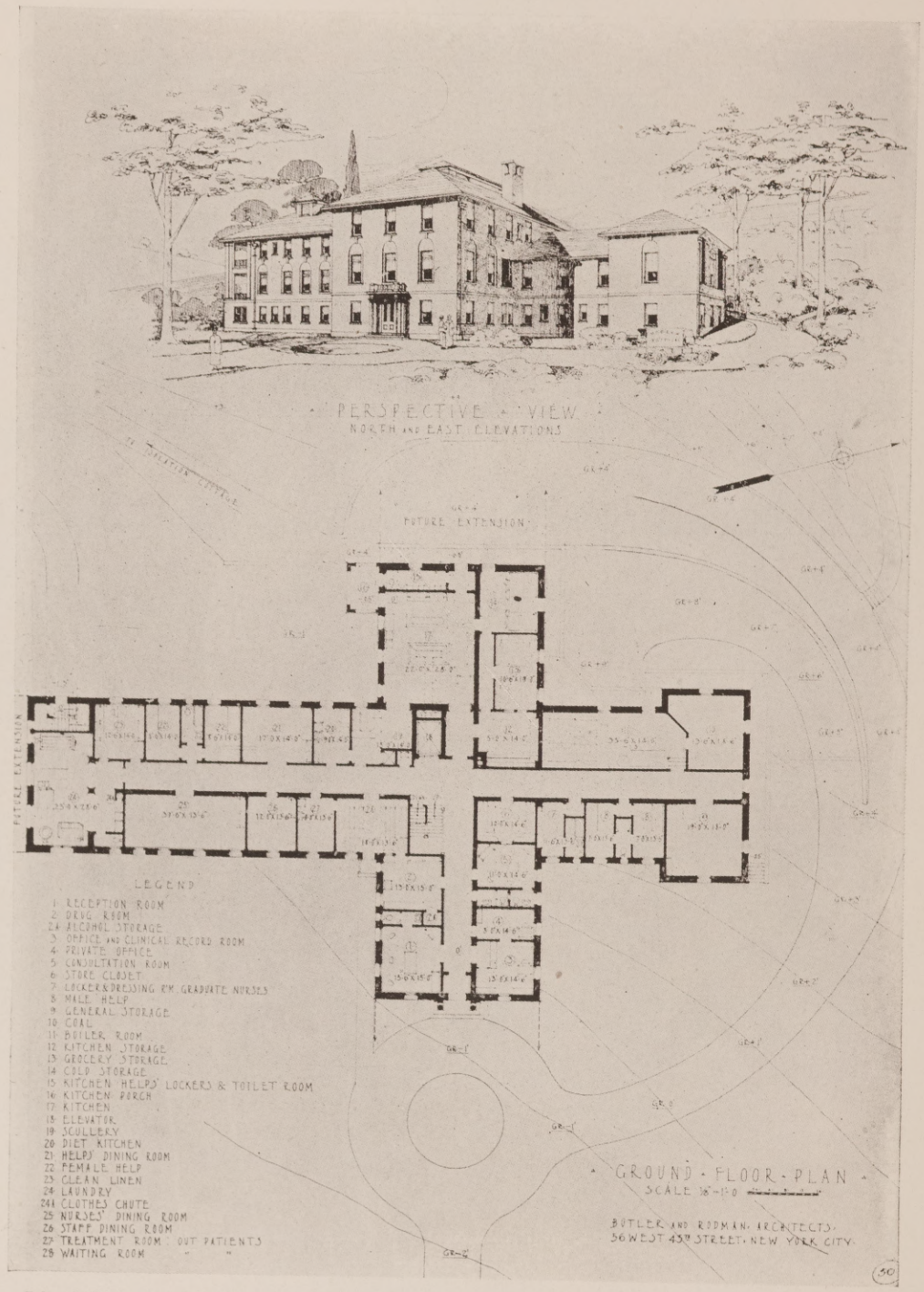
The placing of kitchen and laundry was also a difficult problem. In a larger hospitals these services may easily be removed from the hospital proper, but when that is impossible for reasons of economy, as in this case, it reduces itself to the question of what are the least obectionable locations.

Of all the patients, the children would be least annoyed by the noise of the kitchen, so it has been placed under the children's ward, and for a similar reason we placed the laundry under the main airing balcony, where its presence would be least noted. Other points in plan arrangement which appeared to us worth while are the placing of the ambulance entrance out of sight of the patients, and the placing of the x-ray service and laboratory near to the operating department.

Our design for the exterior provides for stucco on brick or concrete walls with roof of tile or slate. The number of beds called for would imply that the hospital was to be designed for a town of approximately ten thousand inhabitants, where a plot of ground of ample size would certainly be available, and we felt that a cream colored building with green window trim and a red or green roof, surrounded by lawns, with trees and shrubbery would be an addition to the beauty of the town. The modified colonial architecture adopted for this design seemed to lend itself to the exacting requirements of the hospital plan to produce the most agreeable exterior at least expense.

We believe that this design would be reasonable in cost in view of the fact that all spans of girders and beams are relatively short; it will be noted that one of the corridor walls in each wing has been carried up as a bearing wall, in order to avoid the use of steel columns and heavy girders. The construction would of course be fireproof throughout, the use of steel or reinforced concrete depending upon local conditions. The total cubic contents of the building figured from the basement floor to the average height of the roofs amounts to 415,000 cubic feet.

Butler & Rodman.



John J. Roth of Los Angeles won second award in the Modern Hospital Competition on a set of plans which will make for efficiency in operation and economy in nursing service. The perspective of Mr. Roth's designs, Italian Renaissance in style, is unique and refreshing in that marked attention is given to form and color.

A Building Cheerful in Appearance and Compact in Design

THE plan of the small modern hospital should be intensely flexible, so executed that it will be able to take care at any time of any kind of case that offers itself.

The accompanying design was prepared for an average American community of about 5,000 people which would also receive the patronage of the surrounding country. In planning this building I have endeavored to produce an architectural design for the exterior of the building that would not be austere in appearance but one that would rather create a more cheerful impression and express an atmosphere of peace and restfulness. The building has been placed well back from the sidewalk and has an attractive landscaping with broad lawns, not too formal in design.

The floor plan is arranged so that future additions may be made to the building so as not to disturb its present arrangement; nor will such future additions cut down the lighting or ventilating or any part of the present building.

In its plan, emphasis was placed on centralization so as to minimize the walking distance of the nurse in giving service to patients. With distance cut down, a nurse will naturally be able to take care of more patients with the same effort, and in this way economize in the overhead operation. Airing porch space was generously distributed so as to be easily reached by all patients, making it feasible to have each bed readily rolled into the sunshine; awnings may be erected over any of these porches. Covered porches are not desirable owing to the amount of light, sacrificed to the porch roof and resulting depressive atmosphere in the room.

From the point of construction the two story type is more economical than a taller building, where ground is not expensive and a fairly good-sized lot is obtainable at a reasonable cost. The walls of the one story wing should be built of sufficient strength to carry a second story for future extension of the plant. This would add but slightly to the cost of construction. The walls of the exterior of the building could be constructed either of reinforced concrete, hollow tile or common red brick, with a finish surface of cream colored stucco, the type of wall construction depending upon cost per unit in the locality in which the building is to be erected. Floors are of reinforced concrete slab construction with terrazzo or magnesite finish; marble is used in main corridors. Subdued colors have been adopted for all walls and decorations; little or no woodwork has been employed as trim. Casement sash of steel type employed throughout, thus giving a maximum amount of ventilation in the warm summer months, easily operated opening and no rattling of sash. The roof over flat portion has a quarry tile surface installed over reinforced concrete, so that if additional story is added, this floor need not be disturbed; the ceiling under is suspended to allow for ventilated air space for summer months. With this type of construction this building should be erected in any community for $125,000.

JOHN J. ROTH.

SOUTH ELEVATION

EAST ELEVATION

PERSONAL MENTION AND COMMENTS

Messrs. Jones & Roessle, of New Orleans, and Clarence E. Olschner, of Shreveport, announce the formation of a co-partnership. They will continue the practice of architecture under the firm name of Jones, Roessle & Olschner, Architects, with offices in the Maison Blanche Building, New Orleans, La., and the Ardis Building, Shreveport, La.

Vinson B. Smith, Jr., Architect, Evans Building, Gulfport, Miss., is now revising his files of architectural reference and specifications, and is very desirous of receiving manufacturers' catalogs and samples.

Clarence E. Shepard, architect, has moved his office to 412-15 Huntzinger Building, 114 West Tenth Street, Kansas City, Mo. Manufacturers are requested to send catalogs and samples.

