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PATIO, PALACIO DE LOS DUEÑAS, SEVILLE, SPAIN
ANCIENT and MODERN ARCHITECTURE in SANTA FE, N. M.

SANTA FE is proud of its age. Before the discovery of America it was the Indian capital of the Southwest. Later, the Spaniards made it the capital of New Spain and from it ruled their wide dominion in North America. It became the seat of government of the new territory when the United States took possession and it was only to be expected that this, the second oldest city in the United States, would be chosen as the capital of New Mexico when that territory became a state. With such a historical background it is not surprising that Santa Fe clings to its traditions and that present day residences have copied the beautiful old Spanish architecture which in turn was inspired by the cliff dwellings of the Indians. But now concrete tile and Portland cement stucco are taking the place of the adobe bricks and mud plastered walls of which the pueblos were built.

The typical Indian pueblo is a many-celled building of several stories, opening on one or more courts or plazas. In its arrangement its value as a defensive structure, besides being a place of habitation, was originally given weighty consideration. When the pueblo enclosed a single court, the outer wall was usually the highest, and was pierced with only small openings or portholes, to afford a view of the surrounding country. A slight elevation was usually preferred, but there are many instances where the site is a lofty mesa or a level plain, while still others were built in natural recesses in the rocky walls of canyons or cliffs, hence their popular designation "cliff dwellings."

Both rounded and polygonal structures were common, while some pueblos are semi-circular in ground plan, with a high rear wall and with the houses arranged in terraces, the tiers of dwellings successively retreating so that the roof of the lower formed the means of access as well as the "front yard" of the tier next above, and so on to the sixth or seventh story.

The ground tier usually contained only small openings, access being gained by a movable ladder to the roof, which was provided with a hatchway. Most of the pueblos still follow this ancient form, but there are now but few houses whose ground floor is not provided with doors and windows. The structural materials depended largely on the immediate supply. Slabs of sandstone, being abundant, were commonly used, neatly pecked and laid up in adobe mortar or chinked with...
spalls and although the joints in the walls were not "broken," the result was frequently a marvelously straight and strong wall that has stood the ravages of centuries. Molded adobe bricks, now so commonly used, were not made in pre-Spanish times, but balls of mud, mixed with ashes and sage, and dried, were in vogue as a building material in prehistoric times.

The advent of the Spaniards introduced the use of brick-formed units in the so-called "adobe" construction. (Adobe—from the Spanish "adobar," meaning to daub or plaster.) These sun-dried bricks are made from native clays, being molded in roughly rectangular shapes, usually in two principal sizes, 18" x 9" x 4" and 16" x 12" x 4". The larger are used as headers, the smaller as stretchers. The sides of the freshly molded units are turned alternately to the sun day by day for a week or two, stacking them up for use when sufficiently "baked."

The hardened blocks are then laid up in adobe mortar and the entire exterior surface "stuccoed" with adobe mud, applied and smoothed by hand. The resulting surface finish is rough and streaked with hand prints.

The roof supports of the houses consist chiefly of pine or cottonwood beams, with ends protruding through the exterior walls. Light poles are then laid transversely across the beams, these in turn being covered with brush grass and adobe mud, well tamped.

Windows, at first unknown, gradually found a place in these adobe structures as living conditions became more peaceful. Flakes of selenite were pieced together for window panes, but these have given way to stock frames purchased from the white traders.

The corner fireplace and chimney have gradually taken the place of the former central fire-pit with the hatchway furnishing egress for the smoke.

Weathering has its effect on these adobe structures. Adobe soils are very plastic when wet and the finished walls soon show the effects of rain. The surface becomes marked with numerous irregular crevices formed as the dissolving "adobe" streaks its way to the ground. Each year the
A MODERN HOUSE, BUILT OF ADOBE.

These houses are built like the old pueblos and Spanish houses, with corbels, arcades and slightly curved walls, and are designed with soft weathered corners and concrete beams resembling the wooden beams of the past.

INDIAN PUEBLOS, TAOS, N. M., BUILT OF ADOBE.
Weathering has its effect on the adobe structures. The adobe soils are very plastic when wet and the finished walls soon show the effects of rain. The surface becomes marked with numerous irregular crevices formed as the dissolving adobe streaks its way to the ground.

CASSELL BUILDING, SANTA FE, N. M.

The larger structures are patterned after the Spanish missions. Buildings are ornamented with belfries, the rounded corners of which imitate the rain washed belfries of long ago.
rains round off the corners of the walls, washing off some of the mud plaster and carrying it to the ground where it is deposited against the foundation portion of the wall. The mud plaster is renewed annually and, as the years pass, the lower two or three feet of wall become noticeably thicker while the tops of the walls become thinner, more rounded and sometimes uneven in height. The result is a wall which has a noticeable reverse curve—“in” at the top and “out” at the bottom. It is this curved and uneven wall which the present day builders are copying, using tinted cement stucco to imitate the mud plaster. The stucco of today is patted with a special trowel which closely imitates the finger marks on the old adobe walls.

The larger structures are patterned after the Spanish missions. Garages, hospitals, churches, hotels and government buildings are ornamented with belfries, the rounded corners of which imitate the rain-washed belfries of long ago. The wooden roof beams or “corbels” which projected through the mud walls or formed an arcade in the old buildings have been faithfully copied in the structures of today.

The State Museum is an especially fine example of Spanish architecture. The exterior is a copy of the old missions with a mission entrance at each of the corners. Hand carved wooden doors with hand made hinges open into rooms with stone flagged floors and wooden-beamed ceilings. The “corbel” logs do not form the floor above, however, for a concrete slab covers them.

The tuberculosis hospital is another fine example of mission architecture. To preserve the clean appearance wanted for hospitals, the exterior walls were covered with a white rather than a mud colored stucco. Here also, the floors are of stone flags, the doors are hand carved and the hinges hand forged. Square-hewn beams with carved recesses support the floor of the second story while the too modern electric lights are concealed in niches like those which held holy figures in the missions.

Bungalows, and smaller buildings, also, are built like the old pueblos and Spanish houses, with “corbels,” arcades and slightly curved walls. Even the concrete bridges are designed with soft weathered corners and concrete beams which resemble the wooden beams of the past, much of the work being done by hand. This feature and the adherence to the old styles of architecture are making Santa Fe one of the most delightfully picturesque cities of our Southwest.
SULLIVAN is gone. In the final years of the first half of the world's greatest century of architectural development, a peer among American architects passes on. Four decades ago witnessed the unfolding of his genius, when new constructional methods and new types of buildings were imposed by the uses required by modern social and economic conditions. To him, the world in all its aspects was a field for investigation, reflection and conclusion. Of his philosophy, it is recorded—

"... that in truth it was not simply a matter of form expressing function, but the vital idea was this: that the function created or organized its form."

A corollary of the above, he expressed as follows:

"The problem of the tall building had not been solved, because the solution had not been sought within the problem itself—within its inherent nature. And it may here be remarked after years of observation, that the truth most difficult to grasp, especially by the intellectuals, is this truth: That every problem of whatsoever name or nature, contains and suggests its own solution; and, the solution reached, it is invariably found to be simple in nature, basic and clearly allied to common sense."

This is true of every type of building and in applying this truth to his architectural expression, he necessarily departed from the orthodox architecture of his time because of his inability honestly to apply, as predetermined by the function of a modern building, the standardized, identified and cataloged styles, then and now in vogue. Hence our architecture has been enriched by an individual expression by one possessing a fineness of spirit, who would refrain from doing rather than to do badly; who strove for quality rather than quantity; who would rather achieve according to his lights than to seek popular recognition; who hated the cheap, commonplace, vulgar, mean or most easy manner of expression.

His buildings are notable in many respects and while his unusual scheme of ornamentation attracts immediate attention, it is but a component of a logical design. This ornamentation is of low relief, usually confined to one plane, intricate in its detail and extremely beautiful and, withal virile. It is an elaboration of geometrical form and so fashioned that the basic pattern is not readily discernible, resulting in a feeling of texture rather than form which permits of its incorporation well within the structure as opposed to the standard, inane methods of applying ornamentation upon a building.

In association with the late Dankmar Adler, a great constructionist and executive, Mr. Sullivan designed many buildings of note, among them being the Chicago Auditorium, which is, perhaps, unequaled as an American opera house, and the fine Transportation Building, with its glorious Golden Door, at the World's Columbian Exposition in 1893.

Mr. Sullivan's works and words are prophetic of the future of architecture of which it can be said that—

"Days dead are dark; the days to be, a flame Of wonder and of promise, and great cries Of travelling people reach me—I must rise."

He has inspired others who have kept alive the spirit of truth. Today we see signs of its recurrence.

Louis Henry Sullivan was born in Boston, September 3, 1856, and died in Chicago, April 14, 1924. He was educated in the public schools and received his technical training at the Massachusetts Institute of Technology and Ecole des Beaux-Arts, Paris. He came to Chicago in 1880 and engaged in the practice of architecture with Dankmar Adler and later alone. He received the Gold Medal, Union Centrale des Arts Decoratifs, Paris, 1894. He was also a writer of distinction and among his last work are "The Autobiography of an Idea" and "A System of Architectural Ornament," the completed proofs of which were shown to him during his last illness.
STADIA—PART III


BY ROI L. MORIN

There are five stadia, each for a distinct purpose, in and around London, the Tennis Stadium at Wimbledon, Cricket at Lords, Polo at Hurlingham, Olympic Games at Great White City, and Football at Wembley Park. The last, which was completed last Summer, though actually of smaller size than several other stadia (its overall dimensions are less than those of the Yale Bowl), bears the distinction of having held—the term "accommodated" would be out of place—a larger crowd than any other structure in modern history, for at the dedication, the Football Cup Ties Final, on April 28, 1923, a mob estimated from 200,000 to 250,000, broke down the gates and swarmed the field, the playing space being kept clear only by a cordon of police reserves.

This structure, of steel and reinforced concrete, is designed to provide sitting accommodations for 25,000 persons under cover, ringside seats for 10,000 and standing room for 91,500, so that it is only capable of holding 126,500 spectators comfortably. The "standing room" feature, a thing unknown in American stadia, is best illustrated in Fig. 2. Pipe rails, securely anchored into masonry, by means of steel struts, are provided at regular intervals, for the spectators to lean against. This section is comparable to our baseball bleachers.

The arena consists of a grass field surrounded by a ¼ mile track, so that although an English football field is only 225′ by 345′ the track fixes the inner perimeter of the stands. The track also consists of a 220 yd. straightaway, which

FIG. 1. ENTRANCE FRONT, WEMBLEY PARK STADIUM, LONDON, ENGLAND

JOHN W. SIMPSON, P.P.R.I.B.A., AND MAXWELL AYRTON, F.R.I.B.A., ARCHITECTS

E. O. WILLIAMS, A.M.INST.C.E., ENGINEER
was determined upon after building operations were begun, making it necessary to tunnel for a distance of 150' beneath the stands.* Though a 220 yd. straightaway excites no comment here, as most American stadia have this feature, it is a novel thing in England, and this one is said to be the only straight cinder track of that length in the country. It was thought necessary to include this straightaway as the international meets of Harvard-Yale vs. Oxford-Cambridge are to be held at Wembley Park.

The special ring seats along the outer perimeter of the track are arranged in five rows along the parallel sides, and as many as possible along the curve. These seats are wood planks supported by blocks of concrete. The "standees" are ranged in two tiers, the lower of which consists of 48 steps, 1'-2" wide, the risers varying from 3½" at the bottom to 4½" at the top (all this on filled ground). These risers are formed by 5" x 2" timbers set on edge, the intervening space cinder filled. Access to these terraces is obtained by 49 openings. See Figs. 2 and 4.

Above these cinder steps is the structure proper, i.e., above filled grade,—a series of 31 terraces of concrete steps, 1'-1" risers, 3'-2" treads. See Fig. 4. A reinforced concrete retaining wall was built around the outside perimeter of the cinder steps. As shown in the cross section, the joists in the superstructure bear on this wall at the lower end, on reinforced concrete columns at the upper end, and three latticed steel columns in between. In building the steps on this steel framing the risers were pre-cast reinforced concrete beams, whereas the treads are plain reinforced concrete slabs poured in place.

The parallel sides of the stadium are roofed over for a length of 650' on each side. In this way area, wood slat seats were provided, much similar to those installed in the Yankee Stadium. (See detail in a subsequent article.) The roof is of corrugated asbestos sheets on steel framework.

The natural contours of the site were taken advantage of as much as possible, though 120,000 cu. yds. of excavation were necessary. See Fig. 3.

The striking feature of the entire work is the dignified and imposing gateway, shown in Figs. 1 and 5, flanked by monumental towers. The masonry effect, though the entire gateway is of reinforced concrete, is one worthy of careful study and emulation. The raked-out stone jointing was achieved by the simple expedient of nailing V-
FIG. 4. TYPICAL CROSS SECTION THROUGH STAND, WEMBLEY PARK STADIUM, LONDON, ENGLAND

(Courtesy of The Engineer, London)

FIG. 3. PLAN SHOWING ORIGINAL CONTOUR LINES, WEMBLEY PARK STADIUM, LONDON, ENGLAND

JOHN W. SIMPSON, P.P.R.I.B.A., AND MAXWELL AYRTON, F.R.I.B.A., ARCHITECTS
E. O. WILLIAMS, A.M.INST.C.E., ENGINEER

(Courtesy of The Engineer, London)
shaped wood strips on the inside of the concrete forms. The flagpoles are of reinforced concrete, apparently an unfortunate choice of material, as it dwarfs the towers to no inconsiderable extent. The end elevation of the tower shown in Fig. 5 is surely a scholarly bit of architectural design, as well as an unusual detail of stadium design, which is, as a rule, so bald.

THE LOS ANGELES COLISEUM

The new Los Angeles Coliseum, which was opened last Summer, is at present the largest and most imposing municipal stadium in America. The reservation "at present" is introduced because Chicago is building a structure which will far surpass anything now completed,* while new stadia are being proposed for Washington and Kansas City, so it is a fortunate community that can wear these laurels long.

The features of this stadium are its vast scale and simplicity of design (it is larger in actual dimensions than either the Yale Bowl or the Ohio State University Stadium, although it seats less than the former), and the great peristyle gateway at the open end. This gate follows the curve of the bowl in plan, its height being governed by the height of the parapet wall. The central arch is a 20' span flanked on either side by seven lesser double arches terminating in pylons against the seat banks.

Large plinth blocks each side of the main entrance and a stone pyramid at the top will receive sculptures at a later date.

In laying out the work the question of economy was paramount, therefore the system of excavation and embankment was used. A balance of cut and fill was determined allowing an excavation 32' below the original ground level and an embankment 32' above, making the top of the bank 25' wide and 64' above the playing field. At one end the embankment is cut off by retaining walls leaving an opening 400' long in which is built the peristyle or main entrance. The field approximates an ellipse with a major axis of 680' and a minor axis of 344'. The ends are laid out to a radius of 153' and the sides 1083'. This layout, together with each seat rise of 3/8" more than the one in front of it, gives a clear view of the entire field from any seat.

The front row rises 9" while the upper row rises 15 3/4". The distance from the footway to the edge of each seat is held the same throughout. On top of the embankment there are ten rows of seats built on a wooden framework. The fence behind the top row of seats is 82'-7" above the playing field. The overall size of the Coliseum is 790'-6" wide x 1088' long.

There are 28 pedestrian tunnels at the natural ground level, one athlete terminal leading direct to the playing field and a vehicle tunnel from the street to the playing field. The field is large enough for any athletic event and contains a quarter mile circular track and a 220 yd. straightaway. Reserve player pits and boxes are provided the full length of each side of the field.

The work being entirely dependent on excavation as to progress it was necessary to install some type of excavator that would be rapid and efficient. Therefore a slack line excavator with a 3 yd. bucket was installed. A tower 120' high was built on iron bark eucalyptus skids, the skids laid on a series of 6" diameter eucalyptus rollers rolling on two tracks, each consisting of four 3" x 12" Oregon pine planks laid on the ground. A machine room was built, on the base of the tower, housing a 300 HP motor driven double drum hoist, a belt driven low speed double drum hoist for traction and a small motor generator set to supply direct current.

An operating cab was built high enough in the tower so that the runner could see the interior of the bowl over the embankment at its highest point. The bucket used weighed 11,000 lbs. and was equipped with a 1 1/4" cast steel digging edge. At the rear of the bucket was a pair of sheaves.

arranged one over the other through which the slack line passed in a reverse bend so that tightening the slack line threw the cutting edge of the bucket down giving the operator complete control over the depth of cut. The operation consisted of dragging the bucket across the portion to be excavated maintaining a sufficient strain on the slack line to cause the bucket to cut. As soon as the bucket was filled or the edge of the cut was reached the slack line was released and the drag continued to the point of dumping. Dumping was effected by tightening the slack line and releasing the drag line. The slack line was then maintained taut until the bucket had run out to the end. In order to avoid moving a dead man for the anchor end of the slack line at frequent intervals, a 1½" steel cable was laid the entire length of the work and secured to a dead man at each end. This anchor cable carried a sliding clamp to which the slack line was fastened, thus the entire operation was cared for only by four dead men. Traction was effected by lines at each side of the tower wound on the double drum hoist mentioned above. This hoist was controlled from the cab by the runner.

A recording watt meter was placed in the power line, the ribbon of which gave a record of the number of trips per day, the shut downs, moves, and from the power used a measure of the hardness of the ground being dug.

The plant was found to be entirely suited to the work, the only radical change being that when gravel was encountered at a depth of 12'-15' it was necessary to put teeth on the bucket. The spoil from the bowl was pulled up in windrows in sufficient quantity to make a layer on top of the embankment 1' thick. After these windrows had been built up the length of the travel of the tower a heavy timber about 14' long was fastened under the bucket and dragged over the top of the rows, breaking them down. Then a team and grader finished leveling. The layer was then thoroughly rolled and watered. To date no noticeable shrinkage has been observed.

**Tunnels**

Thirty reinforced concrete tunnels give access to the inside of the Coliseum. A vehicle tunnel of two compartments each 20' x 25' leads from the street to the playing field. Near the lower end of this tunnel the center wall is omitted at which point is the start of the 220 yd. straightaway running track. The tunnel is designed with vertical slab walls except at the two ends where a cantilever retaining wall 32' high was used. The footings of the vertical slabs are reinforced as horizontal beams to take the bottom thrust of the walls. Struts are placed at 16' intervals across the floor of the tunnel from wall to wall so that the wall footings are supported laterally, inde-
The roof is of beam and slab construction. The maximum wall thickness is 41/4" with 1 3/4" square bars, 5 1/2" on centers.