W. W. Sabin, architect, has moved his offices from 1900 Euclid Avenue, Cleveland, Ohio, to 1116 Arcade Building, St. Louis, Mo.

It is announced that the partnership formerly existing between A. B. Boyer and I. A. Baum, architects, has been dissolved, Mr. Boyer retaining his office in St. Louis, Mo. Mr. Baum has taken over the architectural commission in connection with the Columbia Mutual Tower, Memphis, Tenn., and has temporarily opened an office in that city.

Alexander W. Norman, architect, announces the opening of an office at 306 Louisiana Building, New Orleans, La.

Study of Floors.

The American Hospital Association Committee on Floors is this year continuing its study on the subect of floors, and solicits samples for testing, these tests to be made the basis of a further report to the annual meeting of the Association. Particulars may be obtained by writing the Chairman, Frank E. Chapman, 1800 East 105th Street, Cleveland, Ohio. The Committee consists of Doctor Thomas Howell, New York Hospital, New York City, Doctor Charles E. Young, Hospital of the Good Shepherd, Syracuse, New York, Mr. Charles F. Owsley, Architect, Cleveland and Youngstown, Ohio, Mr. J. W. McBurney, Engineer of Tests, Board of Education, Cleveland, Ohio, and the Chairman.

DO YOU NEED A DRAFTSMAN?

If so you will please notify the Editor of this magazine at once. We have in our files the name of an experienced draftsman at Knoxville, Tennessee, who desires position with a well established firm. Immediate location desired.

WILLIAM HOLABIRD

THE death, on July 19, 1923, of William Holabird, F. A. I. A., marks the passing of one who has been an outstanding factor in the art of building construction during the past four and one-half decades. During that period more advances have been made than in the entire previous existence of the world. To Holabird and Roche can be attributed the invention and designing of the first steel-skeleton frame building, the Tacoma Building, in Chicago, which revolutionized building construction. They also devised the multi-basement level building and successfully solved the construction difficulties involved. With this leadership in structural development they have maintained a most enviable position as planners and designers of important buildings.

William Holabird was a commanding figure. Large, physically and mentally, he possessed great energy and indomitable persistence in combination with an ability to secure and retain the confidence and respect of his fellows.

Born in New York State on September 11, 1854, Mr. Holabird was graduated from the High School in St. Paul, Minn. In 1873 he entered West Point, remaining there two years. Afterward he came to Chicago and entered the office of W. B. L. Jenney, remaining there a number of years before organizing the present firm of Holabird and Roche.

Mr. Holabird is survived by his widow, Mrs. Maria Augur Holabird, one son, Colonel John A. Holabird, and two daughters.

Adequate House Wiring Is Measured in Terms of Switches, Convenience Outlets and Elexits

Upon the Number, Type and Location of These Devices Depends the Convenience to be Derived from Electrical Service in the Home—Intelligent Planning to Meet Future Requirements and Demands Means a Greater Value for the House.

By Charles H. Huntley.
(General Electric Co.)

TO firmly have convenience outlets and three-way switches established themselves as essential features of any well-planned house wiring system that the principal question in regard to them confronting the architect and builder is how many there shall be and where they shall be placed in any house that is being designed.

The answer to the question naturally varies with the individual characteristics and needs of the building; but in all cases the determining point is what will give the greatest possible degree of convenience to the occupants of the house.

In fact, it would be difficult to give a better definition of complete house wiring than to say that the term means provision for all the electric lights and all the electric appliances that the builder or any subsequent occupant may wish to use, so arranged that a maximum of convenience is obtained. This is a broad definition; but it will be noted that it inevitably includes an adequate number of convenience outlets and of switches of the proper type, so placed as to afford the greatest convenience in use.

The three-way switch is essential where convenience will be served by the ability to turn on or off a light, or any number of lights on the same circuit, from two places. There are numerous instances in which this is ultra desirable, as, for example: the upper hall light from the lower hall and the upper hall, thus making a trip up or down the stairs, as the case may be, unnecessary; the living room ceiling or wall lamps from each entrance to the room; the dining room light from each entrance to the dining room; the garage light from the garage and from the kitchen or rear hall. Any number of similar possibilities and needs will present themselves on a moment's thought.

A switch as the side of each doorway leading to a room gives control over the lights of the room at the most convenient place—where the lights can be turned on without the necessity of crossing a dark space to do so, and turned off after the room is left behind. Emphasizing the fact that the correct place for such a switch is at the side of the door—the knob and lock side—may seem like calling attention to something that is very obvious. Yet in any number of houses wired a few years ago it is necessary to cross an unlighted room to get to the switch that governs the lights of the room. Instances are not lacking where doors have been so hung that they swing in front of a switch or even in front of a bracket lamp; all of which, by the way, is one of the proofs of the fact that the wiring plans should be made an integral part of the house and not dealt with as a separate feature.

The four-way switch gives an additional point of control to the two provided by three-ways. With a four-way installed between two three-ways, any light (or any number of lights on the same circuit) can be operated from any three points. It is less commonly used than the three-way; in fact, conditions do not ordinarily call for employing it to anything like the extent of the three-way. Yet its possibilities should not be overlooked by any architect or builder.

It gives him an additional means of increasing the convenience of the wiring system. If, for instance, it is desired to operate the dining room light from the dining room itself, from the living room and from the kitchen, a four-way in the dining room placed between one three-way in the living room and another three-way in the kitchen, will make it possible to do so. A similar arrangement may be applied to the lower hall light, providing for its control from the living room, the

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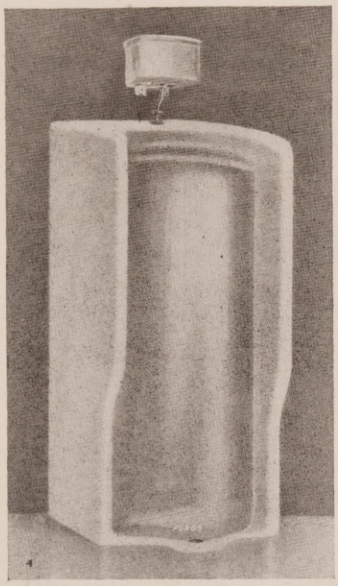

The difference in grade between Fords Porcelain Ware and the ordinary porcelain ware can readily be told at a glance. Its pure white, highly glazed finish, both inside and outside, lends the appearance of cleanliness, sanitation and refinement so much desired for the pantry, kitchen and bathroom.

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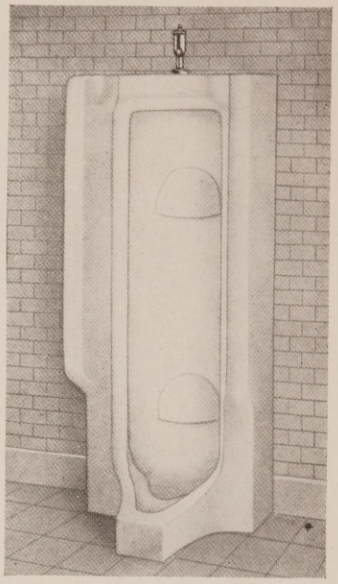
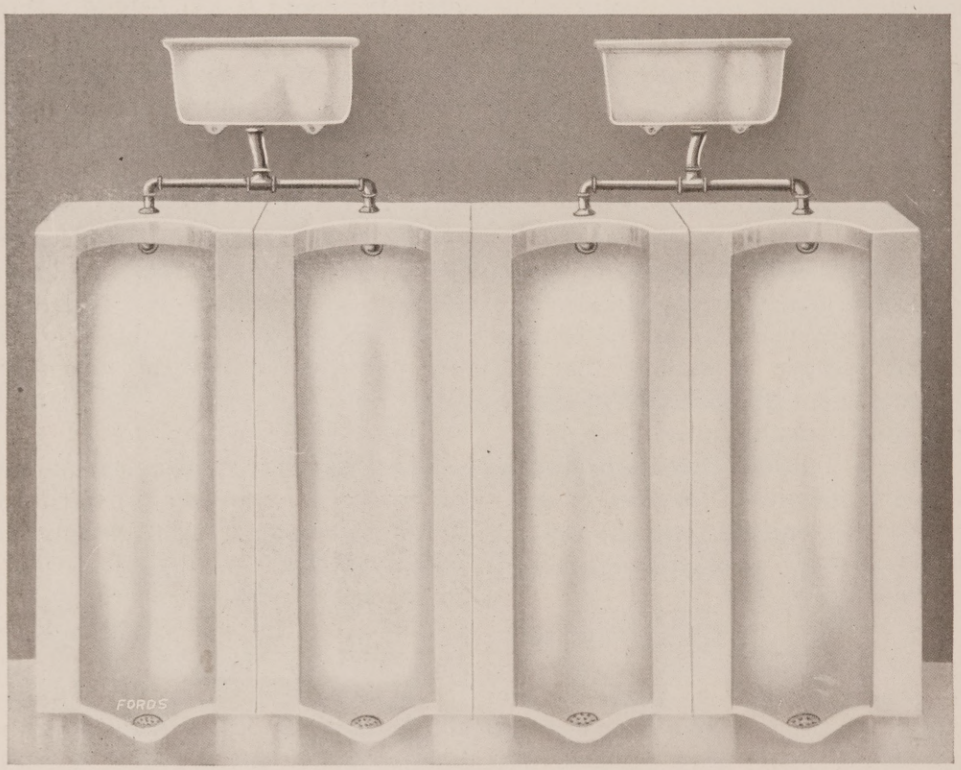
carries quality all through, as well as showing on the surface. The materials used in the manufacture are the best that money can buy. We have learned by experience that it pays in the final analysis to spare no expense to produce the highest quality products.

Fords Porcelain Ware costs very little more than other brands and is well worth the difference.

Let us tell you about our special glazing process and other interesting facts regarding Fords Porcelain.





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hall itself, and the upper hall. It is important to remember that as many points of control as desired may be had by the use of four-way switches. Any number may be installed between the two three-ways, and each gives an additional point of control. To what extent it is wise to go in providing a switch to control a light when the light cannot be seen from the switch, is something for each architect and builder to decide.

The surface switch long ago began to give place, in most installations, to the flush type, and the gang plate covering two, three or even more switches is supplanting the single plate for each separate switch. Switch plates, either single or gang, may now be had not only in a variety of finishes of brass, but in tints to match the walls.

The tumbler switch, which is made in both surface and flush types, is coming into vogue, bringing with it a greater degree of convenience. Possessing all the good qualities of any other type, it has the advantage of easier operation. It operates by the movement of a small lever which may be moved by the elbow if the arms are full of parcels.

As with switches, the number and location of convenience outlets depends on the size, shape, etc., of the rooms. For the benefit of those who are interested in specific suggestions, however, the following recommendations made by the Wiring Committee of the National Electric Light Association are given:

Living Room—Two double outlets in the mantel shelf, one near each end, for mantel lamps or candles and electric fans. Three to five outlets to provide for table and floor lamps, electric piano, talking machine, etc. A sufficient number of these outlets should be installed to take care of any probable rearrangement of the furniture.

Dining Room—One floor outlet near the center of the room for table cooking appliances. Two outlets about five feet apart in the wall to provide for the use of electric candlesticks on the buffet. One outlet near the entrance to the pantry or kitchen, equipped with a double receptacle for attaching cooking appliances on the serving table or tea wagon, and to make it more convenient to attach the portable vacuum cleaner.

Breakfast Room—One outlet for cooking appliances, conveniently located.

Bedrooms—Three or more outlets in each so placed as to permit a rearrangement of furniture and make it convenient to connect portable lamps or bracket lamps on the dresser, dressing table or beds; blanket, warming pad, violet ray, vibrator, curling iron, etc.

For maximum convenience in using small appliances or the vacuum cleaner in bedrooms, one or more outlets should be placed 36 inches above the floor.

Bathroom—One outlet equipped with double receptacle so that an electric heater and hair dryer, or any two appliances, may be used at the same time.

Other rooms, halls, porches, etc., should be wired with every possible use that may be made of that particular part of the house in mind, and outlets provided for both present and future needs.

In all rooms provided with wall brackets for lighting, the outlets should be so located that a rearrangement of furniture is permissible, and so that the brackets may be moved with the furniture and attached to a wall outlet conveniently located. These outlets should preferably be equipped with Elexits.

The Elexits to which reference is made are becoming increasingly popular not only for houses built for renting but for those to be occupied by the owner. The fact that Elexits make it possible to attach or detach a fixture as easily as a floor lamp gives the entire lighting system of the house a flexibility that readily commends them. Wall brackets may be moved without any difficulty at all from room to room or from one position to another within a room, where Elexits are installed, when concentration of light is desired for any occasion or in any place. They also make rearranging the furniture much easier, for in rooms where they are installed the rearrangement is not limited by the necessity of taking permanently attached lighting fixtures into consideration. Side wall Elexits may be covered at any time, if desired, with a picture or wall ornament. It seems reasonable to expect that Elexits will be accepted features of well arranged wiring systems in general in the near future.

Some architects are now arranging wiring plans in such a way that convenience outlets are installed opposite each other in adjoining rooms. This saves the additional wiring involved when each outlet is served separately, as the same leads may be used for supplying current to the two in the same partition wall when situated opposite each other. It is often desirable to install double receptacles instead of single ones. The number of electrical appliances in the household is continually increasing. The future will undoubtedly be marked by a rapid and continual gain. Hence it is wise to make provision for this increased need not only by installing a very liberal number of outlets, but by using double instead of single ones in various places. They occupy no more space than the single ones.

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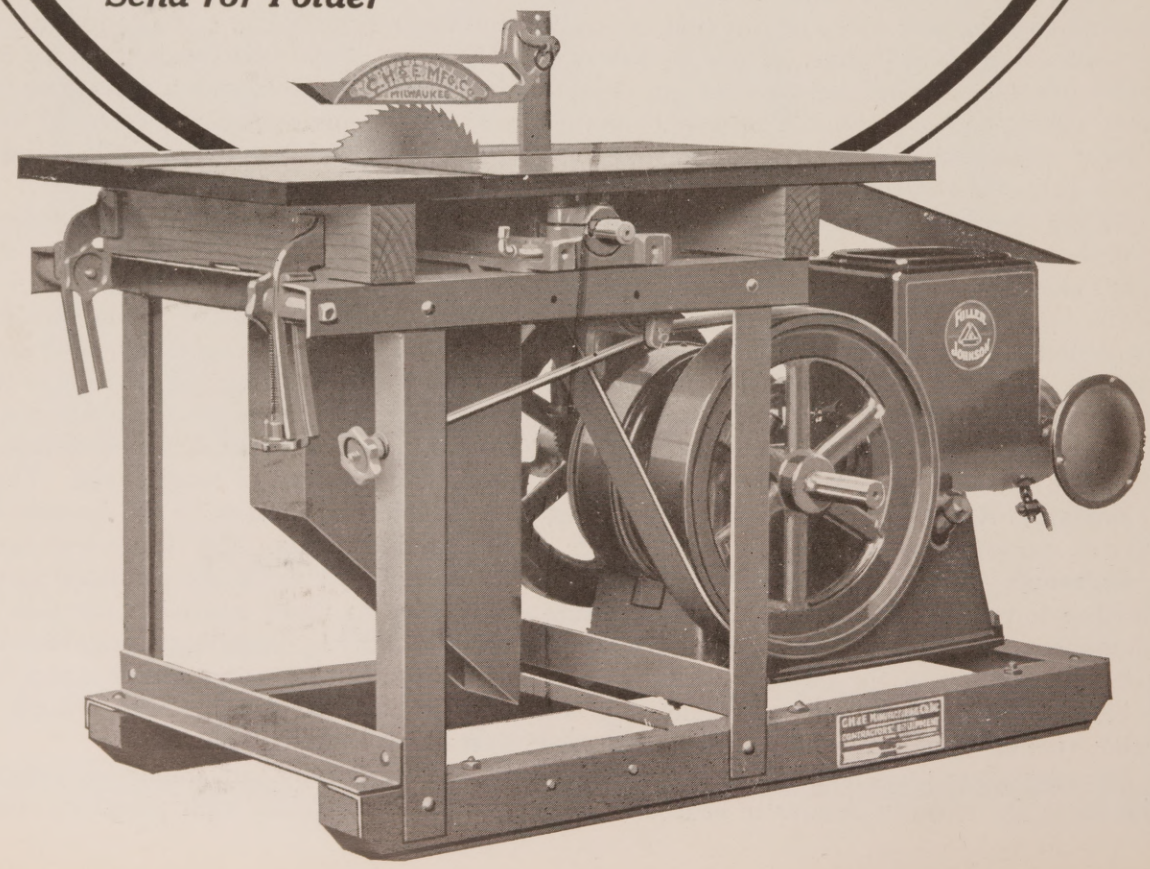

as a necessity. It long since passed out of the luxury class. Being a necessity, it is entitled to the same careful planning that is given the others, and it is as poor a policy to be parsimonious in regard to it as in the case of plumbing and heating. Furthermore, it is quite essential that only first quality materials be used and that the work be done by competent and responsible contractors. The wiring system should not only be designed to meet future as well as present needs, but so constructed as to give lasting, continuous, satisfactory service.