The athletes' tunnel is 7' x 8' and extends from the main corridor of the dressing rooms to the level of the playing field. The remaining tunnels are at the natural ground level and pass under the embankment giving access to seating near the center. These tunnels are all designed as boxes with struts to take the horizontal thrust at the bottom of the side walls. The walls vary in thickness from 10'-15". The walls are waterproofed on the outside with a coat of hot asphalt. The roofs are covered with a membrane waterproofing which is protected by a 1" layer of cement mortar. The tunnels are paved with sand and asphalt.

At the ends of the embankment where the peristyle is located the fill is held by 32' cantilever retaining walls. The steel was placed in these walls continuous to a point 12' from the top where the large sizes were dropped and 1/2" bars were spliced in. No horizontal joints were used, the entire footing and wall being poured at one operation. In some of the smaller walls keyed horizontal construction joints were used but in no case was the vertical steel spliced at the footing.

Seating

Three systems of supporting the seats are used, viz.: The permanent seats on concrete, the temporary seats on embankment and the temporary seats on framework. Below the natural ground level the face of the cut was smoothed off by dragging a land leveler up the slope with the drag line of a portable excavator. Templates were then cut to the profile of the finished concrete and the excess earth was cut out by hand leaving steps 3'-0" wide. The spoil from this operation was carried off in 12" x 12" iron chutes in which a stream of water was kept running. Forms were then placed and the concrete was poured.

Each step was separated from the ones above and below with a thickness of waterproof building paper. An expansion joint was made in each step every 16' by placing a strip of road joint material 3/8" thick in the forms before pouring. The finished seat platforms are 30" wide and the rise from the footway to the bottom of the seat bracket is 9". The variation in rise is obtained by leaving a continuous notch at the edge of each platform above the fourth and increasing the depth of each notch 3/8" over the one below. The seat brackets consist of iron castings to which is bolted a piece of 1 1/2" standard steel tee to support the back. The brackets are bolted to the concrete by 3/8" machine bolts placed in the forms before pouring. The seats are 2" x 10" vertical grain Oregon pine surfaced one side and two edges and painted one coat before placing and one after. They are bolted to the brackets with 5/8" flat head stove bolts. The backs are of 1" x 6" vertical grain Oregon pine.
It was not considered wise to place any concrete on the embankment as there was a probability of settlement for several years. Therefore everything above the natural ground level was of wood—4" x 6" creosoted redwood sleepers were laid on the embankment in a radial direction of 5' intervals. Between these were laid 2" x 4" sleepers. All sleepers were carefully bedded and the earth between was smoothed off and left one inch below the tops. The entire bank was then covered with redwood sheathing on which was laid two numbered so that coupon tickets can be used. Including the boxes there are 75,038 seats of an average width of 18". The present cost of work is approximately $800,000.

The press stand is built at the top of the seating on the South side. It is served with a fifty pan telephone cable and arranged for individual desk lamps for night use.

The playing field was excavated and carefully leveled and an 8" layer of loam placed on it. The entire area is covered with lines of 4" open joint ply roofing felt. The seat benches and footways were then built. This waterproof covering protects the bank from wash, insures a firm support for the seats and aids greatly in cleaning. The top of the embankment is 28' wide. A frame grand stand is built on this carrying ten rows of seats. All the seats on the wood structure are made with resawed 3" x 10" vertical grain Oregon pine, two seats being cut from each plank and so cut that the front of the seat is thicker than the back. It was thereby possible to nail the seat and the footway to the same bracket and secure a level footway and a sloping seat. The seats are all tile which conduct rain water to a cistern where it is pumped to the street. The field contains a quarter mile track 38' wide and a 220 yd. straightaway 39' wide.

**Dressing Rooms and Toilets**

Four concrete toilet buildings are located at convenient points outside the embankment. Each building contains a room for men and one for women. Two ventilators 3' high extend the entire length of the building and a series of concrete grills are located in the outside walls at the floor level—no sash are used so that ventilation is
assured at all times. The lighting is by means of skylights glazed with corrugated wire glass.

The athletes' building, located on the outside of the embankment, contains 76 private dressing rooms, sixteen being equipped with lavatories, and hot and cold water. There are two large general dressing rooms and complete shower and toilet rooms at each end of the building. It is so arranged that the two halves of the building can be entirely separated when both men and women appear in the same event.

**PUMP HOUSE**

The pump house is located under the lower section of the seats and adjacent to the vehicle tunnel. There are two sand traps in connection with the field drains and a cistern of 65,000 gal. capacity. The pumping plant consists of two 500 g.p.m. vertical centrifugal pumps, one 1,000 g.p.m. and one 2,000 gal. horizontal centrifugal pumps all controlled by automatic compensators and float switches and all directly connected. All pumps discharge into a common manifold and the system is so arranged that either 500 gal. pump will prime both horizontal pumps.

The discharge pipe is an 18" riveted steel pipe which empties into an expanding basin at the street curb, no storm sewer being available.

**LIGHTING**

General illumination of the entire interior of the field is secured by using 31 500-watt flood lights arranged around the rim of the Coliseum. Stage pockets are located at frequent intervals around the edge of the field. Power for a 20,000 candle power searchlight is provided on top of the center tower of the peristyle. All tunnels, stairs, exits and buildings are adequately lighted.

**NEW YORK CHAPTER, A. I. A.**

The last program meeting of the New York Chapter, A. I. A., was held on April 9. The stated address was made by Franklin H. Wentworth, Secretary of the National Fire Protection Association. Mr. Wentworth clearly indicated the relationship to and the responsibility of architects in fire protection. The growth of the Association, its organization and its work were described. No effort was made to discuss methods of rendering buildings fire resisting or other technical matters.

The matter of the War Memorial in Central Park was discussed, but no action taken as the resolution adopted at the previous meeting, opposing the construction of such a structure in Central Park, was thought to be a sufficient expression.

The New York Chapter is to be congratulated on the season's work just closing. The meetings have been of great interest and well attended, the membership has been increased and the high standard of the organization maintained. In conducting the affairs of the Chapter, D. Everett Waid, President, has shown himself to be a forceful executive, always exercising those qualities of fairness and moderation so necessary in that position. This is especially noticeable as several conditions developed that required rare tact and skill on the part of the president. The annual business meeting for the election of officers and the reports of officers and committees, will be held on May 14.

**SMALL HOUSE COMPETITION**

*COUNTRY LIFE* announces that it offers a prize of $500 for the best design for a country house for a family of moderate means. The judges of the competition are Alexander B. Trowbridge, John Russell Pope and the Editor of *Country Life*. There will be three honorable mentions conferred. The competition will close October 1, 1924. Program may be obtained by addressing *Country Life*, Garden City, N. Y.
MARSHALL SCHOOL, SOUTH ORANGE, N. J.

GUILBERT & BETELLE. ARCHITECTS
MARSHALL SCHOOL, SOUTH ORANGE, N. J.

GUILBERT & BETELLE, ARCHITECTS
MILLBURN HIGH SCHOOL, MILLBURN, N. J.
GUILBERT & BETELLE, ARCHITECTS
MILLBURN HIGH SCHOOL, MILLBURN, N. J.

GUILBERT & BETELLE, ARCHITECTS
PUBLIC LIBRARY, KENT, CONN.

HEATHCOTE M. WOOLSEY, ARCHITECT
HOUSE OF
CARL L. NITZE
BALTIMORE, MD.

WALTER M. CIESKE
ARCHITECT
INTERIOR ARCHITECTURE
Evolution of the Modern Church Interior

HURCHES, edifices set apart for Christian worship, had their beginnings in the awakening of Christianity. The Gothic style, although not definitely marked until almost 1200 years after the establishment of the Christian church, was the expression in architecture of the Christian faith, an outgrowth of the traditions of the Romanesque which, under the incentive and rules of the church, became a perfect and well-balanced style. A survey of church architecture must naturally start with the Gothic, which might better have been called the Christian style.

In the early days of the church, people's homes were more like fortresses than places for human habitation. In construction, they were massive and their furnishings were appropriately scarce and subservient to their purpose. While the details of the Gothic were suitable for decoration in this type of house, they, thus, can seldom be used to portray the comfortable and informal atmosphere which the modern house must convey. Nor did these crude houses satisfy all that the Gothic spirit desired. The church, however, proved to be the means of expressing the great religious fervor that swept the world. People, under slight restraint, stinted themselves in the home to give their all to the church that it might stand for all that was beautiful in design, skillful in construction and symbolic in detail.

In no other phase of architecture, probably, is unity in design so conspicuous as in the churches of the Gothic period. Structure was the basis of design as it had not been since the time of the old Greeks. In other words, the whole scheme of design was evolved from the plan of the building. The furniture was a part of it. Different forms of ritual affected the plan in different countries and localities just as different materials of construction affected the design of the structure. This phase of architectural design was recently ably discussed by Major H. C. Corlette, O.B.E., in an address before the Manchester (England) Architectural Society. He said, in part, that "if we turn to consider Gothic conceptions in architecture we shall find that they possess much the same sense of unity in design as the Greek builders expressed so well. In their essential nature both these traditional schools followed like principles. These principles showed that structure was the necessary element by which form could be, and should be developed. And
all changes of essential form were to be derived from structural needs. In fact, the plan, with the use for which a building was made, was the foundation out of which all real building tradition and architectural design arose. Climate allowed, or demanded, certain forms; materials dictated some methods. But these all met together and were combined in one. And it was the functional office, the structural nature, worked out as a building problem in every subordinate part, that provided new ideas, suggested differences in form, and gave architectural importance and interest to it is by this same means, using new methods, that the Gothic builders became such architectural creators."

What logic there is in that for us today! In an earlier article in this department, just such unity was urged. For a long time, architects seem to have felt the need of it in church design and it is therefore more evident there than in other buildings. Apply the principle to any building and find its direct application!
A historical analysis of church architecture should begin with a study of the Gothic style.

The name Gothic was given the style to imply its opposition to anything classic rather than to signify its connection with the Goths or Teutons. With the pointed arch as its chief characteristic, the style is more accurately known as the Pointed style. The embodiment of this motive in many of its details seemed all that was required to stamp the design as Gothic. A peculiarly characteristic means of combining this motive in the design was in the various tracery patterns included in the scheme. These often appeared in wall deco-
tions, ornamental friezes, balustrades and window designs. The lines of the designs of these tracery patterns were the means of distinguishing the interpretations of the Gothic by the architects of the various countries, and they form the chief feature of the Flamboyant of France and of the Perpendicular of England. In the Venetian interpretation of Northern Italy, the only section, by the way, of that country which took up the Gothic tendencies, tracery designs were intricate, been used or seen before. Also in the foliage ornament was this radical tendency seen.

For about two hundred years, or up to the close of the XVth century, the Gothic style dominated all church work, especially of the French school, where it had made its real beginnings. Although the church edifice was its principal means of expression, it showed itself in all manner of public and private buildings. In its development, the Gothic reached its greatest height in France.

The character of the architectural design is suggestive of early English or Perpendicular Gothic: its boldness and simplicity are appealing and dignified. The brown oak woodwork is pleasingly combined with the stone. The furniture, of a much later period of English design, is in pronounced contrast in its detail, yet entirely appropriate with the setting. The pointed arch, the shield and trefoil, all Gothic symbols of religious life, are conspicuous in the design.

with a decided Oriental feeling. Built around such a radical feature in design as the pointed arch and originated so expressly for one type of building, the church, other details of the style must of necessity be along radical lines and proportions. Such were the mouldings, for instance, with their angular fillets and deep hollows and undercuts, departing from anything that had ever where it is even now considered the ideal style of church architecture. In England, the church gradually divorced itself from the Gothic. The transition from the Gothic to the Tudor, although very slight at first, became so pronounced that by the year 1509, the date of the beginning of the reign of the Tudor family, there were few of its original tendencies discernible. The Tudor style
was distinctly peculiar to the English. Its qualities suited well the religious feelings of the people of that day and it replaced the Gothic as the ecclesiastic style. It continued the use of certain symbolic motives which had made the Gothic so unique in its field, and the details of the moldings were very similar to those of the earlier style. But even these had an original turn. Its use of rough plaster walls and dark woodwork, combined often with stone of some description, appeals strongly to the church designer as well as to the

The churches of Italy did not come under this spell of the Gothic at all. The people seemed to prefer the Romanesque style which had served them so satisfactorily for so many years. The plaster or stone walls and applied painted ornament and decoration satisfied all their inclinations. Occasional outbursts of Gothic tendencies were noticeable in some of the Italian work, but they were so surrounded by the Romanesque lines and ornament that they were all but lost. It is because the Gothic was not introduced into Ger-

BAPTIST CHURCH IN PASSAIC, N. J.

JOHN F. JACKSON, ARCHITECT

The Tudor style applied to church architecture. A good example of plank ceiling with roof trusses of bold lines and detail, characteristic of the style. Notice the corbels from which these trusses spring, a detail typical of the Tudor

communicant, for their somber but dignified effects are entirely reverential. The roof treatment of the Tudor, of crude roof trusses supporting a boarded ceiling, was in keeping with the other details and lent added interest. The feeling of freedom in design and boldness in detail, together with its symbolic ornament, make the Tudor style well suited to church design and decoration.

many or Spain until many years after its establishment in France and England that the style, as interpreted by the architects of these two countries, is supposed to be rather an adaptation of the French style than to possess any originality of its own. In Germany, as in Italy, the only effect of the Gothic was discernible in its intermingling with the Romanesque and the few real Gothic buildings there follow closely the designs
PART SECTION OF THE METHODIST EPISCOPAL CHURCH, JAMAICA, L. I., N. Y.

JOSEPH HUDNUT, ARCHITECT—W. E. MANHART, ASSOCIATE.

The details are carefully worked out in accordance with the Colonial style. The circular windows and colonnades are characteristic. The arrangement of balusters concealing the organ pipes, with the broken pediment in the center, is accurate in detail.

As perfected by the French. In Spain, however, the designs had more originality and their work was conspicuous for its use of color and decorative furnishings, details which were wholly lacking in both the French and English work of that day. Ralph Adams Cram, F.A.I.A., in a recent series of interesting articles published in The American Architect gives a very vivid account of Spanish Gothic buildings, and their sources of inspiration.

With the birth of the Renaissance in Italy, failing interest in the Gothic became noticeable. Italy welcomed a return to the ideals of its ancestors, especially in church design, for which the old Roman temples now served as fine inspiration and beautiful models. While the lines and proportions were distinctly reminiscent of the old designs, the Renaissance made much freer use of ornament and it had a real modern accent in its lines, making it conspicuous against the severe
background. Carved and painted ornament invariably concealed many of the lines of the architecture inspired by the old temples. These classic motives soon found their way to the surrounding countries. The French churches were not interested in it, but in England it made itself felt. A group of English architects, headed by Sir Christopher Wren, brought the Renaissance to England, and a striking result of their efforts is St. Paul’s of London, a notable example of the English conception of the classic revival. It possesses all the elements of successful church architecture of that period. Its lines and proportions are dignified and its ornament, in the characteristic manner of Grinling Gibbons, is free and bold. Although the color scheme is even cold, with stone walls and pilasters, it never suggests anything but the purely reverential.

With the gradual spread of churches throughout the world, all subordinate to the cathedral, ecclesiastic architecture took on a simpler appearance. The home had become a real place in which to live and money for church building was not so easily forthcoming as in olden days. This scarcity of funds necessitated a simpler church structure than was demanded by the elaborate Gothic lines, and the Renaissance seemed to fill the purpose. Its lines possessed all the emotional qualities that called forth feelings of a sublime and reverential nature, without those extravagant features of construction and ornamentation so much a part of the Gothic. The Renaissance, therefore, became at once popular for church work, especially of smaller and simpler types of edifice, while the Gothic still held its place as the ideal of ecclesiastic architecture when not limited by cost of construction—a place which it still holds.

Generally speaking, as related to the early cathedral, the typical American church is small, of simple, yet dignified lines, with sufficient color to lend interest and repose. The original church buildings in this country were erected by the early New England settlers and were called by them “meeting houses.” This informal term and what it stands for, has held closely to the American church ever since. These original buildings, as all others in those days, were of Colonial design, and there can be no doubt of the devotional tendencies of a modern church designed along those lines. Tradition makes them sacred. They ring with true Americanism. The proportions are informal, construction dignified and details reverential. The colorings of the Colonial are particularly appropriate for church decoration for its tints are soft and mellow, yet of sufficient variety to give interest and restfulness.

Certain denominations have very decided views on what they consider a churchly design. Some, like the Episcopalians, prefer the rich Gothic; the Christian Scientists seem to choose the majestic classic, while the Baptists stick to the homely Colonial. After all, church architecture seems to be limited to these three styles, or their outgrowths and adaptations. This covers a much wider field than would at first appear. For instance, the Gothic actually embraces the Later Romanesque of Italy, the Flamboyant of France, the Perpendicular of England and the Spanish Gothic, all interpretations of the same inspiration. Similarly, the Renaissance style, in the broad sense of the word, includes the Italian Renaissance, the Francois I and Henri II periods, forming the French Renaissance, and the Tudor and Stuart lines as the Renaissance of England. Even the term Colonial covers the English Georgian, the Spanish Mission and the French and Dutch contemporaries, besides our own interpretation of the word,—a sort of intermingling of them all. So church design actually resolves itself into a matter of taste in choosing from these three styles and the periods which they embrace. Each one has much that makes it religious, while tradition makes them all reverential. Opinions differ, of course, and no doubt it is well that they should, for there is thus a much greater chance for the development of architectural styles. Although there are no rules which can even help in making the decision as to which style is best, there are rules to be applied after the choice has been made. These rules are the principles of design, the relation of form to structure and the element of unity throughout. They are the fundamentals on which all historical styles are grounded.
WALL TREATMENT IN ROME

Situated throughout Rome on practically all of her hills, with their gardens above the street level, are the gardens belonging to the larger palaces. The Villa Doria Pamphili, the Villa Celonna, the Villa Aldobrandini, the Villa of the Quirinal Palaces, and many other palaces in Rome have their garden walls flanking on these raised gardens.