The house of the future will be a "home electrical." There are approximately 8,500,000 wired homes in the United States at the present time, housing about 30,500,000 persons. Many hundreds of thousands more are being wired this year. To prepare today to meet the demands of tomorrow is elementary common sense. The public is constantly demanding more and more electrical appliances and conveniences, and the way is being made easier for the individual houseowner to equip his home with an adequate wiring system by making it possible for him to pay for it, under stipulated conditions, on the deferred payment plan, just as a considerable percentage of purchasers do in the case of a washing machine, an ironer or a dishwasher.

The adequacy of the wiring system is measured in terms of switches, convenience outlets and Elexits, and these devices should have the thought and study of architects and builders to the degree to which their vital importance really entitles them.

FIREPROOF REQUIREMENTS FOR BUILDINGS OF VARIOUS TYPES.

THE following table, compiled from the National Board of Fire Underwriters Building Code, has been published in safeguarding America:

1. The following structures to be fireproof:

Armories
Asylums
Bath Houses (with sleeping accomodations)
City Halls
Colleges
Court Houses
Detention Buildings
Police Stations
Hospitals
Museums
Nurseries
Railway Passenger Stations
Schools with pupils above second story
Theaters

2. When over three stories high the following to be fireproof. When three stories or under, must have fireproof floor over cellar or basement.

Amusement Halls
Churches
Exhibition Buildings
Lodge Rooms
Public Halls

3. When over three stories high. When three stories must have fireproof floor floor over cellar or basement.

Dormitories
Hotels
Lodging Houses

4. When having more than 15 sleeping rooms or when over three stories high. When three stories must have fireproof floor over cellar or basement.

Bachelor Apartments
Club Houses
Studios

5. When over four stories. When four stories must have fireproof floor over cellar or basement.

Dwellings
Tenements
Apartment Houses

6. Mill or fireproof when over four stories or 55 feet. Mill construction not permitted over 65 feet without sprinklers and 75 feet with sprinklers.

Factories
Lofts
Office Buildings
Printing Houses
Stables
Stores
Warehouses
Workshops
Garages

7. The following should be permitted only in isolated locations:

(a) Fireproof,
Oil Houses
Oil Refineries
Rendering Plants
Soap Factories
Smoke Houses
Dry Cleaning Establishments
Laboratories
Buildings for Combustibles

(b) Fireproof or mill if in fire limits or if over 55 feet high. Mill construction not permitted over 65 feet without sprinklers, and 75 feet with sprinklers.

Car Barns
Foundries
Power Plants
Freight Stations
Ice Houses
Refrigerator Plants
Malt Houses
Grain Elevators
Slaughter Houses
Wharf Buildings

How the Name Originated

The name 2-point is a good one. This is proven by the frequent inquiries we receive as to why it is so called. The answer is short: The name is unique and easily remembered. It is quickly said and written. It refers to positive, definite facts, hence carries an appeal to engineers and business-men, the men we wish to reach.

The facts refer to the construction of the product. For many years heat insulators were almost standardized. The heat loss through them was accepted as a necessary evil and no improvement was sought.

Then the idea of using asbestos fibres as a vehicle for loose Kieselguhr occurred to us and was carried to a practical form. Furthermore, the surface of the sheet of Kieselguhr bearing asbestos was mechanically treated to hold great quantities of air in tiny pockets. Thus an insulator was secured posssessing the endurance of felted asbestos to heat, blows, vibration, wearing and all the other deteriorating conditions high temperature insulation must face, yet having highest efficiency.

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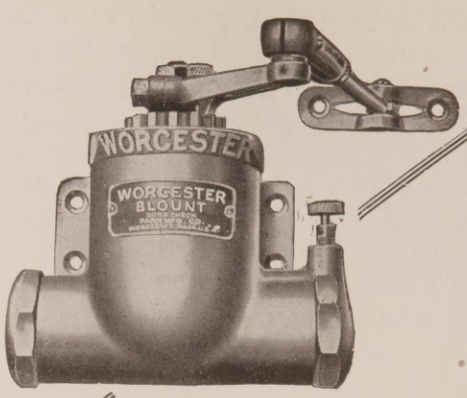

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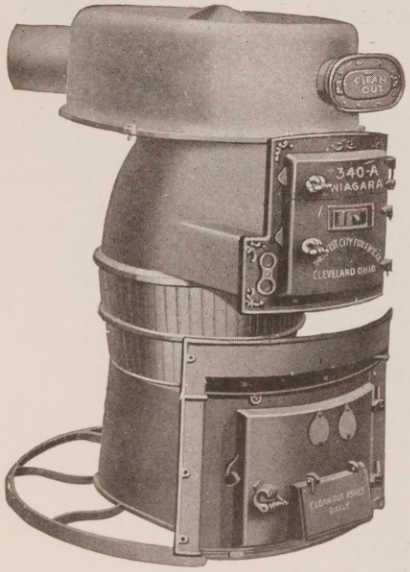

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An Analysis and Discussion of the Principles of Interior Painting

By Frank G. Breyer.*

A—The Object of Painting. (Just What is Desired from the Painted Surface, Fresh and Throughout Its Life.)

B—What Paint Will Produce the Desired Job. What Paint Will Give Us the Results That Our Analysis under A Demand.

C—How Shall That Paint Be Applied.

D—What Can Be Done to Preserve Its Pleasing and Useful Life.

A—The Object of Painting.

I—Pleasing Effects in Applied Paint May Be Analyzed into:

(a) Color and Tint
(b) Brightness
(c) Finish
(d) Balance and Harmony

II—Useful Effects May Be Analyzed into:

(a) Percentage of Light Reflected
(b) Minimum Accumulation of Dust and Dirt
(c) Protection of Surfaces from Marring and Scarring
(d) Sanitary Effect

III—To Maintain the Pleasing and Useful Effects Over a Period of Years.

It's not quite so easy to decide what you'll take and what you'll leave in a paint job when you see listed before you the number of elements that make up the final result, and realize that you can't have them all to the maximum degree. As a matter of fact when the ordinary judgment is arrived at, many of these elements are never consciously in mind. After the job is complete, however, we suddenly realize that we didn't consider Maintenance of the Effect when we chose a flat finish for basement rooms. For example:

In offices or living rooms, where persons spend many hours consecutively, the major stress must be laid on Pleasing Effect and its Maintenance. This demands a dead flat for all large surfaces like walls and ceilings, even at the cost of frequent washing and early repainting and rubbed finish, in the highest class jobs, for the enameled woodwork. In the toilet rooms, elevator shafts, basements and all service rooms, the major consideration is Useful Effect and its Maintenance. Here the maintenance of light reflection and cleanliness at minimum cost determine the character of job.

Let us now discuss the individual items under the Major headings.

I—Pleasing Effects.

(a) Color or Tint

A scientific discussion of color in paint, including the psychological effects, would be highly interesting but impossible to carry to a conclusion in this paper. Three important things must be considered, however. First, that every departure from white, any color whatever, affects the total light reflected. Second, that purity of tint or color has been proven to be of as much importance in the pleasing effect of colored surfaces, as purity of tone is in the pleasing effect of a musical note. Third, that maximum absorption and riddance of ultraviolet light rays, that range of light rays that most harmfully affect the eye, and minimum reflection of these rays are highly important properties.

(b) Brightness

You probably have not been accustomed to think of brightness as distinct from color. You cannot make a pure pleasing tint out of a dull white or a dull tint, although the tint may be amply strong enough. Brightness is expressed in terms of the percentage of the total light reflected. A bright white mixed with a clean tint gives not only the most light, but the most pleasing effect. The eye is an excellent judge of brightness, if you have standards of comparison.

(c) Finish

By finish I mean what we commonly speak of as flat eggshell, or gloss. A most important consideration from every viewpoint.

The above terms may be defined scientifically but for the present it is amply escriptive to use the terms mentioned. There is no disputing the fact that a diffusely reflecting surface is the most pleasing and restful to the eye. While the full gloss paint or mirror like reflecting surface stands at the other end as the least pleasing and restful, the discussion under Useful Effects and Maintenance of all desirable effects will greatly affect our judgment of the finish.

(d) Balance or Harmony

The rules of balance and in colors, insofar as they apply to the ordinary building, are not difficult to master. Decreasing brightness from ceiling to floor, from top to bottom, as in nature. Strong glossy colors where the effect of strength is desired: on iron stairways, elevators, structural members, etc., but seldom going on the red side of the color range: few uses of black and prefer-

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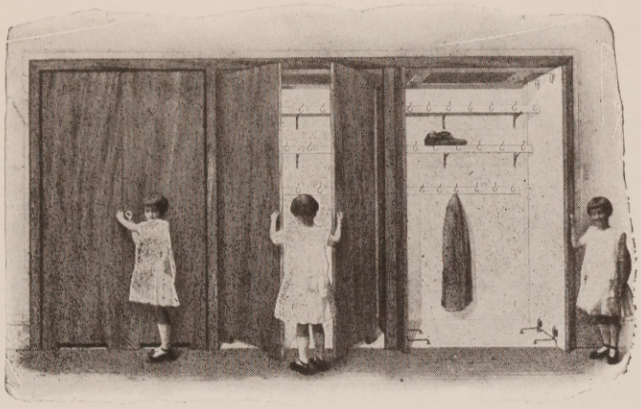

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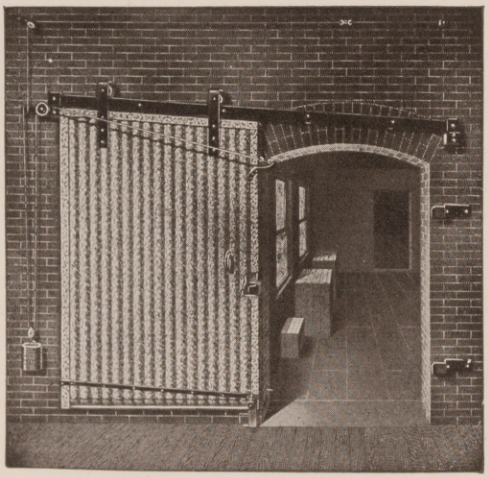

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able sticking to the greens for such work. These are about all the rules the building manager has need for.

II—Useful Effect.

(a) Percentage of Light Reflected

Under the heading of Useful Effects, first consideration should be given to total percentage of light reflected. The amount of light absorbed and not reflected or diffused into the room by different grades of so-called white paints is higher than most of your estimates. For example, the best grade of lithopone, flat or gloss white paint will reflect and diffuse as much as 85% of the incident light, while the best grade of similiar white lead paint will not do better than 75%. When a flat wall paint collects dirt and is not washed down clean, or when we begin to tint the fall off in reflecting power is quite marked. A light cream for example dropping the reflecting power to 70%. Light buff to 65%—light green to 47%—red to 12% and warm green to 22%.

Wherever the volume of space is relatively large, compared to the surfaces, i. e., large rooms and walls, factories, etc., so that slight gloss reflection is not perceptible, the paint should be the best white to give high initial reflection and a slight gloss finish, so as to maintain the high reflection and not lose it through dust accumulation.

In all places, even though small, where high light reflection is essential, that is to say where the natural lighting is poor and there is liable to be dust, Gloss White Finish is justified. As light conditions improve and dust is lessened, the gloss may shade back to dead flat.

(b) Minimum Accumulation of Dust and Dirt

There is only one answer: High Finish Enamel for the more conspicuous places and High Grade Mill Gloss for the less conspicuous.

(c) Protection of surface from marring and scarring

Flat Wall Finishes and rubbed enamels do not protect quite so well as the higher oil glossy paints, but they show the effects less. Hence, the answer in high grade building, where maintenance of the pleasing effect is essential, is in favor of the paint that shows the least and not that which really protects the most by its more cushioning effect.

(d) Sanitary Effect

In favor of White Gloss and Enamel, more on a psychological basis than real, however, as any paint in good condition is essentially now septic and unhospitable to insect life.

III—Maintenance of Both Pleasing and Useful Effects.

This element has been discussed somewhat under the individual headings. There is no question that from the maintenance standpoint, the argument is all in favor of the gloss paint. Dust does not collect on it as easily; finger stains do not take so readily; changing moisture conditions in the surface behind the paint do not so readily affect the perfection of the paint surface, in fact, every factor that deteriorates may be stayed or removed more easily from the high oil smooth gloss surface, than fro mthe rough low oil flat.

In the above discussion, I have tried to point out the elements desired in a paint job.

In designating what combination you want, your judgment, after consultation with the Architect, Paint Salesman and Painter, must be used, as in every other choice, and no man can have all the elements. Pointing out the elements that make up the whole effect is the essential step to making a balanced judgment. The criterion of good judgment is, how close does the combination you have selected come to meeting the specific needs of your building.

B—What Paint Will Produce the Desired Job.

I—What Pigment Is Required

II—What Vehicle Is Required

A paint consists of pigment and vehicle or binder. A discussion of which is the more important is fruitless, since you can't have paint unless you have both. Both function in the performance of every Pleasing or Maintenance Effect.

In general the pigment gives the brightness and tint and the vehicle or binder, the finish and the maintenance elements. There are important exceptions to this generality, however, in that neither white lead nor zinc oxide can be made to give a dead flat paint, while no other material than zinc oxide will give a high grade enamel no matter what vehicle is used.

We will first discuss how the results desired in the finished job determine the pigment portion of the paint.

I—The Pigment Required.

From the standpoint of pure color or tint and brightness that pigment should be used as a base, whose total hiding and reflecting power is the highest and which is the freest from tint.

Accetped practical and scientific data put two commercial pigments distinctly superior to all others in these respects. There are French Process Zinc Oxide and High Grade, Light Resistant Lithopone.

A pound of High Grade, Light Resistant Lithopone will hide 17.5 sq. ft. of surface.

A pound of French Process Zinc Oxide has a hiding power of 14.2 sq. ft.

A pound of White Lead 12.4.

A pound of Whiting less than 6 sq. ft.

French Process Zinc Oxide in Flat Wall vehicles painted on black panels has a total reflect-

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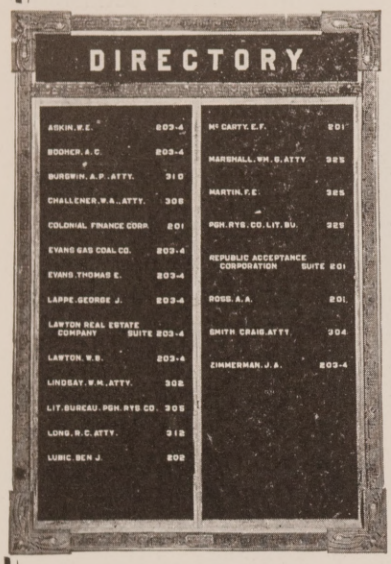

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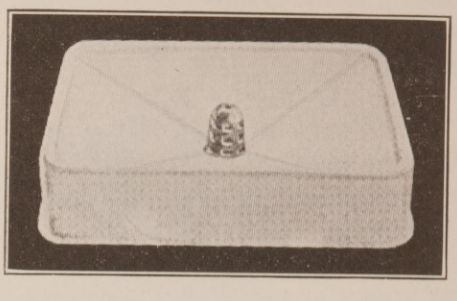

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Made in porcelain enameled pressed steel, and galvanized. All parts of pan slope to center.

Can be set without tools when roughing is in. The strainer, tapped wide, compresses gasket against pipe and shoulder of pan.

This PAN was formerly sold through a selling agency but is now being handled by Plumbing Supply Houses or direct from us.

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Shales	Fullers Earth

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Analyses
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ing coefficient of 78. High Grade Light Resistant Lithopone—81. White Lead—67. Whiting—38.

The superiority in freedom from color or tint, between these two leaders and their nearest competitor is quite apparent to any observer.

For tints only, pure tint high grade colors in oil may be mixed with the white bases by the manufacturer or the painter on the job.

Finish determines the pigment to some extent.

No other commercial pigment produces a dead flat, completely diffusing and restful surface like lithopone. Lead highly thinned may be gotten down to only a slight gloss, while zinc is impossible to get nearly flat.

On the other hand, French Process Zinc Oxide is the only material from which high grade enamels can be made.

For intermediate finishes of the highest grade, varying proportions of the two extremes, lithopone and French Process Zinc will give any finish desired with the maximum of brilliance.

Useful Effects.

The only factor under this heading that influences the choice of pigment is percentage of light reflected, which subject has already been discussed under brightness.

Maintenance of the Desired Effects.

Much has been made of the part that pigment plays in the life of exterior paints, but there is not one bit of unbiased practical or scientific information available which shows that any of the common pigments have any relatively beneficial or harmful effect on the life of a paint exposed indoors when the vehicle is properly designed for that pigment.

The life of an indoor paint is determined by the vehicle, not the pigment.

There is one highly important factor affecting the pigment under maintenance and that is, it shall not show darkening from ordinary gases, such as are present in toilet rooms or in the vicinity of kitchens or gas burners. Lead paints in light tints will darken under such conditions, but lithopone and Zinc Oxide paints are unaffected by gases.