The heights that these gardens are above the street level, and the wide space of wall below them to the street level, give ample opportunity for architectural development.

Such a wall is shown on the accompanying drawings, being located on the Via Di Aurora. However simple in character, it possesses a great deal of charm and shows how a brick wall with the Roman stone can be successfully treated.

The bricks measure 8½ x 1½ and four courses are laid to 9".

WALL TREATMENT IN ROME
MEASURED AND DRAWN BY ROBERT M. BLACKALL, ARCHITECT

NUMBER III, SERIES III
FRENCH AND ITALIAN DETAILS
WALL TREATMENT, VIA DI AURORA, ROME
MEASURED AND DRAWN BY ROBERT M. BLACKALL, ARCHITECT

NUMBER III, SERIES III
FRENCH AND ITALIAN DETAILS
CHURCH OF THE HOLY REDEEMER, DETROIT, MICH.

DONALDSON & MEIER, ARCHITECTS
CHURCH OF THE HOLY REDEEMER, DETROIT, MICH.

DONALDSON & MEIER, ARCHITECTS
CHURCH OF THE HOLY REDEEMER, DETROIT, MICH.

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CHURCH OF THE HOLY REDEEMER, DETROIT, MICH.

DONALDSON & MEIER, ARCHITECTS
CHURCH OF THE HOLY REDEEMER, DETROIT, MICH.
DONALDSON & MEIER, ARCHITECTS
This building has a full basement following the lines of the superstructure, which is used for overflow services and has a seating capacity of approximately 1400, the same as the first floor. Construction in general is of reinforced concrete, steel, brick and stone. A smooth, matte texture variegated face brick in tones of deep orange, cherry red, and dull brown was used for the exterior facing. The stone is blue and buff limestone. All exterior sheet metal work is of copper and roof of Spanish tile in mottled shades.

In the interior, walls are in general sand-finish plaster with stucco for the ornamental features. The aisles, vestibules, sanctuary, chapels, etc., are of ornamental tile. The treatment of the sanctuary floor is especially rich and is interspersed with quantities of cipollino marble. Interior wood finish is white oak stained in a subdued dark greenish gray tone.

The high altar and the communion railing were constructed in Italy of Botticino, Siena, Carrara, and Greek marbles with inlaid glass mosaics. A considerable quantity of very excellent stained glass is already in place.

CHURCH OF THE HOLY REDEEMER, DETROIT, MICH.
DONALDSON & MEIER, ARCHITECTS
OWN HOUSE OF ATLEE B. AYRES, ARCHITECT, SAN ANTONIO, TEX.
OWN HOUSE OF ATLEE B. AYRES, ARCHITECT, SAN ANTONIO, TEX.
BEAUX-ARTS INSTITUTE of DESIGN

ACTING DIRECTOR OF THE INSTITUTE—WHITNEY WARREN

ARCHITECTURE—RAYMOND M. HOOD, DIRECTOR

SCULPTURE—EDWARD FIELD SANFORD, JR., DIRECTOR

INTERIOR DECORATION—FRANCIS H. LENYGON, DIRECTOR

MURAL PAINTING—ERNST C. PEIXOTTO, DIRECTOR

OFFICIAL NOTIFICATION OF AWARDS

JUDGMENT OF MARCH 11, 1924

SECOND PRELIMINARY COMPETITION FOR THE 17TH PARIS PRIZE

OF THE

SOCIETY OF BEAUX-ARTS ARCHITECTS

"A UNITED STATES VETERANS HOSPITAL"

One of the recent problems of our Government has been to provide suitable hospital facilities for the care of veterans suffering with unbalanced minds as a result of the hardships, deprivations and horrors of the war. This problem has been faced by dividing the United States into fourteen districts based on military population, and each district is to be provided with suitable hospital accommodations. The plan disposition of such a hospital is the subject of this program.

On a large stretch of Government property in one of these districts, a reservation, 1800 x 2400 feet, has been set aside for the purpose of building a neuro-psychiatric hospital for five hundred patients. The reservation is situated on a high plateau with a main highway on one of its sides, and a nearby railway line permits a spur into one corner of the reservation for the economies of delivery both in construction, and later in handling supplies incident to the operation of an institution of this magnitude. As the prime objective of the hospital is the care of those mentally diseased and their restoration to normal well being, the method requires the organization of a complete institution composed of a number of buildings covering considerable areas with auxiliary features such as heat and power, supply and storage as well as the housing of the medical officers, nurses and attendants.

Briefly, a new patient reports to the Main Building, which is in the nature of a general hospital and also contains the administrative offices. Here he is kept for a period of observation and afterwards sent to the Disturbed or Continued Treatment Buildings. Wherever possible, the treatment takes the form of Occupational Therapy or the co-ordination of mind necessary to performance of skillful work such as weaving, pottery working, mechanics, gardening, truck farming, etc. Cheerfulness is a factor of great importance, and every effort is made toward the contentment of the patients in their work as well as their recreation. At the end the patient is transferred to the Convalescent Building, and from there finally discharged as cured. The general plan should provide for the economic, mechanical and business aspects of the hospitals in such a manner that sun and air penetrate everywhere, and their surroundings rendered as attractive as possible with landscape treatment.

The main group is to be located some distance from the highway to insure quiet. It is composed of the following units of approximately the ground area given:

1. A Main Building of 15,000 square feet
2. A Disturbed Patient Building of 8,000 square feet
3. A Continued Treatment Building of 8,000 square feet
4. A Re-educational Building of 8,000 square feet
5. A Mess and Kitchen Building of 12,000 square feet
6. A Recreation Building of 7,000 square feet and
7. A Convalescent Building of 4,000 square feet

The auxiliary group shall include:

8. Two buildings for Men and Women Attendants, each of 3,000 square feet
9. One Nurses' quarters of 6,000 square feet
10. A small house for the Medical Officers in charge of the hospital
11. A Store House with adjoining railroad siding, and
12. Six small houses as quarters for Staff Officers
13. Six small houses as quarters for Staff Assistants
14. A Garage and Shops Building
15. A Boiler House
16. The composition completed by a greenhouse, truck gardens, athletic grounds, roads, etc.

The names of the units must be shown on the plan.

JURY OF AWARDS:


NUMBER OF DRAWINGS SUBMITTED: -- 22

AWARDS:

PLACED FIRST AND SECOND MEDAL: E. L. Balitsky, Atelier Wynkoop-Seymour, N. Y. C.

PLACED SECOND AND SECOND MEDAL: P. Goodwin, Atelier Licht, N. Y. C.

PLACED THIRD AND SECOND MEDAL: A. F. Estborn, Atelier Hirus, N. Y. C.

PLACED FOURTH AND SECOND MEDAL: H. K. Bieg, Chicago Atelier, Chicago, III.

PLACED FIFTH AND SECOND MEDAL: S. R. Moore, Columbia University, N. Y. C.


FIRST MENTION—N. J. Schlossman, Chicago Atelier, Chic., Ill.

NOTE:—N. J. Schlossman was "H. C." for Prize as he was an Alternate in this competition.

J. L. Evans, University of Pennsylvania, Phila.

NOTE:—J. L. Evans was "H. C." for Prize as he was an Alternate in this competition.

SECOND PRELIMINARY COMPETITION FOR 17TH PARIS PRIZE, SOCIETY OF BEAUX-ARTS ARCHITECTS

A UNITED STATES VETERANS HOSPITAL

H. K. Rieg

PLACED FOURTH—SECOND MEDAL

CHICAGO ATELIER

A. F. Estabrook

PLACED THIRD—SECOND MEDAL

ATELIER HIRONS

Second Preliminary Competition for 17th Paris Prize, Society of Beaux-Arts Architects.

A United States Veterans Hospital.
PLACED FIFTH—SECOND MEDAL
S. R. Moore
Columbia Univ.

PLACED SIXTH (FIRST ALTERNATE)
L. I. Kahn
First Mention
Univ. of Penn.

PLACED SEVENTH (SECOND ALTERNATE)
George P. Turner
First Mention
"T" Square Club, Phila.

Second Preliminary Competition for 17th Paris Prize, Society of Beaux-Arts Architects
A United States Veterans Hospital
The RENTAL of a NEW OFFICE BUILDING and RENTAL VALUES FOR OFFICE SPACE

BY W. H. BALLARD*

CAPITAL will be attracted to the business of owning and operating office buildings, in competition with other kinds of business, in direct proportion to the safety and return which it will yield. The rental value of office space is its value to the tenant or buyer of the space. It is not the value determined by the average cost to the owner of producing each square foot of net rentable area of each individual office.

Planning a rental campaign for a new building covers a larger field than planning for an old or completed building, since with the old or completed building we are limited by conditions already fixed. In order really to plan a rental campaign for a new building the foundation should be laid before the site is purchased, or if this is not possible, before any plans are prepared.

The owner of the new building which is to be erected, rented and operated is engaging in the business of owning an office building either because of the prospective profit to be secured from engaging in the office building business, or because he desires to erect an office building in order that he may use a portion or all of the building to provide suitable quarters for his business.

The owner should secure the services of an architect and building manager before completing the purchase of a site for the building. More often than not the site of a new building is determined before these services are secured. The rental of space in the building and the plans for the building must then conform to the limitations of the site. If the site has not been secured, the architect and building manager will have an opportunity to furnish the owner with very valuable advice in regard to the adaptability of various sites for improvement with an office building.

In determining upon a site and the tentative plans for the new building, a careful survey should be made in order to determine the present and future demand for space in an office building in the particular location or district. Estimates should be made of the kind and amount of space required by the average tenant, the probable number of tenants, the business of the tenants and the percentage of occupancy by various kinds of business. A careful survey of the occupancy of seventy-two of the better office buildings in the financial district of one of the large cities has yielded a great deal of valuable information.

For the purpose of this survey 300 square feet have been considered as the area of a single office. This information may not be an exact picture of the conditions which exist in other cities, but will serve to illustrate information which is of interest to every architect and building manager. The most surprising fact disclosed was the occupancy of 72% of the space by tenants occupying from one to five rooms. The results of this survey are as follows:

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<th>NO. &amp; TENTANTS</th>
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Another interesting result of this survey is a classification of the number of tenants engaged in various kinds of business, the amount of space occupied and the percentage of tenants and percentage of space occupied to the total area.

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<th>NO. OF TENANTS</th>
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<th>PERCENTAGE</th>
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<tr>
<td>365</td>
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</tr>
<tr>
<td>633</td>
<td>600 sq. ft. each</td>
<td>13.80</td>
</tr>
<tr>
<td>2388</td>
<td>300 sq. ft. each</td>
<td>26.04</td>
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Rental Values of Office Space

A tentative rental schedule should be prepared from the preliminary plans and a decision reached as to the tenants to whom space in the building can be rented. The building manager should convince himself of the actual rental value of the office space to be produced, since this is essential in order to convince the tenants to whom the offices in the completed building are to be leased.

It is still a common practice in a great many buildings to make up a rental schedule of the building on the basis of so many dollars a square foot for the net area in each office, making, perhaps, some variation for corners and inside or dark space. This results in an inequitable schedule, many tenants paying more than they should, and others paying less.

A square foot rental is of value only for comparison between different floors in a building, or between the total rentable areas in different buildings.

A true rental schedule should be based on the value of the space to the tenant and not on the cost to the owner of producing a particular office. I believe that I can, with your assistance, perfect a table for determining accurately a comparative rental value of office space. The first essential in a valuation table is a common factor which will provide a means for comparison. I have used, for this factor, an office with a minimum depth of fifteen feet. As the office increases in depth the space decreases in value. The table which I present for your consideration is based on the front foot value of an office fifteen feet deep; the value of greater depths being expressed in a percentage of the front foot value of the minimum depth of fifteen feet. After determining the front foot value for a given depth, a division of this value by the depth in feet will give the square foot value, if desired for comparison. If this table meets with your approval, we shall all be able to revise our rental schedules for our own and also the tenant’s benefit. If we can all agree to use a common factor, for example, the minimum office depth of fifteen feet, our rental comparisons between various buildings in the future will be of more real value.

A complete schedule of the services to be furnished to the tenants should be determined and the cost estimated, since the cost of furnishing this service constitutes a large portion of the rental value to the tenants. After approximating all of the elements such as cost of building, rental value of the completed building and cost of services to tenants, the owner of the prospective building can determine the probable return upon the money which he is to invest in the office building business. An unsatisfactory return to the owner is always a hard problem to deal with, since the owner’s discontent manifests itself in a continual temptation to cut rentals and curtail services.

Selling Space

A rental agent of skill and experience should be secured. If it is not possible to secure the full time of a competent agent, it may be possible to retain the services of a building manager in an advisory capacity. The number of assistants, location and organization of an office depend upon the size of the project. Application blanks, lease forms and other office material should be provided. A census should be taken of all office tenants in other buildings and the approximate rentals which they pay. This sounds difficult perhaps, but is really quite simple if you can secure the plans of the other buildings, and from the street directory or personal observation obtain the names of all of the tenants, the typical area per office can be estimated and an approximate rental applied for each of the different buildings. It is very helpful indeed, upon receiving an application for space, to be able to take the applicant’s card from the file and know, oftentimes better than the applicant does himself, the amount of space which he occupies and the rental which he pays. There is a real opportunity to furnish the larger users of space with the services of an architect to assist them in planning a practical and an economical use of space. This will often result in a tenant’s leasing less space than the amount he believed was necessary.

You are all familiar with the old saying that “anything bought right is half sold.” A building manager whose rental schedule is based on the value of the space to the tenants has “bought right” and should have little difficulty in leasing all of the space in the building. A new building planned rightly is one which will yield the largest number of square feet of rental area of the
highest rental value, together with the smallest number of square feet of secondary value as may be necessary to produce the kind and variety of space required to fill the actual and not the fancied needs of the tenants to whom the space is to be rented.

Space in a new building should be offered for rental only after a careful study has been made of the prospective tenants who may be interested to locate in the building. A preliminary offering of space should be made in person to these concerns. When leases are closed with a number of such tenants, the character of the building is determined and a real incentive furnished to the

Publicity

Publicity in regard to a new office building is always of interest to the general public whether they plan to occupy space in the building or not. A continuous story of the various events pertaining to the purchase of the land and all of the subsequent happenings should be furnished to the newspapers for use as news items. Some of these items are the announcing of a decision to build, the name of the building when determined, the building manager selected, the architect and engineers selected, plans and illustrations of the building, awarding of the contract for the erec-

<table>
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<tr>
<th>Value of Space</th>
<th>Office Depth</th>
<th>Front Foot Value</th>
<th>Rear Foot Value</th>
<th>Front Foot Value</th>
<th>Rear Foot Value</th>
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Ballard Table—Rental Values of Office Space

Percentage of values from a unit depth of 15 feet to a maximum depth of 50 feet. Illustration of the application of this table to office rentals of $3.00, $4.00, $5.00, and $6.00 a square foot for the first 15 feet in depth, expressed in front foot and square foot values for offices of varying depths.
THE AMERICAN ARCHITECT—THE ARCHITECTURAL REVIEW

JURISDICTIONAL AWARDS

At its recent meeting held in Pittsburgh, the National Board of Jurisdictional Awards rendered a number of important decisions which are summarized as follows:

Case No. 3. Request for Rehearing of Decision on Low Pressure Heat. (Disputants: Steam Fitters and Engineers.)

The Board reaffirmed its decision made August 2, 1923, awarding the work to the steam fitters.

Case No. 26. Rehearing Foremanship over Concrete Work on Walls, Foundations, Footings, etc. Below the First Floor. (Disputants: Bricklayers and Laborers.)

The Board decided that the work in question shall be done by laborers under the supervision of such skilled mechanics as the employer may designate.

Case No. 27. Setting, Installing or Sticking of Artificial Stone. (Disputants: Bricklayers and Plasterers.)

The Board decided that the setting, installing or sticking of all artificial stone which is reinforced with burlap or other fibrous material, whether cast or fabricated in shop, or on the job, is the work of the plasterer and cement finisher; and the setting, installing or sticking of all artificial stone which is not reinforced with burlap or other fibrous material is the work of the bricklayers, masons and plasterers.

Case No. 28. Plastering Work for Preparation of Walls, Ceilings, etc., for Tiling. (Disputants: Bricklayers and Plumbers.)

The Board decided that plasterers shall prepare or plaster all walls and ceilings which are to receive tile, except the final setting bed which shall be applied by the tile layers. Three bathrooms, vestibule and small halls in single residences shall be plastered by the tile layer.

Case No. 30. Petition to Amend Decision on Cutting Chases or Channels in Brick, Tile, Masonry, etc. (Disputants: Bricklayers and Plumbers.)

The Board decided that inasmuch as the question involved many other trades that the matter should be deferred, the Building Trades Department in the meantime to use its good offices toward having it amicably adjusted.

Case No. 33. Operation of Hand Derricks when used to Hoist Reinforcing Rods. (Disputants: Laborers and Iron Workers.)

The Board decided to grant a rehearing on the subject at the next meeting.

Case No. 34. Gunite Work, or Handling of Cement Guns. (Disputants: Hodcarriers, Plasterers and Bricklayers.)

The Board decided when work is to be of the thickness of 1½ inches or greater, the handling of cement guns shall be done by the laborers. When work to be performed is less than 1½ inches in thickness, the handling and control of the nozzle shall be the work of the plasterers and cement finishers. It is understood that this decision does not allow the laborers the right to finish where any finishing tools are required.

The decision on the following disputes will be reserved until the next meeting:

Case No. 3. Request for Rehearing of Dispute on Metal Trim in Hollow metal doors and trim for Elevator Enclosures. (Disputants: Sheet Metal Workers and Iron Workers.)

Case No. 29. Request for Rehearing of decision on Condo Base. (Disputants: Sheet Metal Workers and Electrical Workers.)

Case No. 38. Request for Rehearing of decision on Power Derricks. (Disputants: Bricklayers and Iron Workers.) Temporarily withdrawn pending agreement between the two trades.

Case No. 31. Installation of Slate Blackboards and Slate Partitions to Urinal Stalls. (Disputants: Bricklayers and Roofer.) Dispute adjusted by agreement, the Slate Roofers conceding the work to the bricklayers.