We will now discuss how the desired results determine the vehicle portion of the paint.

II—The Vehicle

There is no more important feature in the design of a paint than the choice of the base vehicle and its subsequent refinement and compounling into a finished drying and binding medium.

Here is where the knowledge and skill of the paint manufacturer are measured and where the judgment and ability, to specify clearly, of the Architect and Building Manager are likewise put to the yardstick. Probably the strongest reason why lead in oil has held on so persistently in interior painting when a whiter, brighter, thirty to fifty percent greater strength or hiding power pigment, like lithopone, has been available to the other manufacturers at a considerable lower price for some years, is the fact that the lead grinder has stuck to one vehicle, raw linseed oil. The man who has a good thing in his day and sticks to it, avoids the inevitable mistakes of the early development of new and better products, and does act as a stabilizing influence. When the development stage is past, however, he wakes up to the fact that the world does move, and that he is fighting a losing fight with the progressive younger generation and is intrenched only in the good will and prejudice of the older men, who are indifferent to new practices.

Vehicles other than raw linseed oil for interior paint passed beyond the development stage some years ago. There are still good, bad and indifferent ones but it is not a difficult matter to specify either the best for a given purpose or good ones for general purposes.

I can instance no stronger practical proof of the superiority, from every standpoint, of refined and treated oil over raw or boiled oil as a vehicle for interior paints than the practically universally accepted superiority of the so-called mill whites which are ground in vehicles of this type.

Raw and boiled oil have their places, the latter in undercoaters, but don't let anyone tell you there are no Luther Burbanks in the paint industry and that nature can't be moulded to a purpose.

The design of the vehicle from the standpoint of original color and its maintenance offers one of the most difficult problems in the paint industry.

Raw or boiled linseed oil yellows in interiors to a remarkable degree and if there is any quantity present in the paint film no light tint, much less white, will maintain its purity and pleasing effect. Most of the stuff the old timers pull on you about the wonderful interiors they used to do or know about are concerned with strong hard colors or with whites that turned dingy yellow.

Before the days of good lighting and vacuum cleaners, and that isn't so long ago either, lots of defects in paint were not noticed at all. We have been educated up to better things, that's what the old timer forgets.

A discussion of how to treat oils to prevent yellowing is out of place here suffice it to say that certain oils, Soya Bean Oil in particular, are less subject to this defect than others. These oils as well as linseed can be refined to cut the yellowing down to a minimum by carefully controlled processes.

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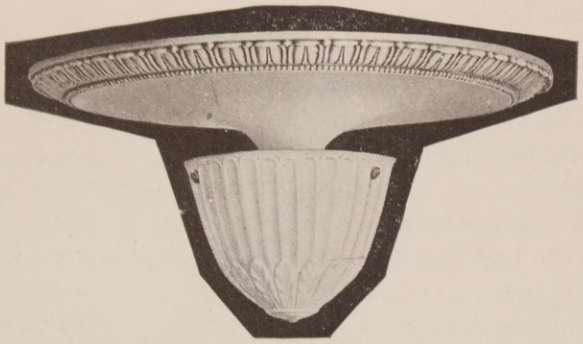

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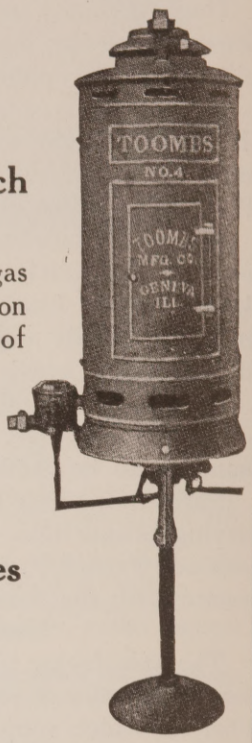

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tive tests. Simply paint tin panels with the paints offered and put them in a warm, not hot, damp dark drawer or box and look at them every so often. You'll find the difference easy enough. To be of the most value to you expose the panels in the exact darkest, dampest, warmest place you expect to use the paints in. This may take a little longer but a good result is worth spending a little time over.

In making your comparisons be sure you compare paints with approximately equal ratios of vehicle to pigment. It is the vehicle that yellows, not the pigment, so that flats always stand up better than glosses or enamels. The small amount of vehicle that it is possible to use with a flat paint, with the consequent minimum degree of yellowing is one of the prime causes of the complete success of this class of paint wherever pleasing effects are paramount.

The design of the vehicle from the standpoint of finish, i. e., flat, eggshell or gloss, has been partially discussed under pigment and partially in the foregoing paragraphs on color as it effects vehicle.

While we are greatly restricted in our finish possibilities, as stated before, by the pigment the vehicle for any one finish is more varied in practice than the pigment by a great deal.

The basis of all high grade Enamels is French Process Zinc Oxide but there are hardly two vehicles alike in which it is ground.

To make the general effect of vehicle on finish clear we will take mixtures of lithopone and zinc oxide, the supreme pigments for interior use, and discuss briefly how the finish may be varied with them from Enamel to Dead Flat. Lithopone and raw linseed oil mixed together with some dryer and ten or fifteen percent volatile matter like turpentine or mineral thinner will give a medium low gloss paint. As we cut the oil and increase the thinner the finish will lose gloss and become finally a dead flat. If instead of raw oil we used a refined or bleached, bodied oil the lithopone starts off with a greater gloss, in fact second grade enamels are made largely of lithopone, but the gloss disappears, as with the raw oil, when we cut the percentage of oil present and increase the thinner.

The greater the oil is bodied the more thinner has to be put in to get the flat finish. (You can see why some paint manufacturers leave the straight and narrow path.)

Now put in the variable of the percentage of zinc oxide. A small amount of zinc added to the lithopone oil mix, say 25%, immediately raises the gloss even in raw oil. In the refined bodied oil it gives the lithopone immediately an enamelly finish, not so high or perfect as straight zinc would, but ample for all ordinary, large surface uses where the tile finish is necessary to easy maintenance.

If you cut such a paint thinner you get the eggshell finishes and velvet finishes that have such a wide demand.

The discussion of the influence of the desired pleasing effects on the vehicle, plus previous discussions under useful effects, have pretty well covered the ground that logically belongs under the heading of how the desired useful and maintenance effects determine the vehicle.

C—How and Under What Conditions the Paint Shall Be Applied.

The cause of probably eighty-five percent of paint failures lies in either the lack of supposedly secret or professional methods of ducking these principles.

Let us discuss adherence for a moment. Unfortunately paint men have only just begun to study scientifically the phenomena of surfaces. They have by cut and try rung in a great number of changes on the pigment and vehicle, but I can't find a single record in the literature of an honest to goodness attempt to subject the phenomena of adherence to a careful laboratory scrutiny.

In most of the discussions purely friction or suction adherence is dwelt upon, whereas as a matter of fact the amount of actual chemical contact with and cohesion to the wood or plaster surface pretty well measures the amount of real adherence, which can withstand separating stresses of any consequence.

Why won't any paint stick to any surface, if you can manage to brush a film of it on? Because in practically every case of failure to stick the paint never touched the real surface of the wood or plaster, but simply lay as a friction and suction held coat over the top of a film of condensed water. Because you can't see water or wet your hand on the surface, doesn't mean there's no water there. To get the surface film of water off of glass, for example, you have to heat it up to some 600° or more Fahrenheit and suck it off with a high vacuum.

You can't give wood or plaster any such treatment as that! Yes, but you can go as far as possible in that direction and the further, the better the adherence. No one has put on a good coat of paint over a film of water yet. You can do it in the laboratory with some degree of success by keeping the bare unpainted back of a wood or plaster panel warm, and the paint side cold, getting rid of your water out the back door, so to speak.

You have undoubtedly been puzzled by the fact that the same paint on two different jobs under apparently the same conditions, not the best as far as moisture is concerned, has given

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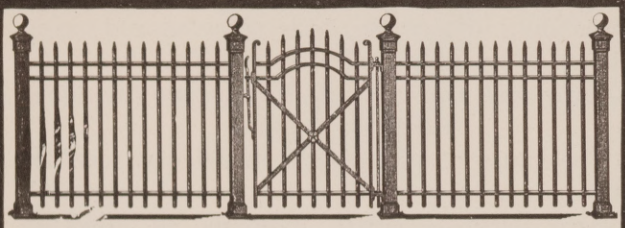

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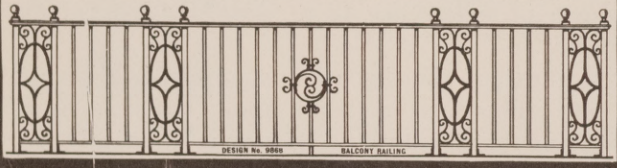

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good results in one case and complete failure in the other. There are several reasons for this, but the commonest are differences in the porosity of the wood or plaster and differences in the rate at which the temperature and humidity are changed on the paint side after painting.