The Associated General Contractors in behalf of a number of members of the organization presented a request for a rehearing of the decision of the Board awarding the placing of reinforcing rods to the Iron Workers. A number of contractors urged the Board to reconsider its decision rendered in December, 1920, awarding form and metal dome work to the Carpenters. The request was denied.

The Board in executive session confirmed a ruling of Chairman Miller made recently on some work in Philadelphia in which he interpreted a decision of the Board and awarded the placing of metal trim and elevator doors to the Iron Worker.

OUTDOOR SWIMMING POOLS

There is a growing recognition of the desirability of and necessity for public swimming pools. Where one is found, it indicates a progressive and enlightened community. Naturally these swimming pools are found where bathing facilities are not available on river or lake beaches. They are planned to serve the special needs of the community. A comprehensive survey of the outdoor swimming pools in this country has been made by Stanley Pinel and the results published in Bulletin 61, Engineering Extension Department, Iowa State College, Ames, Iowa, entitled Outdoor Swimming Pools.

In this bulletin, Mr. Pinel describes and illustrates sixteen outdoor pools located throughout this country. The range of types is so large that the study of this bulletin will be of material assistance to persons who have the designing of such things in hand. The details of construction and the essential requirements are clearly explained. These minimum requirements can be extended and elaborated as means permit.

These are matters that should interest architects as public spirited citizens and their planning and construction are naturally their work. The bulletin will be found a valuable addition to the library of architects and engineers as well as public officials and laymen.

SHEARING TESTS OF LIMESTONE

An apparatus has been built by the Bureau of Standards for making shear tests on various types of stone. Preliminary tests with Indiana limestone indicate shearing values for this material of approximately 2000 lb. per square inch, or about one-third of the compressive strength. This property of stone is of considerable interest in connection with its use in structures but up to the present time very few determinations of shearing strength have been made.
VERTICAL TRANSPORTATION

BY H. D. JAMES*

The volume of traffic handled by elevators in our large cities is greater than that handled by our horizontal transportation systems, and the possibilities for increasing business in our cities today and for the successful handling of the increase depend more upon an efficient elevator service than upon the traction systems. The latter already have a valuable auxiliary in the automobile, but for the elevator so far no substitute has been found.

As cities grow and the size of buildings increases, the problem of the elevator system becomes more difficult. The ordinary building served by one or two elevators presents no system problems for the elevators are merely operated up and down in response to signals from passengers at the various floors. During portions of the time the elevators are entirely idle, and seldom is their full capacity required.

In large buildings, however, where there are a great number of elevators and constant service is required, a system of operation becomes advisable, and one of the operators, known as a starter, is stationed on the main floor to select the time each elevator leaves, it being his duty to maintain an even spacing between cars and, as far as his facilities permit, to avoid congestion. Under this system passengers on other floors wishing to take the elevator press a button which, by means of a signal light, causes the first elevator approaching the floor in the desired direction to be indicated. Department store elevators, it may be mentioned, stop at each floor and there these call buttons are not required.

In very large buildings it has been found advisable to give the starter some control over the elevators after they leave the main floor. With this in view, indicating boards have been devised which show the position of each elevator at any instant. Sometimes means of communication with the individual elevators are provided, enabling the starter to speed up an elevator by having it run by certain floors, the calls on those floors being transferred to the elevator next following. The dispatching system may be still further developed by giving the starter some control over the speed of the individual elevators, enabling him to maintain a better spacing between the cars. Another modern feature now on trial is a means for stopping the elevator at floors automatically, the argument for it being that it eliminates jerking the car back and forth at a landing, caused either by the operator's inability to gauge his stops accurately or his failure to understand a passenger's wish to stop in time to make the landing without reversing the car.

Very high buildings require the institution of local and express service. For example, a twenty story building may have one set of elevators serving the first ten floors and another the upper ten. Both sets stop at a common intermediate floor to transfer passengers who desire to travel between the upper and lower sections. Here, a proper distribution of the elevators is essential. Recently new difficulties have been presented in the tower type of building. If all the cars are run from the ground floor to the top, too large a percentage of the floor space in portions of the building would be given over to elevators. As the problem now more nearly approaches that of horizontal transportation, it is probable that it may be solved in the same way, namely, by having a few express elevators run the height of the building with only a few stops, the intermediate floors being served by local elevators.

Unusually good elevator service is necessary in commercial buildings, such as department stores, devoted to the selling of merchandise. The best selling floor is at the street level. Other floors become less desirable in proportion to their distance from the street level because it is difficult to induce the average person to travel to the upper floors. Especially is this true if the elevators are not of the best, and to overcome the customers' objections in this respect elevator service of the highest type is required. One outcome of the ef-
forts of department store managers to cope with the situation has been the removal of all departments not engaged in the direct display and sale of goods to customers, such as the offices, store-rooms, and packing and shipping departments, to the top floors of the building.

Furthermore, in the downtown sections of large cities street space often becomes too valuable to permit the parking of delivery trucks around department store buildings. One factor materially relieving the situation has been the replacement of horse drawn delivery vehicles by the automobile truck. This allows elevators to be employed to convey incoming trucks quickly and easily to the top of the building, where they can be unloaded and the goods lowered by gravity chutes to the other floors. Also, the trucks can here be reloaded and lowered to the street for outgoing delivery.

The storing of automobiles, both pleasure cars and trucks, in high buildings is also accomplished by elevators. Many garages in downtown districts are enabled by this means to use their upper floors for this purpose, greatly relieving the congestion on the street floor that would otherwise result.

Power operated elevators first came into use about the time of our Civil War. At first they were either driven by a steam engine or belted to a line shaft, the steam engine at that time being the universal source of power. Many modern elevators, both of the worm and spur gear type, resemble the old steam driven machines with the exception that an electric motor has been substituted for the steam engine. A little later hydraulic machines of various designs were developed.

The electric elevator, which is now the common one, was introduced about 1890. It was early realized that one of the great advantages of the electric motor for elevator service was the fact that it consumed power only in proportion to the load, and that where power was obtained from central stations there was no expense when the motor was idle. The hydraulic machine, although it had the advantage of smoother operation, consumed the same amount of power regardless of its load, because the water is pumped at a fixed pressure and the same volume of water is used for a trip irrespective of the load carried by the car. The hydraulic system also required a pumping station in the building, which had certain standby losses even when the elevator car was not in operation. This inherent economy of the electric machine has been the most important factor causing it to supplant the hydraulic. Still another has been the decrease in maintenance cost of the electric elevator. In its earlier stages the apparatus was not substantial, the art being young and experience mostly lacking, and the maintenance cost and the indirect cost incident to delays for repairs made such an installation expensive to maintain. But while the cost of upkeep of the hydraulic machine has not changed much since the early installations, the hydraulic art being an old one and its engineering problems well understood years ago, on the other hand the electric drive is still comparatively new and rapid strides are yet being made in improving the engineering features of the apparatus and in reducing its first cost, as well as its cost of maintenance.

With the advantage of economy of operation in his favor, it was long the ambition of the electric elevator engineer to make a machine that would operate as smoothly as the hydraulic, and he has at last triumphed beyond his expectations, for there is probably no hydraulic machine that compares in smoothness with the latest electric type, operated by what is known as the variable voltage system.

In studying the question of smooth operation it was found that the problem is one mainly of bringing the car up to speed smoothly and of retarding it smoothly, and not of its actual speed at any instant. Persons riding on an elevator are not usually affected by the speed of operation, but they are very sensitive to the rate of change of speed. By means of mathematical calculation as well as by actual tests, elevator engineers have been able to plot curves showing the maximum desirable rates of acceleration and deceleration of elevator cars, as well as what is theoretically the best shape of curve these should take.

The early rheostatic type of control did not approach this ideal curve and for this reason the electrical engineer for a long time was unable to obtain the smoothness of operation so much desired. Although the hydraulic machine does not conform to this ideal curve either, it is an improvement over the other because it does not have abrupt changes in speed similar to those incident to the rheostat control. But while the hydraulic machine can be adjusted to give a smooth start and stop, under these conditions the car is not accelerated as quickly as is permitted by the shape of the ideal curve.

Further studies in electric control indicated that greater smoothness was possible if a cushioning effect could be produced in the armature circuit of the motor. It was found that this effect could be obtained by placing a reactance coil in the circuit. The improvement resulting from the use of this coil at once established the electric elevator as a direct competitor of the hydraulic machine. Good results had previously been sought by the use of a large number of contactors for accelerating and decelerating the motor, but these required careful adjustment which was affected by dirt, variation in weather conditions, and other agencies, which necessitated continual attention to maintain smooth operation. An experienced elevator engineer could go from one building to another, both using identical equipment, and compare the industry and ability of the electricians in charge of the elevators by noting the relative smoothness of operation of the systems.

When the reactance coil was employed it was
found that this invention helped to make the operation inherently smooth, making it possible to use fewer contactors and reducing in consequence the difficulty experienced from the control’s getting out of adjustment.

The greatest step forward in elevator systems was made when the relatively old system of variable voltage control was improved for elevator use. With this system an individual generator is provided for each elevator motor. The voltage supplied by the generator depends upon the strength of its field, and the strength of the field can easily be increased or decreased by turning the handle of a small rheostat in the circuit back and forth. This voltage is applied to the motor, the motor speeding up when the voltage increases and slowing down when it decreases. By placing the rheostat in the master switch of the elevator car and causing it to be operated by the switch handle the operator can change quickly and smoothly to any speed within the range of the motor.

Elevators were operated from a system of this kind about the year 1900, but at that time electrical engineers did not have sufficient design and test data at hand to enable them to proportion the characteristics of their motors and generators so as to overcome certain inherent difficulties and get the best results. With present design knowledge, however, machines can be built which have certain definite time characteristics in themselves, so that the rate at which the speed of the car changes is controlled by the design of the machine and only a small amount of adjustment is required in the control.

Elevators operated from this system can be accelerated and retarded faster than any other type. This results in a great saving of time in handling passengers between the floors of a build-

**VIEW OF ELEVATOR MACHINE ROOM IN DEPARTMENT STORE FOR JOSEPH HURNE COMPANY, PITTSBURGH, PA., SHOWING THE APPARATUS REQUIRED FOR VARIABLE VOLTAGE CONTROL. AT THE LEFT ARE THREE MOTOR GENERATOR SETS; AT THE RIGHT THE CONTROL PANELS AND WINDING MACHINES**
to slow down and stop. With most types of elevators this means one point with one load and a different point with another, because with most hydraulic and electric elevators the speed varies with the load. Since the operator largely judges his rate of speed by the location of the handle, his judgment is seriously impaired if the handle when in a given location results in one speed with one load and a different speed with another, rendering his problem of making accurate landings very difficult. Design engineers express this marked slowing down of a motor under heavy loads by saying that the regulation of the motor from light load to heavy load is poor. This regulation can be corrected to some extent by certain changes in the design of the motors and generators, but as long as several elevator motors are supplied from a common generator, it is impossible to adjust a single generator so as to obtain good regulation of all the motors under the differing conditions obtaining at any one time. When, however, each motor has its own generator, as in the variable voltage system, both can be designed to get good speed regulation not only at full speed but also at the very slow speeds used in making a landing. The speed is practically independent of the load in the car and there is, therefore, a definite speed for each position of the control handle. The operator can soon learn to judge his stops and make them with little loss of time, and hence with this system the time required for making landings is reduced to the minimum. It is possible that this improvement of the speed regulation may do away with the necessity for automatic leveling by means of locking bars or secondary sets of gears which, because of the poor speed regulation inherent in rheostatic controllers, has been tried in a number of recent installations.

Another improvement made possible by the variable voltage system appears when the elevator is made to descend rapidly. When descending with a full load, the usual system of control permits a rate of acceleration of the car which closely approaches a free fall, the only retarding forces being friction and the inertia of the rotating parts. When the motor is thus being driven by the load and exceeds its normal full speed, a generator action results which causes a current to flow back from the motor to the line. This generator action increases very rapidly with a small change in motor speed so that the effect on the passengers is first the sensation of actually falling, followed by a rapid retardation of speed as the retarding action of the motor becomes great enough to balance the load. Anyone who has ridden on the ordinary high speed elevator has probably noticed this unpleasant effect. Electric elevators which are operated from a single source of supply usually have this same effect to a greater or less extent and the same is also true of the hydraulic elevator though not in such a marked degree.

With the variable voltage system the passenger has the sensation, not of a free fall, but of a rate of travel definitely under control. He feels a very definite pressure underneath his feet during the downward motion of the car even when it is fully loaded, resulting in a feeling of security. This is due to the fact that, since each motor is connected to its own generator, the rate of acceleration is directly controlled by the change in voltage of the generator. The result is that the motor is generating power at all speeds from the start going down until the car is operating at its highest speed. The difference in sensation can perhaps best be understood by riding in elevators typical of the different systems.

A further advantage of the variable voltage system appears in connection with the modern power systems. Formerly, wherever possible, elevators were operated from direct current power. The direct current systems, however, are everywhere being replaced by alternate current systems of distribution, making it necessary to install motors driven by alternating current or machinery, such as motor generator sets or rotary converters, to convert the alternating to direct current for elevator service.

When alternating current motors have been used, they have proved satisfactory for freight and slow speed passenger service, but the induction motor has certain inherent characteristics which make it difficult to apply to high speed service. It also takes a large amount of power during the accelerating period. Improvement has been sought by changing its design, but at best the problem is difficult and few elevator engineers would recommend such an installation for high grade office buildings or hotels.

When direct current cannot be obtained for high class service, therefore, it has been usual to convert the alternating current by the employment of motor generator sets or rotary converters. With the variable voltage system, a separate generator is provided for each motor and the alternating current without conversion is used to drive the individual motor generator sets. When power factor correction is made advisable by the rules of the power company, this system also permits the use of synchronous driving motors to accomplish this purpose. In addition, automatic means can be provided for starting and stopping single motor generator sets, so that a set may be shut down and all standby losses eliminated when any elevator is not in use. When, however, a rotary converter or motor generator set is designed to operate the entire bank of elevators, it must be kept running at all times, including the inactive periods of the day and night, and the total cost of power is, therefore, larger than that required with the variable voltage system.
A

N interesting report has just been published of a decision by the Court of Claims, in a suit by a contractor, instituted some time ago for damages based on the claim that the specifications under which the bid was made and the contract entered into were inaccurate. The work involved was excavation work covering something over ten miles on the barge canal. The cost of the excavation depended, in large measure, on the nature of the material to be removed. The contractor claimed that the State's records showed the existence of hardpan and "hard" and "very hard" material, and that the State engineers substituted the words "clay, sand and gravel," or similar words, the inference from which was that the excavation work would not be difficult.

The Court is reported to have sustained the contention of the plaintiff that the specifications were inaccurate, that the excavating was a much more difficult proposition than the agents of the State had indicated in the plans and specifications, and that the representatives of the State must have known that the plans and specifications prepared did not give an accurate description of the material which the contractor was expected to excavate, and was softer and easier of excavation than was actually the fact. The plaintiff was awarded a large sum in damages. The decision of the Court, if rendered as reported, and if the facts found are as the report states, would seem to be good law and of special interest to architects.

If the plans and specifications indicate the existence of certain conditions, whether these have reference to excavation work or otherwise, and the contractor, on the basis of the representations contained in the plans and specifications, submits his bid and enters into the contract, he should certainly be entitled, in fairness, to recover the damages occasioned to him by his so doing, if he can prove that the conditions were other than as represented, and especially if he can prove that the true conditions were known to the owner or to the architect or should have been known to them, had they exercised reasonable diligence.

In many cases, the contractor will be required under the contract to make his own tests and examination of the proposed site, before submitting his bid. Where this course is followed and no representations are made in the plans and specifications or otherwise, the contractor will be bound by his bid, and will not be in a position to claim damages as against either the owner or the architect. It is apparent, therefore, that an architect should be diligent to check and verify his facts in any case where he indicates in the plans or specifications the existence of special conditions which are material elements affecting the cost of the work to the contractor. If any survey be furnished to the contractor by the owner or any statement of facts relative to the site or building operation be so furnished, the architect, in so far as the matter is within his knowledge or under his control, will do well to assure himself that the facts stated are accurate. The better and safer course, wherever possible, will be so to draft the contract or requests for bids, that the verification of all essential facts of this character rests upon the contractor.

The foregoing considerations will apply with equal force to the other situations which characterize the building operation. It is unwise for the architect to make any unnecessary representations either to the client or to the contractor. It is very natural that, in discussions or correspondence with them, he should thoughtlessly make statements with respect to cost or site or any one of a dozen other elements concerned in the operation. Unless, however, it is necessary that he do this, he will do well not to commit himself. Representations which, when made, seem entirely harmless, may later assume entirely different aspects, and result in perplexities and considerable loss. If the architect, in dealing with the contractor, makes any representations to the latter in behalf of the owner, he should make it clear that the statements which he makes are based on the facts as given to him by the owner, and that he is acting merely as spokesman for the latter. Similarly, in dealing with the owner, he should not state to him, as facts, representations made to him by the contractor, without making it clear that he is transmitting merely the contractor's statement of the case.

In the course of his employment, the architect is naturally called upon to make statements and findings as the work progresses. This is especially true of his work in supervising the construction. Aside, however, from these manifest and proper duties, he should studiously avoid commitments, verbal or otherwise, which may not be understood or which, if understood, may be later used to embarrass him. It may seem rather trite to say that in any statements or representations made, he should be sure of his facts before stating them. Nevertheless, the caution is not at all an idle one, in view of the many times that an architect does make statements which he believes to be accurate, but which he has not suffi-
ciently verified. His troubles are sufficiently numerous at the best, before his relationship with the client and with the contractor has been happily and successfully terminated. There is no need to add any unnecessary difficulties or to provide any unnecessary grounds for misconstruction or dissatisfaction.

LEGAL DECISIONS

UNDER a building and construction contract, the terms were such that the work to be performed covered a very considerable period of time. It was necessary for the contractor, in order to carry out the terms of the agreement, to expend large sums of money. The contract provided that the payments to be made should be based upon the amount of the work performed. The question arose between the parties, whether it was necessary, under the contract, for the contractor to perform, before payment of the amounts due him was made. The court held that where, as in the foregoing case, work covers a considerable period and the contractor is called upon for large expenditures and payments based on the amount of work done, the covenant to perform undertaken by the contractor is dependent upon the covenant to pay and that, unless the covenant to pay is faithfully adhered to, the covenant to perform cannot be enforced.