If the wood or plaster contains water, which it always does, and you raise the temperature of the building that water generates steam or vapor, the pressure of which is dependent upon the amount of water present and the particular capacity of the wood or plaster.

That pressure has to be relieved somewhere. Now the interesting thing is that paint and varnish films, while they are truly impervious to water in the sense of possessing no channels or pores, do take up water from their wet side and breathe it out or evaporate it on the dry side. You can raise the temperature slow enough on the paint side, even though you are sealed upon the back side, so as to relieve the pressure of vapor within, fast enough not to tear off the film. It is much better and far more practical, however, to keep the back side of the plaster porous and well ventilated and raise the temperature slowly, so that the water can all escape that way.

Normal plaster, in its green state, is full of water soluble lime, which comes to the surface of the plaster and the back of the paint along with the water and attacks the oil, especially if it is untreated linseed oil, combines with the oil making a fluid soapy solution, which runs down the wall in ugly dark drops, carrying the tinting pigment with it and leaving some of the base pigment behind decolorized.

When such a job approaches dryness and the film begins to shrink, it simply pulls off in flakes because there has never been any adherence. If the original paint contained a harder, less easily attacked varnish, instead of the raw oil, the damage would not be visible immediately by running down, but would exist all the same right from the start and as soon as the shrinkage stresses get strong enough it will peel off perhaps a year later exactly as the runny paint does somewhat earlier.

I don't need to tell you, gentlemen, that you can't seal water in wood or plaster with paint. As you raise the temperature, that water has got to get out and the free soluble lime comes along with it. If you can make most of it go out back of the plaster, good enough, but it's too late if you discover that it didn't.

China wood varnish will hold back the water and lime more than some other films will, and certainly run less when wet from behind by this combination. But if the water is the least bit in excess, as soon as the shrinking does start, the job will peel worse than if nothing had been put on.

The answer to the question, "When does plaster cease to be green," is a long one.

Wait as long as you can before painting, if you have to paint in less than two or three months, wash the walls with a solution of zinc sulphate, a few days before putting on the first or priming coat, then let the wall thoroughly dry. The zinc sulphate forms an insoluble sort of lime lithopone compound, which does not attack the oil. I would specify for safety sake a zinc sulphate wash on every plaster job that is painted for the first time.

It costs little and is mighty good insurance, if water comes through the plaster by accident any time.

If water is the worst enemy of adherence its unequal distribution in a wall (for there's always some there, just as there is in the paint film) is the cause of the worst difficulty with the production and maintenance of a uniformly flat finish.

After a priming coat has been put on any surface, the following coats should not be applied until the porous spots, i. e., the dryest spots, have been filled with vehicle. Where water has gone out, oil will go in, and if the priming coat hasn't satisfied the surface the second and third coats will suffer and your finish will be non-uniform. Don't start the second coats until the primer shows a uniform gloss all over the surface.

A complete discussion of this subject of proper condition of surfaces to receive paint would fill a book.

You may compromise with water and lime, but you have no one but yourself to blame if the job fails, even though some other fellow got away with it under conditions apparently identical.

You're not sure whether he really got away with the job or not, until perhaps several years after when repainting becomes necessary long before normally due, and the little saving in first cost is completely wiped out.

Now as to thinning paints or pastes, as supplied, especially, for priming coats. Boiled oil and china wood varnish are both excellent thinning mediums for priming coats to supply the extra oil necessary, in order to saturate properly dry plaster or old dried underpaint. Be careful of your thinning spirits or turpentine in this undercoat. Wood or plaster full of oil is the best base in the world and thinner, in quantity, is only necessary when conditions are poor (too cold or wet) for penetration, and then you shouldn't paint anyway.

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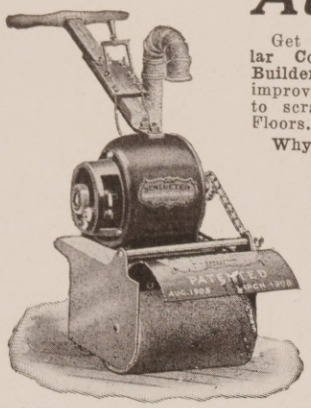

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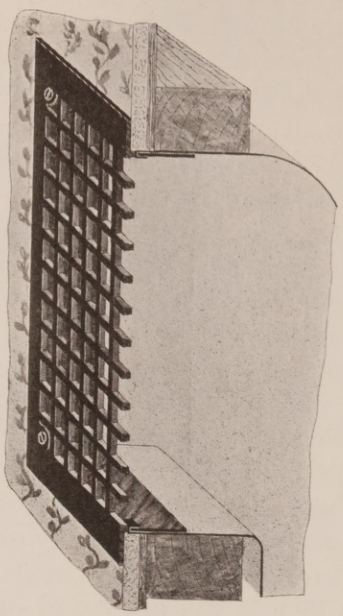

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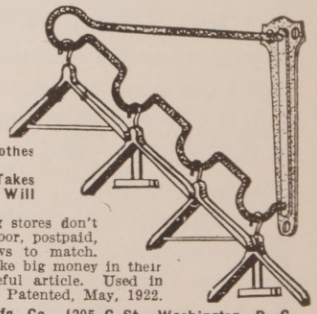

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Wash the paint with alkali free soap in warm water, and rinse thoroughly. That's about all the maintenance necessary.

There is one thing, however, that you must constantly be on the watch for, and that is again our old friend water.

It works in under the window sills, and pulls the paint off the sill while the side of the frames is perfectly good. A slight leak in the roof may get down through a number of walls. A sweating pipe, a leaky connection all cause trouble with paint sooner or later. Many a job has to be painted all over, because of the neglect of a leak that only affects a small area.

Paint may have been ever so adherent originally, but if water has to evaporate through it rapidly, adherence is soon weakened and when the film becomes dry again, it curls off. Films always curl outward because the outer coats of paint being more oxidized try to shrink more than the inner coats, and when released from the wall, the softer less oxidized under coat stretches on the outside of the curl, and the tighter harder outer coats from the inside.

*Chief of Research Division, The New Jersey Zinc Company.

Engineering Progress At Washington and Lee University

Among recent achievements at this university may be mentioned the development and enlargement of General Lee's School of Engineering.

Extensive laboratory equipment has been purchased and installed during the past year for the testing of steel and concrete and all of the materials used in Highway Engineering. Other complete equipments were already available in Surveying, Cement Testing and Mechanical Drawing. Students taking the general course in Engineering also avail themselves of the laboratories of the scientific department and of the new laboratory of the department of Electrical Engineering.

Careful attention is being given to the matter of engineering theses. Each graduating student selects his own subject from one of the three main branches, namely, laboratory investigation, design and field research. All of the laboratories are available for thesis work. Laboratory investigations this year are being made on the relative value of the standard tests for Trinidad asphalt. In the subject of design a plan is being prepared of a storm-water sewer system for Bluefield, W. Va. Another interesting study consists in the preparation of a city plan for Memphis, Tennessee, which by reason of its peculiar educational value will be briefly described below. It is hoped next year to prepare a plan for a water power project at Goshen Pass, Va.

In the recent revision of the curriculum, emphasis is still placed on the **fundamentals.** Rigorous theoretical treatments are supplemented by ample laboratory and field illustrations. Relief in an overloaded curriculum has been provided by the removal of subjects of a non-essential character. While a general pruning has been thought desirable, and is in accordance with the results of recent determination concerning engineering education by several national professional societies owing to overcrowding by an ever increasing number of specialties, recognition is made of the fact that a specialty may claim recognition and position an on undergraduate course by reason of its **inspirational** and **educational** value rather than for the amount of desirable information which it may impart.

We are recognizing also that modern engineering has transcended old ideas based on materials, forces and technique, for engineers are dealing now with other forces also. Our young men must understand that there are sociological and economic problems connected with an engineering project, fully as important as the calculation of stresses and the proportioning of materials. In addition to this, modern engineering more and more is recognizing ideas of comprehensiveness and mutual dependence, dealing as it does with new and involved problems, often of great magnitude, which cannot be solved without a study of a large number of factors—factors within the problem proper, and factors outside of it which often bear heavily upon it.