Steel Co. v. Construction, etc. Co., 114 Atlantic 780.

In the case last cited, it appeared, also, that the contractor had substantially complied with the contract to pay and had in good faith liquidated all sums which it believed were due. The additional question arose, under these conditions, whether the sub-contractor was justified in abandoning the work and whether the contractor was entitled to any time within which to comply with a demand for payment, before the abandonment of operations by the sub-contractor. The court held that a sub-contractor is not justified in abandoning work where the contractor has substantially complied with his contract to pay, and has paid, in good faith, all monies which it believes to be due. The court further held that the contractor should be given a reasonable time within which to comply with a demand for payment, before the operation should be abandoned.

(Editor's Note) In considering the above decision, it is well to bear in mind that the wording of the contract, in any case is, in the last analysis, the controlling factor. If the contract, by its terms, clearly provides that the covenant to perform is not dependent on the covenant to pay or that absolute rather than substantial compliance by the contractor is necessary, or specifies a given time after which the sub-contractor may abandon the operation, the decision of the court will be controlled by the contract terms. If, for instance, the contract provided that the sub-contractor might abandon the work provided the contractor did not make payment within one day after demand therefore, the sub-contractor would have the right to abandon the work on the expiration of that day, if payment had not then been made. The doctrine of reasonable time for the performance of an act by a contracting party is one which is invoked by the courts in cases where the contract is silent as to the time within which an act is to be performed or upon the expiration of which a right accrues.

A CONTRACT provided that the contractor should install a heating plant. In order to do so, it was necessary for a portion of the foundation wall of the structure to be removed. The contract did not require the contractor to replace the portion of the wall which it was necessary to remove. The contractor entered upon and performed the work and thereafter the house settled and it was found that the settling was due to the removal of the wall by the contractor. It was also found, however, that the work of the contractor was performed with proper care and that there had been no negligence on his part. The court held that, under these conditions, the contractor, having performed his services in accordance with the contract and without negligence on his part, could not be held liable for the damage caused by the settling of the house.

Hardware Company v. Freeman, 198 P. 711.

A CONTRACT provided that, upon the failure of the contractor, after notice by the owner, to make adequate provision for the work, the owner should have the right to supply the contractor with the men and materials necessary to complete the work within the time specified in the contract. Upon the failure of the contractor to provide a sufficiency of men and materials, the owner, under the foregoing provision of the contract, took possession of the building and assumed charge of the work. The court held that this, under the contract term, was a violation thereof, and that the owner was not authorized to take charge of the work by virtue of the provision of the contract above referred to, but only to supply, as therein stated, the necessary men and materials to the contractor. The court further held that a notice given by the owner to the contractor, after the owner had violated the contract by taking possession of the building and taking over the work, was ineffective.

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DETIAL OF SHOP FRONT

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T. BEVERLEY KEIM, JR., ARCHITECT AND ENGINEER
DETAIL OF SHOP FRONT FOR HENRY D. CANE, LOS ANGELES, CAL.
T. BEVERLEY KEIM, JR., ARCHITECT AND ENGINEER
DETAIL OF STORE FRONT FOR DR. N. W. & H. B. GOODMAN, LOS ANGELES, CAL.

T. BEVERLEY KEIM, JR., ARCHITECT AND ENGINEER
DETAIL OF A GROUP OF SHOPS IN LOS ANGELES, CAL.

T. BEVERLEY KEIM, JR., ARCHITECT AND ENGINEER
BENEFIT STREET ELEVATION

SOUTH MAIN STREET ELEVATION

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SIXTH FLOOR

FIFTH FLOOR

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SPECIFICATIONS

BRICK MASONRY SPECIFICATIONS (Continued)

THE waterproofing of parapet walls is a subject that merits more attention in the writing of specifications than in the preparation of drawings, although the ultimate object of the specifications must be understood by the draftsman. The drawings must be prepared accurately to indicate the work necessary. Many roofs are said to leak when as a matter of fact it is the parapet walls themselves that are leaking. A guarantee for roofing generally will be found to cover only the main roof surfaces while the guarantee for flashing either is avoided or is specifically omitted. Probably the reason for this avoidance of responsibility is a recognition by the roofing contractors that equity demands that they accept guarantees on flashings when the contractor has nothing to do with the construction of the walls or other intersecting surfaces that are flashed. It is the rare roofing specification that calls for a guarantee on flashing and if the specification writer is careful to construct his parapet walls in a watertight manner, and so construct them that they will remain weatherproof for the term of the roofing guarantee, he may be well assured that the roofing contractor will not hesitate to guarantee the flashings under the normal conditions that govern the warranting of results in building construction.

It may be said that the main objection to parapet walls structurally is the seeming ignorance of causes for the effects that everyone may notice within a block of his office. Weathering has a most deteriorating effect on masonry that has both sides exposed to the weather, and especially where there are a large number of joints including vertical joints with top exposed surfaces. The roof construction itself may have some effect on a parapet wall. If the construction is of concrete there may be expansion, which expansion may have been neglected by the designer, because he has failed to comprehend the importance of careful study of expansion in construction, a condition rarely visible after the building is finished. If the roof pitch has been accomplished by means of cinders, they may be soaked while being placed, with the consequent expansion in volume which, of course, would rupture the masonry construction. If the roof construction is of wood, expansion of the construction may have some effect, or the warping and twisting of the timber may be involved in the causes. Almost any form of roof construction as a matter of fact, may be regarded as a contributing factor in poor parapet wall construction and stability, especially if it is poorly designed and inefficiently supervised.

Parapet walls, and this term, by the way, includes all walls having both sides exposed to the weather, such as vent stacks, smoke flues, garden walls, and so forth, should have the minimum number of joints and the joints that will be vertical with the top exposed surfaces, must be reduced to a minimum. The quality of the brick itself, or of the stone or terra cotta, must be studied and assurance must be had that saturation by moisture, especially in driving rain, will not occur to a very great depth. Of course the use of vitrified surfaces, or surfaces of practically non-absorbent character, are the most desirable, both for the facing of parapet walls, and for the coping and covering.

The wall construction below the level of the roof must form a solid substantial foundation and if the parapet wall is of sufficient height to require it, must have sufficient counterbalance for ties or anchorages. As indicated in previous articles, the mortar for parapet wall use should be a waterproof mortar. This may be a Portland cement mortar which is made with sand that is of good quality with respect to range in sizes of grains, or the cement mortar may be waterproofed with one of several integral waterproofings that apparently have proved successful in previous use. It may be trite to repeat that the qualities of integral waterproofing must be thoroughly investigated before use, especially if they are to be depended upon for real waterproofing work. If lime gauging is to be used for fattening the mortar, just the right quantity to permit the proper degree of fineness and no more must be specified. This may be best gauged by experience in the use of local materials, but as a general rule, lime gauging, not exceeding six to ten per cent, should be used.

If brick is to be used, it should be vitrified brick for the exposed facings with the usual run of common brick for the center part of the wall. Where face brick must be used to carry out the design of the building or the use of materials, it will be expected that such brick will be of good non-absorptive value. Where terra cotta or limestone occurs, the non-absorptive surface is to a large extent provided and such facings are especially desirable for the reason that the number of joints is reduced very greatly. It should not be necessary in walls faced with common brick to extend the common brick through the height of the parapet wall. The difference in color or texture of vitrified brick as compared to common brick should not be objectionable, especially when the results to be accomplished are to be considered. The wall copings it is expected will be of
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terrasota, stone, concrete or vitrified, salt glazed tile. Brick copings are not considered in this category as they are most inefficient in good construction and should only be allowed where the design requires them, and the architect knows that they must be repaired constantly. Brick parapet copings may be made watertight but the material required will, to a large extent, nullify the artistic use that should be the governing factor.

The parapet walls should be not less than 12" thick, and sufficient bracing of masonry in the form of piers, or buttresses, or of some other character, should be provided, to withstand the anticipated wind load, without causing hair cracks which may be seen quite often at the roof level, or one or two courses above this plane. intersecting cross walls, of course, supply anchorage which is sufficient if the walls are not over 40 ft. apart. In the case of high parapets, special precaution must be exercised in the strength of construction. If copings of terra cotta or stone or if other projections of similar materials occur above the roof level, their anchorage, depth of penetration, and general fitting into the masonry work must be considered. If the parapet walls are pierced with open spaces, and especially if these spaces are filled with balustrades a rather dangerous condition will occur unless the peculiarities of such construction are understood. It is unfortunate that in many cases where pierced parapets are used, the lower rail of the balustrades will be within 6 in. of the roof level and oftentimes closer. In such event the flashing of the roof cannot be accomplished without the use of metal, and the placing of counterflushing is particularly difficult. Wall penetrations, furthermore, provide a third surface which is the jamb surface, that will offer just that much more exteriorly exposed surface.

All the masonry materials in parapet walls with the exception of limestone, should be laid in waterproof mortar. Limestone must, of course, be laid in lime mortar or in a cement mortar for which white or non-staining Portland cement is used. The specification writer may find in his available market, one of the patented brick mortars or cements that will not stain limestone, but of this quality he must be assured. Accurate information on the content of iron oxide will usually indicate whether or not such mortars will stain limestone. Inquiry may of course be made to the Indiana Limestone Quarrymen's Association. This subject will be more fully covered later in the discussion on specifications for setting of limestone. All joints, both vertical and horizontal, must be slushed solid with the mortar and the brick should be laid plumb and level so as not to provide water tables for the gathering of moisture and frost at the joints. The mortar joints should be troweled and pointed in a weathered joint or in a flush joint. One of the most vulnerable points in parapet wall construction is the top surface on which the copings are set. One method for waterproofing these surfaces requires the placing of a smoothly troweled, level, mortar bed on top of the brick masonry wall, conveniently below the coping. If the coping will permit it, brick should be arranged to project one or one and one-half inches above the masonry wall level to provide keys for the coping. Over this waterproofing coat, there should be spread a troweled coating of elastic cement that will not stain the materials with which it comes in contact, and if necessary, of a color matching the color of the facing materials. This coating should be not less than one-sixteenth of an inch thick, and the elastic cement must be of a consistency required for correct application. It should not be an elastic cement that will require sanding, and it should be sticky enough to require that the trowels be kept wet while they are being used. On top of this waterproofing coat, the final coping should be set, bedded in the waterproof cement mortar used for the rest of the work. The joints in the copings and the joints immediately under the copings on either side of the wall should be filled to within one inch of the faces with elastic cement, colored to match the finished material. This elastic cement must be made for caulking use, and it must not crack or disintegrate in freezing weather or run out in warm weather. Where copings project beyond the face of the walls, this elastic cement should be applied to the under face of the vertical joints as well as to all other faces. The horizontal joints immediately under the copings should be caulked similarly. As a matter of fact, no finished pointing or caulking of any of these joints should be done with any material except an elastic cement. Further assurance of constructing a watertight parapet wall may be had by specifying that a trowel-applied elastic cement coating, be applied on the inner, or roof side faces or other faces not exposed to general view to a thickness of about one-sixteenth of an inch, unless the material has sufficient body to remain in place in a thickness of one-eighth of an inch. This coating should be applied over the entire surfaces extending from underside of coping down to and over roof flashings and counterflushing. These surfaces then will be covered with watertight skin, which practically removes the parapet wall from the condition of having both sides exposed to the weather. It is probably not any more expensive to resort to this than it would be to point the mortar joints with elastic cement. Corners and all angles of parapets should be reinforced with strap or bar iron, or should be so constructed that they will not open up.
June 22, 1923.

In the preparation of the plans and specifications for the heating of the Land Bank Building, 16 West 10th St., this City, the question regarding temperature regulation was discussed and the Architects, Messrs. Keane & Simpson, requested me to get some data on the subject. Accordingly I investigated the cost of heating in four Kansas City buildings: the Chambers Building, 12th & Walnut, the Reliance Building, 10th & Modes, the Waldheim Building, 11th & Main, and the Rialto Building, 9th & Grand Ave.

The Chambers Building and the Rialto Building are equipped with automatic temperature regulation. All of the buildings, at the time the tests were made, were heated by the Kansas City District Heating Company and the following information was taken from data on file in the offices of this Company:

To heat these buildings, the following number of pounds of steam were required per thousand cu. ft. of space:

- Chambers Bldg. with Temp. Regulation: 3840#
- Reliance: without: 7200
- Rialto: with: 3500
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Serial No. 11.10

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16. Construction Plant:
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24. Sash Slots:
25. Brick or Stone Ties:

26. Setting Miscellaneous Iron and Steel:

VII. SCHEDULES

27. Field Operations:

VIII. RESULTS

28. Inspection and Rejection:

29. Guarantees:

HISTORIC JUMEL MANSION TO BE IMPROVED

THE Committee for the Restoration of Jumel Mansion, at 160th Street and Edgecomb Avenue, New York City, General Washington's headquarters in the Revolution, met recently and approved the plans of Charles A. Platt, architect, to lay new pathways, rearrange the grounds, provide rest benches for the public, fence in the park and build a separate brick fireproof building for the heating apparatus. This brick building would also house the gardener and contain an office for the Department of Parks.

Attention was drawn to the fact that since the property was purchased by the city in 1903 there has been very little spent upon the building and grounds. The basement of the mansion is to be restored in its original form and the little wooden kitchen at the rear removed on account of fire risk.

The official designation of the mansion grounds is Roger Morris Park.

VICTOR D. BRENNER, MEDALLIST, DEAD

VICTOR DAVID BRENNER, medallist and sculptor, designer of the Lincoln penny, died recently in New York. That an immigrant artist should have modeled one of the famous heads of Lincoln has been spoken of as significant of the spirit of America, which Brenner spent his life in interpreting. Brenner was born in Sha­vely, Russia, in 1871.

THE FIFTH AVENUE ASSOCIATION TO HOLD COVER DESIGN CONTEST

THE Fifth Avenue Association, Inc., offers a cash prize of Five Hundred Dollars ($500. 00) for the best cover design for a historical book of Fifth Avenue, to be issued in connection with the Centennial Celebration of the Opening of the Avenue. It becomes of the first importance, therefore, to give a clear description of the purpose of this Centennial Celebration, and of the contents of the historical souvenir book for which a cover design is sought, symbolic of the Centennial and the spirit of Fifth Avenue.

The official opening of Fifth Avenue was approved in the Autumn of 1824. In the Autumn of 1924, Fifth Avenue will commemorate this event, and in a series of displays, exhibits and pageants, the Fifth Avenue of today will show the momentous developments which have taken place in the one hundred years passed. In order to have a permanent record of this Centennial Celebration, and at the same time to have an authoritative history of Fifth Avenue, The Fifth Avenue Association will publish a souvenir book with historical text and illustrations, and for this proposed book it seeks a cover design that will summarize the manifold phases of the present day Fifth Avenue, as inspired by its history. This will be the only official book of the Centennial and no other book will be endorsed by The Fifth Avenue Association.

A very comprehensive circular and one that will be helpful to competitors may be had by addressing The Fifth Avenue Association, Inc., 358 Fifth Avenue, New York City.

RAILROAD CHAIR AT YALE

THE Association of Railway Executives has established at Yale University a professorship of transportation in memory of T. DeWitt Cuyler, Yale '74, according to an announcement made recently by the university Secretary. The endowment for this chair amounts to $125,000 and represents gifts from members of the association and friends of Mr. Cuyler.

Winthrop More Daniels will be the first incumbent of the Cuyler professorship. Mr. Daniels's field is in the economics of transportation, and he has written much of economics and public utilities.

YALE DEDICATES FORESTRY BUILDING

YALE UNIVERSITY, a pioneer in forestry conservation, which has given to the United States three national foresters and established the largest forestry school plant on the continent, recently dedicated a new home for that department. Sage Hall was formally transferred from the family of the donor, William Henry Sage, Yale '65, to the University.
Wayne Rapid-Rate Water Softeners
Economical to Buy and to Operate

No Moving Parts. No Chemicals. No Expert Attention Required. No Storage Tanks Needed

Simplicity is the keynote of the Wayne rapid-rate Water Softener. Only 3 plumbing connections are necessary—to supply main, to service lines and to the drain.

No chemicals are used to soften the water. The softening action is a natural attribute of the Wayne processed mineral—which has the natural quality of removing lime and magnesia from the hard water as it flows through the Softener at the regular supply pressure.

By means of the Wayne two-unit installation, costly storage tanks are eliminated and continuous supply is assured under all circumstances.

Regeneration Quick and Simple
The complete regenerating process with the Wayne rapid-rate Softener takes only 20 minutes—including back-washing, salting and flushing. All 3 operations are controlled by a simple system of 5 valves, which are plainly marked.

Costs are Very low And the Savings Quickly Pay for It
Wayne rapid-rate Industrial Water Softeners range in price from $600 up, according to capacities. Any plumber can make the installation in a few hours.

Operating costs are the very minimum—as only common table salt is needed in the regeneration process. The salt does not come in contact with the water supply—as it is flushed out into the drain.

Wayne Softened Water eliminates boiler-room expense caused by hard water scale in boilers, water pipes and heaters. It saves coal; saves repair and replacement bills. Wayne Softened Water is far better for bathing, shampooing and shaving, and much better to drink and to cook with.

The Wayne Mineral itself is practically indestructible. The tanks and valves are of finest materials—built to give long years of service.

Complete information on request. Write today for the facts which prove that the Wayne is America's most satisfactory Water Softening System.

Wayne Tank & Pump Co., 865 Canal Street
Fort Wayne, Indiana

Division Offices in: Atlanta, Boston, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Dayton, Des Moines, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Memphis, Minneapolis, New York, Omaha, Philadelphia, Pittsburgh, San Francisco and St. Louis

Warehouses in: Philadelphia and San Francisco

British Offices: Toronto, Ontario, Canada

In London: Wayne Tank and Pump Co., Ltd.

In Paris: Wayne Tank and Pump Co., S. A.

An International Organization with Sales and Service Offices Everywhere

WAYNE
RAPID RATE
Water Softeners for Household and Industrial Purposes
A CORRESPONDENT to The Architect, London, has the following to say as to the
proposed advertising conference to be held this Summer in London:

I have noted in the press of late that an important Conference of Advertisers is soon to be
held in London, the American organizers of which
state that advertising in England is “still in its
infancy,” in consequence of which a huge adver-
tising campaign is to be launched from one end
of the country to the other.