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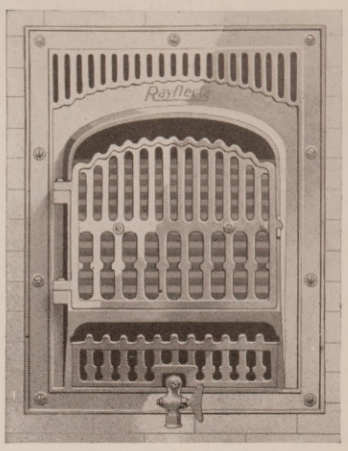

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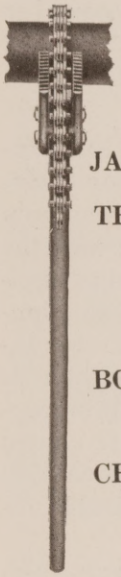

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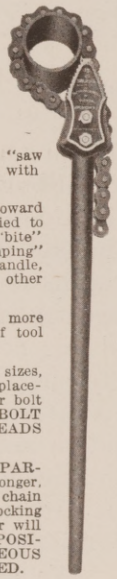

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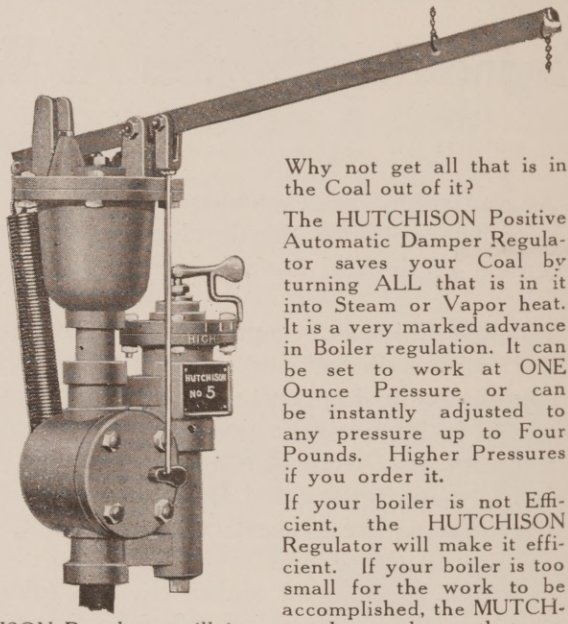

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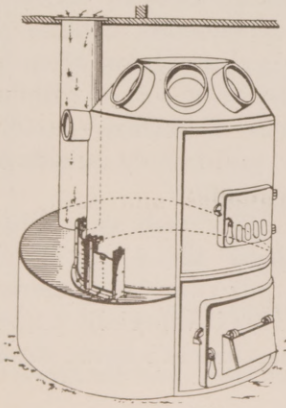

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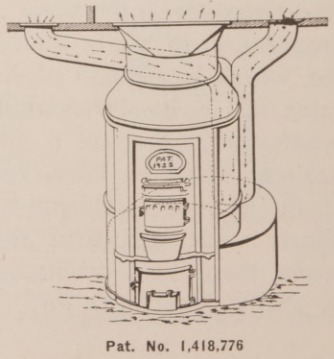


Pat. No. 1,418,776

Two of our seniors, Messrs. Rudolph Jones and W. T. Kilmon are now at work on a city plan for Memphis. This has grown as most cities have grown without regulation, and has now reached a condition of congestion and confusion requiring relief. Plans are being made for a system of radical streets from a civic center in the business district. The boulevard which now extends around three sides of the city is being designed to completely surround it. A parkway is also being planned outside the city and encircling it, utilizing Nonconnah Creek and Wolf River as the architectural basis of development. These waterways provide the necessary architectural features, woodland and water, and of course can be purchased at a low price since they are of little value otherwise.

It is planned to bring together the railroads from the east at the city line and depress them through the city except where they must come to the surface to enter the present railroad stations. North and south lines will be carried on an elevated structure. Abandoned railroad rights-of-way are to be developed as streets, and in several cases into diagonal streets of the greatest possible value. Zoning plans with regard to use, area and height of buildings are also under way. Some attention has also been given to the subject of parks, although Memphis is already exceptionally well equipped in this respect.

William T. Lyle.

New Secretary for Associated General Contractors.

Col. D. H. Sawyer, who has been appointed secretary of the Associated General Contractors of America, Inc., 1038 Munsey Building, Washington, D. C., to fill the vacancy caused by the recent resignation of Mr. Eugene Young to enter business at Minneapolis, is a native of Mt. Pulaski, Ill., and a graduate in engineering of the University of Illinois. After graduation he was engaged in engineering and building operations for about a year and thenceforward was successively City Engineer of Paris, Ill., chief engineer of the Illinois Traction Co., member of the firm of Sawyer Brothers with offices at Seattle and Spokane, and construction quartermaster in the army during the war, when he had charge of the building of Camp Grant. After his return to civil life he was connected with the James Stewart Co. on various building enterprises. Col. Sawyer therefore brings to his new position the valuable results of years of experience which has particularly fitted him for the office.

$4,000,000 FLORIDA HEALTH RESORT PROPOSED.

C. W. Winkler of Miami Beach Promoting Enterprise—Six-Story Structure to Care for 1000 Guests.

C. W. Winkler of Miami Beach, Fla., is promoting the establishment of a health resort to be known as the Riviera, at a point midway between Palm Beach and Miami Beach, and to cost in the aggregate nearly $4,000,000. It is planned to erect a six-story structure, which will be in the nature of a hotel-hospital-sanitarium and will have accommodations for 1000 guests.

The cost of the buildings and equipment is estimated as follows:

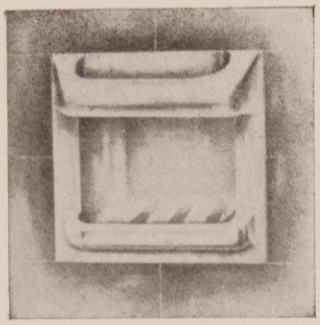
Main building, $2,550,000; mechanical and electrical plant, $100,000; furniture and equipment of rooms, $700,000; hospital equipment, $300,000; furnishings of lobby, palm room and lounge, $200,000; garden, terraces and landscaping, $40,000, and organ $25,000.

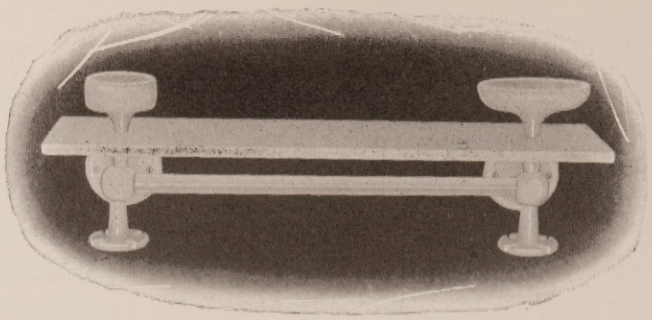
A site has been secured and plans for the building are being prepared by J. E. O. Pridmore, of Chicago. The main structure will have four massive wings, the distance from wing to wing being 558 feet. It will be of the Spanish type "with an infusion of Gothic ideals" and will contain 942 rooms and 1182 beds. In front of the building and on the ocean front there will be a boardwalk 60 feet wide and 1000 feet long.

The structure will be fireproof with a reinforced concrete frame, floors and roof, hollow tile walls and floor finish terrazzo, mastic and rubber. Vitreous tile floors will be used for toilets, baths, operating rooms, X-ray departments and kitchens. Stucco will be used for exterior finish with cast stone trimmings. The ground floor, second, third and fourth floors will be devoted to living accommodations for patients, while the fifth floor will be arranged for the segregation of the various medical departments. There will be gymnasiums for men and women and a lounge of sufficient size to seat 600. For out-door amusement, it is planned to construct a golf course and other facilities.

Russell Seymour, architect, announces the opening of an office for the general practice of architecture at 220 Boyd Building, Charleston, W. Va. Manufacturers' catalogs and samples are requested.

Theo. Steinmeyer, architect has moved his office from the Title Guaranty Building, St. Louis, Mo., to the International Life Building, that city.





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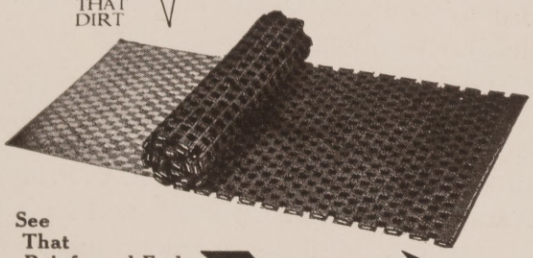

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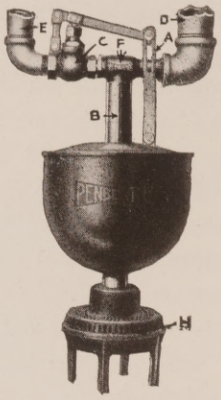

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