I am strongly of opinion that should this be
successful it will be at the expense of our few
treasured possessions in the way of landscape
architecture, etc.

I for one certainly think that already we have
far too many posters, and that the ever-increasing
electric sky signs of the West End are vulgar and
inartistic at night, while their appearance during
the day, “sprawling right across architectural re-
finements” which are the product of years of
study, is greatly to be deplored.

If, on the other hand, the advertisers really
wish to improve English advertising, why not en-
courage really “artistic” posters, and, in lieu of
our present garish night signs, “floodlight” the
buildings, as a few West End firms have done?

I feel sure that if the Conference follows some-
thing on these lines it will achieve success, pro-
duce a “Brighter London,” and at the same time
encourage an appreciation of architecture, which
appears to be sadly lacking in this country at the
present moment.

UNEARTH A GREEK CITY

FRENCH archaeologists working in Syria have
discovered at Saliyeh, in the Euphrates re-
gion, a Greek city founded just after the death
of Alexander the Great, 2,246 years ago, and
abandoned in 273 A. D., when the desert sands
covered it.

Among the objects dug from the ruins are a
number of parchments, one of which, written in
189 B. C., is said to be the oldest Greek manu-
script extant. The scientists also uncovered a
series of mural paintings of exceptional impor-
tance as a source for the study of Byzantine art.

NEW BUILDINGS FOR PARIS

THE Paris Municipal Council, it is learned,
has recently voted twenty-one million francs
to be applied to the demolition of houses consid-
ered to be unhealthy and the erection of new
buildings conforming with modern ideas of
hygiene.

PERSONALS

Heacock Hokanson, architects, have moved
their offices from 1218 to Suite 905, 1211 Chest-
nut Street, Philadelphia, Pa.

Emery Stanford Hall, A.I.A., has moved his
office and studio from 64 East Van Buren Street
to Suite 1306, Tacoma Building, 5 North La Salle
Street, Chicago, Ill.

Robert Peal, architect, has moved his office to
206 Leonard Building, 2014 East 105th Street,
Cleveland, Ohio, where he will continue in the
practice of architecture, specializing in residence
work.

Harry E. Warren, architect, has moved his of-
cices to 247 Park Avenue, New York City, the
firm of Jailade, Lindsay & Warren having been
dissolved. Manufacturers’ catalogs and samples
are desired.

Frederick A. Elsasser, architect, announces that
he has opened an office at 855 Broad Street,
Newark, N. J., for the general practice of archi-
tecture. Manufacturers are requested to send
catalogs and samples.

B. Albert Conn, architect, announces the open-
ing of his office for the general practice of archi-
tecture at 20 West Jackson Boulevard, Suite 1615,
Chicago, Ill., where he would be pleased to have
manufacturers send catalogs and samples.

Brickey & Brickey, architects, 212 North Lan-
caster Avenue, Dallas, Tex., have opened new of-
cices at 611-612 State National Bank Building,
Houston, Tex. Manufacturers’ catalogs and sam-
ples would be appreciated at the Houston office.
Free Aids to Production

Every installation of Truscon Continuous Sash incorporates an abundance of fresh air and daylight—the free aids to production.

This type of window literally makes a hinged glass roof that can be opened and closed at will. When open, the glass canopy affords protection against inclement weather.

Long or short runs of Truscon Continuous Sash may be used singly or combined one above the other. They may be installed on a slope or in the vertical plane. All types of Truscon Continuous Sash are controlled by means of Truscon Mechanical Operators.

Beside Truscon Continuous Sash, there is a wide variety of other types of Steel Windows.

A corps of daylight engineers in 48 principal cities are at the service of architects, without the slightest obligation, to help solve any steel window problems.

TRUSCON STEEL COMPANY, Youngstown, O.

WAREHOUSES AND SALES OFFICES FROM PACIFIC TO ATLANTIC.

FOR ADDRESSES, SEE PHONE BOOKS OF PRINCIPAL CITIES.

CANADA: WALKERVILLE, ONT. FOREIGN DIV. NEW YORK.

REFERENCE LIST OF BUSINESS LITERATURE

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

This list of the more important business literature or 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, etc. 16 pp. Ill. 6 x 9 in.

AIR CONDITIONING—See also Ventilation and Heating

The Bayley Manufacturing Company, 722-726 Green Bush St., Milwaukwe, Wis.

490. Bulletin No. 25. 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 specifications. 22 pp. Ill. 7 1/2 x 14 in.

ANCHORAGE EQUIPMENT

Midwest Steel & Supply Co., Inc., 100 East 45th St., New York City

662. Glass & Metal Anchoring. By James K. Rider. 27 pp. Ill. 5 1/2 x 8 1/2 in.

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. 280 pp. Ill. 8 1/2 x 11 in.

ASBESTOS ROOFING—See also Roofing

The Philip Carey Co., Lockland, Cincinnati, Ohio

147. Asbestos Tar Paper. By Allan E. Moreland. 130 pp. Contains information about asbestos; data on Carey Prepared and Build-up Asbestos Roofing; pictures of buildings on which they have been used. 15 pp. Ill. 6 x 9 in.

ASH HOISTS—See also Lumber, Roofing

Gills & George (Hansen), 346 West Broadway, New York, N. Y.

332. General Catalogue. Contains specifications in two forms, (1) using manufacturer's name, and (2) without using manufacturer's name. Detail in 1/4 in. scale for each typocological model and section, 344 pp. Ill. 7 1/2 x 10 1/2 in.

BATHROOM EQUIPMENT

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

710. The Orleans Hygiene. A file card for reference in specifying cabinets of different kinds to contain toilet papers and paper towels. 2 pp. Ill. 6 7/8 x 11 in.

BULKHEADS

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

102. 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 3/4 x 9 7/8 in. 55 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. Brick handbook and elevations of small brick houses, descriptions, useful tables and suggestions are illustrated. Size 7 x 9 3/4 in. 50 pp.

182. The Home of Beauty. A booklet containing fifty price designs of brick and facing in standard sizes and a description of the 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 CONSTRUCTION


563. Report on Gutta Percha. A report of fire tests made by Underwriters' Laboratories on Gutta Percha, 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. 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. 8 1/2 x 11 in.

Curtis Companies Service Bureau, Cincinnati, Ohio.

622. Better Built Houses. Vol. XIII. This volume contains floor plans and perspectives of 21 two family houses. The designs were made by Trowbridge and Ackerman, Architects, New York, and illustrations rendered by Ira and 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.

McKown Co., 21 East 44th St., New York, N. Y.

434. Clear Floor Space. A folder showing uses and advantages of McKown "Latitii" and "Flooring" long span wood roof trusses. 4 pp. Ill. 8 1/2 x 11 in.


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

Truscon Steel Company, Youngstown, Ohio.

317. Truscon Floortyle Construction. Form D-210. Contains complete data and illustrations of floor type installations. 16 pp. Ill. 8 1/2 x 11 in.


319. Truscon Building Products. Form D-206. Contains a brief description of each of the Truscon Products. 112 pp. Ill. 8 1/2 x 11 in.

320. Modern School Construction. Form D-207. Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 10 pp. Ill. 8 1/2 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 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

BULLETIN BOARDS


588. Clark Directory and Clark Changeable Bulletin Board and Directories for Office Buildings, Hotels, Business Buildings, etc. 8 pp. and 4 Ill. 6 x 9 in.

The Tablet & Ticket Co., 1015-1021 West Adams St., 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. 34 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 installed steel medicine cabinet for bathrooms. 20 pp. Ill. 4 x 6.

CAREMENTS—See Doors and Windows

CEDAR LINING—See Lumber

CEILINGS, METAL

The Edwards Manufacturing Company, Cincinnati, O.

192. Pamphlet of 52 pages describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7 x 10 in.

CELLAR SASH—See Doors and Windows
Save form work and labor costs

through early removal and speedy re-use from floor to floor. With less concrete, steel and form work, labor costs are considerably reduced.

Of heavy gauge sheet steel, accurately shaped and reinforced—the most rigid forms on the market. Runways can be placed directly on the forms. They save eight to ten per cent in concrete quantities over other style, light gauge forms on account of their rigidity and special shape. Additional saving of concrete quantities is gained from their angled corners.

The numerous advantages of Meyer Removable Steelforms are being employed daily in outstanding structures all over the country. It is not enough for you to accept this fact generally. Permit us to PROVE their features and savings in your next building.
COLUMNS

Specimen Set for Prot. Exner's Column. A catalog containing descriptions of the various grades of column and specifications for their use for all purposes and functions and directions for use, 20 pp. 8 x 11 in.

The Carney Co., Mankato, Minn.

449. Broad That Guarantees the Wall. Attractive catalog for architects, engineers, contractors, and dealers. Describes fully the characteristic, durability and economy of this nature of mitered cement, and states that requires no time. Contains simple formula for mixing and illustrations of Carney-laid buildings. 24 pp. Ill. 8 x 11 in.

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

509. Perfected Cement. An attractive circular describing late improvements in manufacturing the material, cost-comparisons, physical tests and specifications for use. 4 pp. Ill. 8 x 11 in.

Louviers, Cement Co., Inc., Louviers, Ky.

630. 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, listing the characteristic values in words to values of specifications. Ill. 8 1/2 x 11 in.

Concrete for Floors. Contains the tentative specifications of the American Concrete Institute for concrete floors of all kinds. Includes moisture condition, types of concrete, testing designs and computing data. 16 pp. Ill. 8 1/2 x 11 in.

CHAIRS—See also Furniture

The Master Chair Co., Bedford, Ohio.

587. Office Chairs, Catalog No. 24. 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, drafting and blueprint chairs, bankers, vaults and offices. 120 pp. Ill. 9 x 12 in.

CHAUS—See also Laundry Equipment


171. Bulletin describing general construction and size of chutes to receive coal. Two types are built into the foundation walls with separate places of the window: another type is placed flush with the ground, and is placed adjacent to wall, can be placed near the street curb. Size 2 1/2 x 11 in. 16 pp.

CLOCKS

Landis Engineering and Manufacturing Co., Waynesboro, Va.

409. Landis Electric Time and Program System. A collection of bulletins No. 110, 110, 120, 130, 150 and 160, dealing with mechanisms, sectional clocks, equipment, time stamps, etc. Bound in expandable filing cover of tough paper. 48 pp. Ill. 8 x 11 in.

COLUMNS

Lally Column Co. of New York, 234 Calyer Street, Brooklyn, N. Y.

122. Lally Column. Handbook. Detailed construction diagrams for various types of steel construction. The text describes the various uses of the columns. Various tests, tables of sizes, cost, and data on other structural materials are given. Size 4 1/2 x 6 in., 81 pages.

CONCRETE, REINFORCED—See also Reinforcing Steel

CONDUCTS—See Pipe


584. Pittsburgh Standard Rigid Conduit. A catalog describing patented thermal protected expansion conduit and conduit fittings, with specifications and useful wiring data. 31 pp. Ill. 8 1/2 x 11 in.

DAMPPROOFING—See also Waterproofing

DOOR BEDS

White Door Bed Co., 150 N. Wells St., Chicago, Ill.

520. Door Bed. Catalog. Booklet containing descriptions and specifications of several types of door bed. 4 pp. Ill. 8 1/2 x 11 in.

DOORS AND WINDOWS

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

558. Complete Catalog for Architects and Builders. Describes various types of hollow metal doors and door frames, and steel doors and frame sash, with sizes, descriptions and prices, 8 pp. Ill. 8 1/2 x 11 in.

Crittall Windows, Crditall Universal Casements, Catalog No. 22. Contains complete description, photographs, specifications, and details of steel casement windows for banks, schools, residences, churches, hospitals, and other buildings, 4 pp. Ill. 8 x 11 in.

Crittall Universal Casement Window Co., Detroit, Mich.

572. Crittall Universal Casements, Catalog No. 22. Contains complete description, specifications, and details of steel casement windows for banks, schools, residences, churches, hospitals, and other auxiliary frames. 76 pp. Ill. 9 x 12 in.

DOLPHIN'S CASTLE, Catalog No. 4. A catalog explaining the advantages of dolphin's castle windows for office buildings, schools, and other buildings. Details of construction specifications and specifications. 20 pp. Ill. 8 1/2 x 11 in.

Dolphin Steel Door Co., Jamestown, N. Y.

574. Architectural Casting. Illustrated catalog showing styles and types of Dolphin's Castle, Standard Casting, Hollow Metal Doors and Trim, Conduit Base, etc. Also various types of frames, jambs, construction and architectural shapes. 178 pp. Ill. 8 1/2 x 11 in., in loose leaf.

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


F-722. Consider the Windows. Bulletin C-162. A finely illustrated booklet showing installations of steel windows in residences, also details and dimensions. 48 pp. Ill. 5 1/2 x 8 in.

H. W. Pomeroy Company, 283 East 147th St., New York, N. Y.

614. Solid Metal Double Hung Window. Type "A." Bulletin A. Complete specifications and details of use, frame, stool and sill, together with weights, capacities, and data on other structural materials are given. Size 11 x 17 in.

Trueson Steel Co., Youngstown, Ohio.

715. Trueson Steel Sash. A catalog containing listing data, tables and weights of Stock Sash installations. 6 pp. Ill. 8 1/2 x 11 in.

459. Trueson Steel Sash. This handbook has been prepared for dealers and specification writers. The descriptions are clear and the specifications complete. 80 pp. Ill. 8 1/2 x 11 in.

438. Daylighting Schools. A treatise on the daylighting and window ventilation of school buildings quoting eminent authorities, illustrated with diagrams of daylight and data of suitable windows. 28 pp. Ill. 8 1/2 x 11 in.

The Wheeler Osgood Co., Tacoma, Wash.

713. Laminos Doors, Catalog No. 21. Doors made of Douglas Fir employing a special laminated and dovetailed design. Twenty designs in vertical and flat grain veneers. Sizes and details. 44 pp. Ill. 8 x 11 in.

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

Von Zie Ventilating Corporation, 250 Madison Ave., New York City.

957. The Ventosator. A catalog describing a metal ventilating panel installed in wood and metal doors. A simple, always sight-proof and can be closed sound-proofed and serves the purpose of a transom. This book fully describes the special features of Doug­ las Fir Laminos 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-25. Venus Pencil in Mechanical Drafting. An interesting illustrated booklet showing the possibilities of the Venus Drafting Pencil for drafting and technical work. 8 1/2 x 11 in.

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

325. Filling 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. Each Dixon colored pencil. 16 pp. Ill. 8 x 4 in. in color chart, Ill. in colors. 3 1/2 x 6 in.


732. Rand Desinator and Specification Card. A diagram of vanishing lines over which perspective sketches can be readily and correctl;' made.

DRAINS—See also Plumbing Equipment

Crompton Farley Brass Co., 221 Mafn St., Kansas City, Mo.

194. Several pamphlets describing various types of floor and area-way drains. 3 1/2 x 6 1/2 in.

DUMB-WAItERS—See also Elevators

Knausen & Heeht Co., 1550 No. Branch St., Chicago, III.


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

40. Hand Power Elevators and Dumb-waiters in Modern Archi­ tecture. Concreted of concrete on concrete. 4 1/2 x 6 1/2 in.

Concrete and Progress

Not only in the shifting skylines of New York and San Francisco, but throughout all this broad land of ours, we see in the making a new and greater American Architecture.

In the development and steady advancement of modern architecture, concrete is naturally playing a conspicuous part. Concrete meets the economic and structural requirements of the twentieth century, and its wide range of adaptability in form and color gives the architect and the sculptor practically unlimited opportunity to express their ideals of beauty.

The booklets, shown above, contain a wealth of practical information on concrete. The list is as follows: "Concrete Data for Architects and Engineers," "Portland Cement Stucco," "A Manual of Concrete Masonry Construction," "Concrete School Houses," "Concrete Hotel, Apartment and Office Buildings," "Mercantile and Industrial Buildings of Concrete."

Let the nearest office listed below know which booklets you want. They will be sent without obligation.

PORTLAND CEMENT ASSOCIATION
A National Organization
to Improve and Extend the Uses of Concrete

Atlanta  Birmingham  Boston  Charlotte, N.C.  Chicago
Dallas  Denver  Des Moines  Detroit  Helena
Indianapolis  Milwaukee  Jacksonville  Kansas City  Los Angeles  Memphis
Minneapolis  New Orleans  New York  Oklahoma City  Pennsylvania
Parksburg  Philadelphia  Pittsburgh  Portland, Oreg.  Salt Lake City
San Francisco  Seattle  St. Louis  Vancouver, B. C.

Our Booklets are sent free only in the United States, Canada and Cuba.

ELECTRICAL EQUIPMENT
Frank Adam Electric Co., St. Louis, Mo.
411. Panel Board Catalog No. 32. A complete catalog of stand­
ard electrical equipment, switches and accessories.
28 pp. Ill. 7x10 in.

Burke Electric Company, Erie, Pa.
562. Bulletin 115, Direct Current Motors and Generators. A
bulletin describing motors and generators developed especially
to meet the most severe requirements and conditions encoun­
tered on mills, foun­
dries, small power plants, office buildings, etc. Ill. 8x10 1/2 in.

Cromie-Hinds Company, Syracuse, N. Y.
1578. Motor Coating Catalogue. A folder describ­ing
these important features of electrical installations in con­
crete.
10 pp. Ill. 5x6 1/2 and
catalog 1056.

The Hurt & Hegeman Mfg. Co., 342 Capitol Ave., Hartford,
Conn.
690. H. & H. Electrical Wiring Devices, Catalog "R". Cata­
log of a complete line of switches, sockets, plugs, receptacles,
plates, receptors, cut-outs and accessories. Two ident­
cical catalogs in two sizes. 104 pp. Ill. 5x6 1/2 and
catalog 1056.

700. Gold and Silver Star Switches. A new type of switch
having a gold star or a silver hemis­

Harvey Hubbard, Inc., Bridgeport, Conn.
297. Electrical Specialist Catalog No. 17. This cata­
log contains descriptions with prices of the thousand and one
items connected with electric light, electric alarm and small electric
appliances installations in modern buildings.
104 pp. Ill. 8x10 1/4 in.

Minneapolis Heat Regulator Co., Minneapolis, Minn.
570. Bulletin 132, Thermostat Relay Switch. Used in con­
nection with any Minneapolis Thermostat, provides a means of
controlling stock, 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. 8 1/4 x 11 in.

481. Liberty Rubber Insulated Wires, Cables and Cords. A
descriptive catalog of insulated wires, cables and cords for elec­
tric current. 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 Elevators Co., 222 W. Vesey St., New York.
169. Photographs and description in detail of elevator equip­
ment manufactured by the A. B. See Electric Elevator Co.
15 pp. Ill. 6x8 1/2 in.

159. Illustrated Catalogue showing elevator equipment for vari­
ous purposes. Cast iron, 23 pp. Ill. 6x9 in.

Kaestner & Heck Co., 1500 N. Branch St., Chicago, Ill.
267. Electric Traction Elevators Bulletin No. 50. Illustra­
ted catalog describing gearless traction elevators and worm-gear
traction elevators. 31 pp. 8% x 11 in.

Kinsbush Bros., Council Bluffs, Iowa.
742 Kinshill Straight Line Drive Elevator, A complete cata­
log of passenger, freight and garage traction elevators, push up
button elevators, dumbwaiters, shaftless and shaft eleva­
tors. 48 pp. Ill. 6x9 in.

Oris Elevator Co., 260 Eleventh Ave., N. Y. C.
651. Otis Graded and Grizzled Traction Elevators. Leaflets de­
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NATIONAL TUBE COMPANY, PITTSBURGH, PA.
DISTRICT SALES OFFICES IN THE LARGER CITIES

PUMPS
The Dayton Pump and Manufacturing Company, Dayton, Ohio.
brochure compiled by engineers and containing illustrated bulletins 81/2 x 11 in. These
bulletins describe pumps as complete automatic electric and gasoline-
water supply systems and all accessories, together with specifications, detail drawings and tables of dimen-
sions. 48 pp.

REFRIGERATION
The Automatic Refrigerating Co., Hartford, Conn.
308. 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. 81/2 x 11 in.

370. Automatic Refrigeration for Retail Markets. A valuable
treatment on the subject matter mentioned in the title. 20 pp. Ill. 81/2 x 11 in.

Baker Ice Machine Co., Inc., Omaha, Nebraska. 601. Baker System Refrigeration. A catalog explaining the
application of refrigeration for hotels, restaurants, institutions and
restaurants requiring up to 50 tons daily capacity including mechanical
details and specifications. 20 pp. Ill. 9 x 12 in.

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. 5 x 7 in.

REFRIGERATORS
Delco-Light Company, Division of General Motors Corp.,
Dayton, Ohio. 510. Frigidaire. Important Facts for Architects and Builders. Frigidaire, the practical refrigerator for houses and apartment
buildings. This book describes the construction, installation and
operation of this convenient refrigerator. 16 pp. Ill. 81/2 x 11 in.

375. 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. Numer-
ous plans showing size and arrangement of refrigerators in kitchens, service and lunch rooms are included. 59 pp. Ill. 81/2 x 11 in.

366. Jewett Solid Porcelain Refrigerators. This improved re-
frigerator is made of one piece solid porcelain ware for both food and ice compartments. Complete line with dimensions, types and prices. 31 pp. Ill. 81/2 x 11 in.

McCray Refrigerator Co., Kendallville, Ind. 672. Refrigerators and Cooling Rooms. Cat. 35. A catalog of cooling
equipment for hotels, restaurants, hospitals, institutions, colleges and clubs. Catalog No. 90 deals with refrigerators
for residences. 55 exx. each. Ill. in colors. 7 x 10 in.

REINFORCING STEEL—See also Concrete, Reinforced
Steel Products Association, Reinforcing Bar Di-
mensions, 4th ed., Mt. Vernon, III.
582. Steel Rail for Concrete Reinforcing. A book describing the manufacturing, fabrication and physical properties of re-
billed, rolled and rail steel bars with specifications for their use. 84 pp. Ill. 81/2 x 11 in.

RESTAURANT EQUIPMENT—See Kitchen Equipment
ROOFING—See also Slate—Metals—Shingles
American Brass Company, Main Office, Waterbury,
Conn. 515. Copper Roofing. Service Sheet. This service sheet con-
tains details for laying copper roofing together with standard specifications. 17 x 22 in. folding to 81/2 x 11 in. printed both sides.

American Sheet & Tin Plate Co., Frick Building, Pitts-
burgh, Pa. 662. Copper—its Effect Upon Steel for Roofing Tins. Describes the methods of manufacturing tinning plates and the advantages of the copper-steel alloy. 28 pp. Ill. 81/2 x 11 in.

364. The Barber Asphalt Company, Land Title Bldg., Phila-
delphia, Pa. 622. Standard Trinidad Built-Up Roofing Specifications. Con-
tains two specifications for applying a built-up roof over boards and two for applying over concrete. Gives quantities of mate-
rials and useful data. 8 pp. 8 x 10 1/2 in. Ask at same time for other Guides for roofers. Ill. 9 x 12 in.

762. Specifications. A pamphlet containing standard specifi-
cations for Genesao Standard Trinidad Lake Asphalt Built-Up Roofing, Genesao Standard Trinidad Lake Asphalt Built-Up Roofing, Genesao Membrane Waterproofing and Genesao Asphalt Flashings illustrated with sketches showing construction. 10 pp. Ill. 8 x 11 1/2 in.

John Boyle & Co., Inc., 112-114 Duane St., New York, N. Y.
212. Boyle's Bayonne Roof and Deck Cloth. List B 81. A
prepared roofing canvas guaranteed watertight on the entire roof and the roofs and floors of piazzas, sun-porches, sleeping porches, etc.
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. 81/2 x 11 in.

The Edwards Manufacturing Company, Cincinnati, Ohio.
355. Single and Spanish Tile of Copper. This book, illus-
trated 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.

Lundawel-Celendan Co., Chicago, Ill.
120. Roofing Tile. A detailed Reference for Architects. Use
Sheets of detailed construction drawings to scale of the sections of various types and dimensions, giving notes of their uses and positions for various conditions of architectural necessity. Size 9 x 13 in. 100 plates.
154. The Roof Beautiful. Booklet. Well illustrated with photo-
tographs and drawings, giving history and origin of roofing tile, and advantages over other forms of roofing. Types shown by detailed illustrations. Size 8 x 10 in. 12 pp.

The Richardson Company, Lockland, Cincinnati, Ohio.
492. V'alhalla Membrane Roofs. Contains specifications for apply-
ing Membrane roof over boards and also for applying over concrete. Illustrated with line drawings of several approved methods of flashings. 3 pp. 8 x 11 in.

Rising and Nelson Siste Company, 101 Park Ave., New
York, N. Y.
496. Tudor Stone Roofs. This leaflet discusses colors and sizes of Tudor hand-wrought slate; deals with the service given to architects and tells how the material is quantified 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. 81/2 x 11 in.

571. Tudor Stone Roofs. A brochure describing the 7 special
grades of Tudor Stone and the tiling performed by this company with illustrations of many structures on which it has been used. 24 pp. Ill. 6 x 9 1/2 in.

Vendor Slate Co., Elston, Pa.
521. Occasional brochures on architecturally pertinent phases of roofing slate sent on request. See also listing under Slate.

ROOF-LIGHTS—See Glass Construction
ROLLING PARTITIONS
J. G. Wilson Corporation, 11 East 27th St., New York
City.
739. Sectionfold and Rolling Partitions and Hygienic School
Waterdrows. Catalog 37. A catalog explaining the use, con-
struction and installation of sectionfold and rolling partitions
also school waterdrows. Describes sizes, dimensions and speci-
fications. 40 pp. Ill. 8 1/2 x 11 in.

SAFETY TREATS
American Abrasive Metals Co., 50 Church St., New York
City.
738. Fiberlon Anti-Slip Treats. Six plates of details of anti-
slip stair treads, door saddles, elevator door and 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. 8 1/2 x 11 in.

SANDBSTONE—See Stone
SASH—See Doors and Windows
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 enameled, galvanized, aluminum, copper, bronze. 30 pp. Ill. 8 1/2 x 9 1/2 in.

The Higgin Manufacturing Co., 5th and Washington
Ave., Newport, Ky.
263. Screen your Home in the Higgin Way. A description of
Higgin doors and window screens with practical data. 10 pp. Ill. 8 1/2 x 11 1/2 in.

New Jersey Wire Cloth Company, 614 South Broad
St., Trenton, N. J.
A booklet telling all about screens, the durability of copper and its appealing over all other methods for screen purposes, 16 pp. Ill. 8 x 7 1/2 in.

May 7, 1924

THE AMERICAN ARCHITECT—THE ARCHITECTURAL REVIEW

37

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SEWAGE DISPOSAL
United Cement Products Co., Indianapolis, Ind.

8416. Health Bulletin on Sewage Disposal. A booklet ex-
plaining the operation of septic tanks with details and lay-
outs. 2 pp. Ill. 6 x 9 in.

SHINGLES—See also Roofing
The Philip Carey Co., Lockland, Cincinnati, Ohio.

2SI. Carey Asphaltate Shingles. Folder containing illustrations
of attractive buildings and residences on which Carey Asphal­
tate Shingles have been used. Describes this type of shingling,
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 Data Book. Complete data of steel
joists giving properties, dimensions, safe loads, coefficients of
deflection, details of connections, specifications, directions for
installations. 22 pp. Ill. 8 1/2 x 11 in.

STONE
The Appalachian Marble Company, Knoxville, Tenn.

503. Appalachian Tennessee Marble. A new booklet on the qualities to be
sought in marble and a treatise on Ten­
Contains also illustrations of the plant of the company, build-
ings in which Appalachian Tennessee Marble has been used and
color plate of six major Appalachian marble slabs. 12 pp. Ill.
8 1/2 x 11 in.

Indiana Limestone Quarriesmen's Assn., P. O. Box 102,
Bedford, Ind.

365. Folders, Series D. Structural detail and data sheets show-
ing methods of detailing cut stone work in connection with
modern building construction. 4 pp. each. 9 1/2 x 11 in.

366. Standard Specifications for Cut Stone Work. This is Vol.
III, Revised Edition of the famous publications on Indiana Limestone,
containing Specifications and Supplementary Data, relating to
best methods of specifying and using this; stone for all build-
ing purposes. This valuable work is not for general distribu-
tion. It can be obtained only from a Field Representative of the
Assn. or through direct request from architect writ-
ten on his letterhead. 54 pp. Ill. 8 1/2 x 11 in.

367. Indiana Limestone Henry, Series B. Vol. 5. A port-
folio containing sixteen designs for small and moderate-sized
buildings of Indiana limestone. A treatise on the prin-
ciples of color design and appropriate technique. 38
pp. Ill. 8 1/2 x 11 in.

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

416. Architectural Granite Int. 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. 8 1/2 x 11 in.

STORE FRONTS.

56. Bronze System of Hollow Metal Store Front Design. Folio of
Detail Sheets. Full size detail sheets 1. 2. 3 and 4. Corn-
er bar, division bar, reverse bar and three-way bar, head tran-
som all and jamb sections. Sheets 18 x 22 1/2 in.

57. Heater System Store Front Construction and Design. Folio of
Detail Sheets. Full size detail sheets 2, 3, 4, 5, 6, 7 and 8 of
hollow metal store front construction, giving full size sections of
head transoms, all and jamb with molding profiles and bar
cover to house awning construction. Sheets 18 x 22 1/2 in.

Detroit Show Case Co., Detroit, Mich.

77. Design. A booklet. Store fronts and display window de-
signs, proportions and elevations, and descriptions. Size 9 x
12 in. 16 pp.

78. Details. Sheets of full size details of "Dasco" awning transom and bar
covers, all and jamb sections, ventilated hollow metal sash and profile of members. Size 16 x
21 1/2 in. 3 sheets.

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

457. Catalog No. 16b. 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. 8 1/2 x 11 in.

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

460. Reliable Anglestone Gas Ranges. A pamphlet illustrating hot plates, laundry stoves and a complete list of gas cooking
ranges equipped with the Lorain Oven Heat Regu-
lator. 8 pp. Ill. 8 1/2 x 11 in.

STUCCO—See also Cement
Portland Cement Association, 147 Madison Ave., N. Y. C.

504. Portland Cement Stucco. Illustrated booklet of recom-
mended practice for Portland Cement Stucco. Contains data on
materials, proportions, application and curing. Table of colors
for various uses, photographs of surface textures and drawings
of construction details also given. 15 pp. Ill. 8 1/2 x 11 in.

STUCCO BASE
The Bishop Manufacturing Company, Cincinnati, Ohio.

501. Biostoric for All Time and Clime. A booklet describing
Bishop paving materials; giving building data, detailed drawings and
specifications. Illustrated with half tone pictures of a variety of
buildings. 32 pp. Ill. 8 1/2 x 11 in.

TELEPHONES
Automatic Electric Co., 245 W. Van Buren St., Chicago,
Ill.

A complete and short specification for the installation of in-
terior telephone systems adapted to all kinds of buildings and
uses. 4 pp. Ill. 8 1/2 x 11 in.

684. The Straight Line. A booklet devoted to interior com-
unication by use of private automatic exchanges and the
P.A.X. Code Calla. Description of a system of intercomunicating telephones.
16 pp. Ill. 8 1/2 x 11 in.

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

A pamphlet giving just the information required for the install-
ation of intercommunicating systems from 2 to 32 stations
capacity. 12 pp. Ill. 7 x 10 in.

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

428. Questions Answered. A brief but full description of At-
tlantic Terra Cotta and its use in buildings. 32 pp. Ill. 8 1/2 x
11 in.

531. Monthly Magazine, Atlantic Terra Cotta. The Apil issue
contains illustrations of English Terra Cotta, 10th Century
and construction details for rusticated stonework. 14 pp.
Ill. 8 1/2 x 11 in.

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

604. Standard Specifications. Contains complete specified
ifications 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. Ill. 8 1/2 x 11 in.

660. Color in Architecture. An illustrated treatise upon the
principles of color design and appropriate technique. 38
pages. Ill. 8 1/2 x 11 in.

697. 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. 8 1/2 x 11 in.

868. Writer Books. Illustrating many banking buildings in
terra cotta with an article on its use in bank design by Alfred
C. Bossom, architect. 32 pp. Ill. 8 1/2 x 11 in.

The Northwestern Terra Cotta Co., 2525 Clybourn Ave.,
Chicago, Ill.

99. Architectural Terra Cotta. A collected set of advertisements in a
book, giving examples of architectural terra cotta, orna-
mental designs and illustrations of examples of facades, of
moving-picture houses, office buildings, shops, ventilation corri-
dors in which Northwestern Terra Cotta was used. Size 8 1/2
11 in. 78 pp.

TILE—ORNAMENTAL
The Associated Tile Manufacturers, Denver Falls, Pa.

284. Home Suggestions. A new book in colors describing and
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garages, for exterior embellishment, etc. Full of suggestions.
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Two RUUD Multi-Coil Storage Systems connected to a thousand gallon tank are located in each station. Later two additional RUUDS were installed for cafeteria usage, making a total of 10 RUUDS that furnish ever-ready, steaming hot water.

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As convenient and satisfying to architects as Ruud Automatic Gas Water Heaters are to clients. A slight pull of the file and the Ruud Architect’s Specification Folder presents all the data necessary for Perfect Hot Water Specifications. Write for your copy. Did you get a Delineator?

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BRANCHES IN ALL LARGE CITIES

RUUD AUTOMATIC GAS WATER HEATERS

Stanley BB 239
5 x 5
Wrought Steel Ball Bearing Butts were used in this building. 3 to a door.

Since 1895
Actual performance is the real test of hardware.
Today after 29 years of continuous operation on
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STANLEY
Ball Bearing Butts
are giving the dependable service for
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Los Angeles Seattle

Architects:
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Buffalo, N. Y.
Why a Master Craftsman Specifies Eagle White Lead Only

GEORGE THOMPSON, of George Thompson, Inc., New York City, uses Eagle White Lead in Oil exclusively.

As an apprentice painter, Mr. Thompson learned his craft forty years ago. For twenty-two years he was associated with Peter McKay, a famous decorator of old New York. From the school of experience he learned the value of craftsmanship in the trade and the value of superior materials for painting.

Since George Thompson, Inc., was organized in 1908 he has held to this standard and specified Eagle White Lead in Oil exclusively. On this basis of quality in materials and craftsmanship in painting George Thompson has built a most successful business. His work consists only of the highest type of interior decorating and the painting of the finest homes in the city. He is busy the year 'round.

"Eagle is the best white lead I have ever used," Mr. Thompson says. This is the master painter's story that is coming more and more frequently to The Eagle-Picher Lead Company, as painters and painting contractors realize more fully the advantages of pure Old Dutch Process White Lead in Oil.

Since 1843 Eagle White Lead in Oil has been pure Old Dutch Process. Should a process of manufacture be discovered that is a better process and not merely a cheaper one for the production of White Lead, The Eagle-Picher Lead Company will consider its adoption. Until that time Eagle White Lead in Oil will continue to be Pure Old Dutch Process, the White Lead in Oil that the painter knows.

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Rust-Proofing Worries Were Ended at This Plant in 1910

For fourteen years the American Spiral Pipe Works has standardized on Sublimed Blue Lead in Oil for all rust-proofing purposes. Exposed to many different conditions, indoors and out, to excessive heat and corrosive gases as well as to the corroding action of the elements, Sublimed Blue Lead in Oil has successfully met every requirement for a rust-inhibitive paint at this plant. Today they say:

"Over a period of more than 14 years, since 1910, Eagle-Picher Sublimed Blue Lead has proven to be the most satisfactory and durable rust-proofing pigment that we have ever used on the various steel structures about our plant, exposed to many different conditions."—American Spiral Pipe Works.

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One hundred pounds of Sublimed Blue Lead in Oil will cover 5216 square feet of iron or steel. This is equivalent to a surface a foot wide and nearly a mile long. It will not harden in the container.

The durability of Sublimed Blue Lead in Oil as a long-time protector of metal surfaces has been proved both in technical tests and in the field.

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Earl Horter’s charming Eldorado drawing, made in November, 1923, is especially interesting because it shows that the war damage has been almost wholly repaired and this classic cathedral restored to its former grandeur.

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GOOD copper screen insect cloth is universally recognized as the best and most economical material that can be used for door, window and porch screens.

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This is not true of Jersey Copper Insect Screen Cloth.

It is made of copper 99.8% pure—the most durable metal in common use—it has stiffness and tensile strength comparable to that of steel cloth. This is due to a special Roebling process which is applied exclusively to the wire used in making Jersey Copper Screen Cloth.

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THE utility of Hubbell Duplex Convenience Outlets is appreciated by any client.

For the duplex outlet makes the use of electric appliances and portable lamps convenient.

Hubbell Convenience Outlets are made in both single and duplex types; side or top-wired.

We would be glad to cooperate with any architect regarding the most advantageous locations for Convenience Outlets in any class of building.

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ELECTRICAL WIRING DEVICES
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Remember it's the Te Slots, that make outlets "Convenient"
Houses become Homes!

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"It's such a comfortable house and so easy to heat"—that's the house with Johns-Manville Housline built into its walls, floors and roof.

Housline is an investment in comfort that actually costs less than nothing. It quickly pays for itself in the coal it saves, because less heat is needed to keep the house comfortably warm.

Of all the materials on the market for insulating building walls, Housline shows the highest efficiency in laboratory tests. It comes in rolls and is very easy to apply under shingles, stucco, or clapboards—as shown in the picture.

Housline is also extensively used as a sound-deadener for floors and partitions.

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Send for this book

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JOHNS-MANVILLE Housline

You’ll find it in specifications written thirty years ago, and you’ll find it today in the latest specifications of those same builders and architects.

The dean of Push Switches, it was “standard” from the start, and three decades of switch-making have had little improvement to offer “Old Reliable”.

New switches have come into the H&H family; fine switches to look upon; costlier switches. But none have replaced “Old Reliable” for quiet, enduring service.

The buttons press with an even tension; there’s no more resistance near the end of the stroke than at the beginning. No jar as the spring acts and the contacts meet.

It’s one place your customer puts his finger on value he can feel! Of all the things in an installation, this one puts the owner in touch with the quality of the job.

Not so high-priced as some switches; not so low as some others. Just in-between—and just the switch for the medium and better-class buildings that concern you most.

In writing for data on “Old Reliable,” ask for catalogue of H&H Switches complete, showing also Convenience Outlets and other devices.

"2081" in your specifications

The Hart & Hegeman Mfg. Co. Hartford, Conn.

The hardware requirements of a modern hotel, where consideration must be given to the security of the guests, the convenience of those who serve, and the protection of the management, are fully met by SARGENT & COMPANY

Heat comfort combined with fuel economy

HOFFMAN "Controlled Heat" is a type of heating that an architect can recommend to his client with absolute confidence. It is adaptable to the simple cottage. It will completely and economically heat the largest office building and do it without the use of mechanical appliances of any kind.

At the touch of the finger the Hoffman No. 7 Modulating Valve instantly controls the amount of heat given off by each separate radiator. Movement of the regulating handle of the feed valve instantly affects a sensitive damper regulator in the basement and the fire is accelerated or retarded to meet the changing demand for steam. This means that coal is not wasted when warmth is not wanted, but that there is always ample heat when it is required.

The Hoffman Differential Loop, no matter whether the boiler pressure is at one ounce or ten pounds, maintains a constant water level and this eliminates the danger of a burned out or cracked boiler. It is a non-mechanical device, utilizing the principle of a balanced water column and cannot fail in its performance.

Stripped of its technicalities, Hoffman "Controlled Heat" is a trouble-free type of vapor-vacuum heating that will provide Heat Comfort and do it economically. It is not expensive to install, it saves fuel and because there are no mechanical appliances to break down or wear out, it operates without expert attention.

Send for our booklet on Hoffman "Controlled Heat."

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OTIS
For more than a half century
The World's Word
for Elevator Safety

OTIS ELEVATOR COMPANY
Offices in all principal cities of the world
This is about the best way to describe

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Pipe. It is not, perhaps, always better than any other pipe made, but it is always good—as good as it is humanly possible to make a product year in and year out. It is the sort of material that you can use without hesitation, feeling that if it does not give service, nothing else will. We can make a million tons of "Youngstown" Pipe a year, and last year did make almost that quantity. We make it from the ore, conducting each and every process. With every facility that is known for the manufacture of pipe, when it is possible to make pipe better than "Youngstown" we shall do so. At this time it is not possible.
Not only are Norton Floors safe, durable and quiet but also adaptable. They are made in forms suitable for every type of building—from the most magnificent hotels and public buildings to industrial plants, railroad and subway stations, and other places subject to rough and unusual service.

There are Alundum Tile and Treads, Alundum Ceramic Mosaic Tile, Alundum Mosaic Treads, Alundum Aggregate Tile and Treads and Alundum Aggregates. Both floor and stair tiles are made in colors to harmonize with any marble or other stone and thus the architect can bring the floor into any decorative scheme.

From among these Norton products it is possible to specify a slip-proof and durable floor that is adapted to the needs of any job.
The Right Roof for Every Building

A sensible roof for any commercial building is governed by the facts in the particular case. Architects are asking these questions:

How does the size of the building affect the roof? Will the building be a permanent unit of the plant or give way to expansion and remodeling?

Is the climate mild or does it run to great extremes of dryness, heat or cold? Will there be vibration from machinery or switching? Is the roof cut by ventilators, etc.? Will the air be charged with destructive gases, vapors, sparks, etc., from enterprises near-by?

When these questions have been answered, the architect can turn to the Carey specifications and find one suited to any given set of conditions.

Asbestos for roofs where asbestos would be most desirable, Feltex felt for conditions where Feltex would be much better, etc.

The results of exhaustive roof research and fifty years of practical experience are embodied in the Carey Specification book. We'll be glad to send it.

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Genasco Standard Trinidad Built-up Roofing is smooth-surfaced—not covered by gravel or slag. It needs no protection from sun, wind or rain.

Genasco Standard Trinidad is built of nature-made, world-old Trinidad Lake Asphalt—not an unseasoned, artificially produced compound.

Genasco Standard Trinidad is reinforced with long-fibred, all-rag felt of great tensile strength—not felt made of paper.

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Through an intake on either side of the boiler, is drawn fresh air, which, without being raised to a high temperature, mixes directly with the fuel gases. A compressed mixture is formed which is instantaneously ignited and bursts into the rear gas chamber as a flame of about 2700° F, when all the smoke particles are changed to colorless Carbon Dioxide.

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Boiler capacities are as follows:
Steam . . . . 2,000 to 17,750 sq. ft.
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On the roof of this bakery, details at important points such as the base and counter-flashings on all walls, decks on the towers, scuttles around vent ducts, and ventilators above elevator hatches are fabricated of "Rome Quality" Sheet Copper.

It is these details that often determine the protective value of a roof—details which are subjected to the constant ravages of time and the elements. But with copper on the job—these details are the strongest and longest-lived part of the roof.

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BRASS COPPER BRONZE
Sheets; rolls; rods; anodes; tubes, brazed and seamless; strips; extruded shapes; angles and channels; tapered tubes and hose pipes; door rail; commutator bars and segments; electrical copper bar; and rivets and burs.

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The construction of the newly erected Field Museum of Natural History at Chicago was really begun way back in antiquity with Nature as the master architect.

Among countless thousands of interesting and instructive specimens on display in this building are skeletons and fossils which Paleontologists recognize as the remains of mammals, reptiles, clams, etc., which existed perhaps even before man. These remains of prehistoric life, seasoned in the vaults of Nature, have also played an important part in the CONSTRUCTION of this building.

From such fossilized clams, or dolomites, and the limestone formation that surrounds them, is made

**Ohio White Finishing Lime**

Being 99 1/2% pure dolomite, having an unusual chemical content and a peculiar natural composition, OHIO WHITE FINISHING LIME produces a permanent, hard, snow-white wall—fire-resistant, metal-preserving and acoustics-improving.

Firm, yet exceedingly “fat” or plastic, it gives maximum coverage with a minimum of both labor and material.

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The **Ohio Hydrate & Supply Co.**
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"The Lime Center of the World"

Some of the fossilized clams from our quarry

Columbus has long since discovered the merits of BRIXMENT

AND in this respect Columbus is typical of many of our more important cities in which BRIXMENT has been used for mortar in structures of exacting requirements—architecturally and structurally.

Adding to the growing list of representative “BRIXMENT jobs”, the builders of the Latham Apartments, Columbus' new, distinctive community of apartment homes, have chosen BRIXMENT for its unquestioned integrity of construction, its economy and its ready adaptability to the desired tone and texture of the bond.

A descriptive self-filing handbook on BRIXMENT will be gladly sent you on request.

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THE beauty of distinctive decoration is emphasized by Vitralite, the Long-Life Enamel. Luxuriously rich in appearance, Vitralite is economical in use. It will withstand wear for years. It will not discolor. It produces a smooth, porcelain-like finish that is easily kept immaculate. Wherever beauty must be combined with unusual service, architects can confidently specify Vitralite in one of the many beautiful tints or white. It may be obtained in either gloss or eggshell finish.

The Pratt & Lambert Architectural Service Department is at your service. Let us help you with your wood-finishing problems.

PRATT & LAMBERT-INC., 98 Tonawanda St., Buffalo, N. Y.
In Canada: 8 Courtwright Street, Bridgeburg, Ontario

PRATT & LAMBERT VARNISH PRODUCTS
Specify—

**Von Duprin**
Self-Releasing Fire Exit Latches
as approved by the Underwriters Laboratories (Inc.) of the National Board of Fire Underwriters.


Better Than Ever

The **Von Duprin** latch of several years ago was a remarkably well designed and carefully made device.

It was, in fact, so well made that no **Von Duprin** device, anywhere, has ever failed to operate in an emergency.

Not content, however, with the practical perfection of the device at that time, we have since made improvements and refinements which put the **Von Duprin** of today in a class of complete superiority to that of a few years ago.

That you may have full information about the latest developments of the device we will, beginning next month, publish a series of advertisements in this magazine giving detailed information about the most interesting improvements embodied in the **Von Duprin** latches now in production.

If you wish this information all at once, ask us for Catalog 24-Q.

For general specification information, see "Sweet's," pages 1415-1419

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Emerson Junior High School, Lakewood, Ohio.
C. W. Hopkinson, Architect.
The Drummond Miller Company, Contractors

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Quality, reflected in the product itself as well as in the installation, is manifest in Dahlstrom Elevator Inclosures.

The test of time has placed its stamp of approval on our work. Let it be your guide.

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LOCAL REPRESENTATIVES IN PRINCIPAL CITIES

Proof that

LAMINEX DOORS

1—Unaffected by water
2—Free from shrinkage
3—Tough and durable

Nine Laminex stock doors were picked at random, as they came from our factory. They were taken to the Forest Products Laboratory, University of Washington, School of Forestry, and there submitted to the most daring tests ever applied to regular-run mill-work. Read this report of the test, made by B. L. Grondal, M. S. F.

Report on tests of doors submitted by the Wheeler, Osgood Company

MATERIAL TESTED:
Nine Laminex stock doors, with built-up rails and stiles and an upper and lower panel of three-ply laminated wood, all of Douglas fir, were furnished by The Wheeler, Osgood Company of Tacoma, Washington, under the following designations:

Nine doors 2' x 6'—15/32". No. 82-V.

METHOD OF TESTING:
Three doors, selected at random, were tested by subjecting the lower panel to a static load applied by means of a 200,000-pound Olsen testing machine until complete failure ensued. The load was applied to the center of the panel by means of a wooden block having a crowned surface two inches by four inches in area in tests upon two doors, while in the test of the third door the load was applied by means of a steel block over an area of one square inch. The moisture content of the blocks at the time of testing averaged 5.2%. Results of the tests follow:

<table>
<thead>
<tr>
<th>Door Number</th>
<th>Load (pounds)</th>
<th>Cause of break</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>725</td>
<td>Splitting of solid wood in center stile.</td>
</tr>
<tr>
<td>2</td>
<td>1097</td>
<td>Breaking of veneer on opposite face.</td>
</tr>
<tr>
<td>3</td>
<td>925</td>
<td>Shearing of veneer by sharp edges of steel block.</td>
</tr>
</tbody>
</table>

In no case did the gluing of the panel or the molding strips holding the panel show sign of failure, and the tests indicate that a door of this type may be expected to withstand very severe usage.

Three doors were finally subjected to very severe drying conditions in a commercial dry kiln, the doors being placed in the kiln and removed by the writer. In this kiln, the doors were subjected to a temperature of 185° Fahr., and a relative humidity of 30 per cent, for a period of twenty-four hours, with the following results:

<table>
<thead>
<tr>
<th>Door Number</th>
<th>Shrinkage cracks</th>
<th>Loss in moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>None</td>
<td>1 lb 0 oz.</td>
</tr>
<tr>
<td>2</td>
<td>None</td>
<td>1 lb 13 oz.</td>
</tr>
<tr>
<td>3</td>
<td>None</td>
<td>1 lb 2 oz.</td>
</tr>
</tbody>
</table>

The above tests indicate very clearly that inside doors of the character submitted for the above tests may be expected to withstand severe usage and that they should give unusually satisfactory service under extreme climatic conditions.

Very truly yours,
B. L. Grondal.

LAMINEX DOORS ARE TRADE-MARKED AND GUARANTEED

All Laminex doors are trade-marked on the top or bottom rail and bear our gold label replacement guarantee. Built in old growth Douglas fir, with vertical grain stiles and rails as well as all-flat grain.

Ask your dealers for Laminex. Write for special monograph.

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Tacoma, Washington, "The Lumber Capital of America"

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LAMINEX DOORS
WILL NOT SHRINK, SWELL OR WARP

It's Easy to Select the RIGHT Lorain-equipped Gas Range

Architects sometimes find their selection of equipment limited because of too few designs. With gas ranges equipped with the Lorain Oven Heat Regulator there are so many styles offered by each of six different makes, that it is an easy matter to select the type of gas range exactly suited for each particular installation—in house, hotel, hospital, church or apartment building.

The annoyance of having to decide upon a certain stove style because the one desired is not made is automatically eliminated. Much valuable time is saved by thus simplifying the selection. Also, there is greater opportunity to choose a model that will exactly suit the builder or owner.

The famous Lorain Oven Heat Regulator, the one with the Red Wheel, is the first perfect application of thermostat control of heat to the oven of the domestic gas range. Lorain insures perfect results in baking and cooking; it eliminates "pot-watching"; it makes possible the cooking of a Whole Meal in the oven at one time while the housewife is miles away; it permits of the canning of fruits in the oven with perfect results; it saves time, labor, food and fuel.

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These famous stoves are equipped with the Lorain Oven Heat Regulator:
- Quick Meal, Reliable, Clark Jewel, Dangler, Direct Action and New Process.

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Smoke and soot are utilized as valuable fuel. This is accomplished by admitting highly heated air at the very heart of the fire, on the Bunsen Burner principle, attaining practically smokeless combustion.

The complete consumption of fuel and ability to burn cheap grades of soft coal makes it possible to reduce heating costs. SUPER-SMOKELESS Boilers have proved unusually successful for oil-burning.

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RAIL STEEL for Greater Strength—Greater Safety—Greater Saving

Rail Steel means better steel because of the high intrinsic quality that was first put into the material when prepared for railroad track service. Rail Steel means safer steel because every foot has already been tested under the most severe strains. It is again inspected, then heated and rolled a second time which gives it greater toughness, finer structure and improved molecular condition. Rail Steel means worth while saving because its cost is distributed over two classes of service. And, further, its use makes for conservation of valuable raw material.

Specify your reinforcing steel to meet A.S.T.M. Specification A-16-14, or equal.

Send for this Valuable Book—
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The first and only authoritative and comprehensive treatise on concrete Reinforcing Bars and containing most important information on the manufacture, qualities, and use of Rail Steel Bars. The cost of this book makes it necessary for us to control its distribution and we ask that your request for a copy be sent us on the letterhead of an architectural or engineering firm.

Write the nearest office.

RAIL STEEL for REINFORCING

A CHARMING brick composition in which the plastic nature of brick construction is evident. The projecting coping of the gable, resting on corbeled shoulders, the round window, and the chimney tops, show how easily brick fit into the architect's design. In "Architectural Details in Brickwork" you will find many other examples of artistic brickwork in which only standard brick are used. The halftone plates, issued in three series, each in an enclosed folder ready for filing, will be sent to any architect requesting them on his office stationery. Address, American Face Brick Association, 1754 Peoples Life Building, Chicago, Illinois.
$50,000 Prize Design for Tribune Tower to be Created in Indiana Limestone

On its seventy-fifth birthday anniversary in June, 1922, The Chicago Tribune resolved to provide a new and beautiful home worthy of this great newspaper, which had advanced from a room over a grocery to a gigantic publishing plant.

It announced the greatest architectural contest of history. One hundred thousand dollars in prizes were offered to architects. The competition was open to the world. The architectural ideas of twenty-three countries were drawn into the contest and two hundred sixty designs were received.

The design submitted by John Mead Howells and Raymond M. Hood, Associate Architects, New York City, was given first prize of $50,000 by the Jury of Award.

Dr. Emerson Swift, University of Chicago, stated: "The Tribune Tower is an epoch making building. It represents the highest development of the office building type in the world. It is the building of the decade and perhaps of the century."

The owners' high resolve "to adorn with a monument of enduring beauty this city in which the Tribune has prospered so amazingly" is evidenced in their selection of Indiana Limestone for its construction.

Our handsomely illustrated booklets on Indiana Limestone will be sent free upon request.

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<td>Van Zile Ventilator Corp</td>
<td>99</td>
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<tr>
<td>Vender slate Co</td>
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<tr>
<td>Vitrolite Co</td>
<td>86</td>
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<tr>
<td>Vomagott Hardware Co</td>
<td>74</td>
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<tr>
<td>Wall Paper Mfrs. Ass'n of the U. S.</td>
<td>19</td>
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<tr>
<td>Wayne Tank &amp; Mfg. Co</td>
<td>19</td>
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<tr>
<td>Welch-Mignon Co</td>
<td>79</td>
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<tr>
<td>Wellingshame Electric &amp; Mfg. Co</td>
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<td>Wheeler, Osborn Co.</td>
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<td>Wilson, The</td>
<td>79</td>
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<tr>
<td>Weykoff, A. &amp; Son Co</td>
<td>88</td>
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<tr>
<td>Yale School of Fine Arts</td>
<td>102</td>
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<tr>
<td>Youngstown Sheet &amp; Tube Co</td>
<td>65</td>
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