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3. Standard hardware is solid bronze.

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The Texas reputation for doing everything in a big way is upheld by the new $20,000,000 "McCarthy Center" project, of which the Shamrock Hotel opening March 17 is a part. The fact that the job is being done in the best way is suggested by the specifications, which include wrought iron in eleven different services. Drainage lines, downspouts, fire lines, condenser water lines, condensate returns, exhaust lines, hot and cold water lines over 3 inches, chilled water lines over 3 inches, air lines, and swimming pool piping, are Byers Wrought Iron pipe, in sizes from % to 20-inch.

Every one of these services carries a corrosive threat—and every one represents a time-tried wrought iron application. Surveys of old buildings, made in a number of areas, have shown wrought iron pipe still serving in heating and plumbing lines after periods of 40 to 50 years. The same surveys revealed many cases where pipe made of low-first-cost materials in newer buildings had failed in a fraction of that time.

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Our bulletin, "Wrought Iron for Piping Systems" gives a digest of the experience of designers with wrought iron in building services. Ask for a complimentary copy.


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ARCHITECTURAL RECORD

Vol. 105 • No. 3

March 1949

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COVER: Quadrangle, Uxmal, Yucatan; Hedrich photo

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True to predictions, the Administration lost no time in applying the pressure to its own anti-inflation and housing programs once Congress settled down to work in the 81st session. Inauguration seemed to mark the starting date. A week after President Truman took the oath of office Congress had before it half a dozen major housing bills and both of the Banking Committees had approved a seven-months extension of voluntary allocations of scarce materials beyond March 1.

Democratic leaders announced they would try to get through Congress stand-by powers for the President to impose compulsory price, wage and allocation controls—part of the much-heralded anti-inflation pattern. All emphasis seemed to be on stepping up the legislative tempo, and bills having to do with rent controls, housing, export controls and allocations all were caught in this sudden draft of pressure.

(About the same time came the announcement that the Administration was readying a bill to create a Columbia River Authority, seen as further evidence of an all-embracing effort to revamp and “strengthen” laws having to do with construction matters.)

**Party Cleavages Closing Up**

Observers watched the party cleavages slip away in the first significant test of power in the House; 49 Republicans had voted with the Democrats to liberalize the House Rules Committee, the body that bottled up the housing bill in the 80th Congress. With that obstacle removed, the 81st Congress is generally expected to enact a comprehensive measure aimed at freer government financing guarantees and including the construction of public housing units. Builders favor the former provision, oppose the latter.

Further evidencing an area of inter-party agreement on the broad housing issues, Senator Robert Taft’s followers and Administration supporters ignored differences long enough to agree on the fundamental methods of attacking the housing shortage legislatively.

### Housing Bills Much Alike

When the bills of both parties had been unmasked, they were found to be remarkably alike in principle, differing essentially in the following points: the number of public housing units to be constructed, amount of capital grant outlays, and tax exemption for local bonds. Other points of difference noted: rate of construction of public housing units, length of program, and amortization period. The Administration and Republican bills approached the problem of home shortages along parallel lines in respect to slum clearance, farm housing, research and changes in Federal Housing Administration operations.

Summed up, both major parties jumped in to foster comprehensive housing measures, the Republicans making a somewhat softer approach toward the same end.

Banking Committees of both houses of Congress worked over the rent and housing proposal concurrently. A Senate Banking Subcommittee, under Sparkman of Alabama, started hearings on the housing bills almost immediately—early in February—while the House Committee rushed its consideration of extending rent controls, in strengthened form, for two years beyond March 31. The agreement was for each of the committees to take up the other subject when it had finished with its initial hearing. This was arranged in an effort to get the bills on the floor as soon as possible.

Throughout the legislation proposed runs an emphasis on more housing at lower sales and rental figures. Stressing this phase particularly is the Administration’s own suggestion for amending the National Housing Act. This was introduced by the Banking Committee chairman, Senator Maybank of South Carolina, and Rep. Spence of Kentucky, clearly marking it for committee support. Dealing with the mortgage insurance programs and the secondary market program, it would, in brief:

1. Provide direct loans to veterans’ housing cooperatives if private lending institutions failed to do the job. This is an entirely new proposal.
2. Exempt cooperatives, rental housing projects and low-cost homes built for sale from the present 50 per cent limitation on the amount of loans which the Federal National Mortgage Association can buy from any one mortgagee. This would have the effect of permitting the federal government to purchase without limit mortgages on low-priced housing.
3. Continue government insurance up to 90 per cent of 40-year, 4 per cent interest loans on nonprofit cooperative

(Continued on page 10)
The use of Asphalt Tile in Modern Multiple Housing Projects

By Edwin H. Mittelbusher, Architect

The design of a rental housing project is secondary only to the financing pattern. The selection of each and every detail of construction, and the selection of each and every material is influenced thereby. The physical security for long term loans, by that I mean 27 to 32 year loans, must fulfill certain fundamental requisites and standards, some of which are dictated to us by the lenders, others by the myriad of building ordinance, and still others imposed upon us by the future tenants themselves.

We arrive, eventually then, at an area or range within which we must design. It is necessary, in order to obtain a fair return, that both construction, operating, and maintenance costs be consistent with the rental income expectancy. The fullest possible advantage must be taken of all the factors involved.

In the 366 unit rental project now under construction in LaGrange Park, there is about 360,000 square feet of floor area or surface (not including basement laundry, storage and boiler room area).

These floors consist of a 21/8" concrete slab poured in place over light weight steel beams. The choice of a floor covering for these concrete floors received our utmost attention for many months.

We are faced primarily with a maintenance problem. In addition to that, we were concerned with the original cost of installation or first cost.

In this project there are 32 garden type apartments, in which the floors are about 2'-0" below grade. A floor material, such as asphalt tile, which resists moisture is required in these units.

Then last but not least in importance was the matter of floor color and its effect on the apartment color scheme. With these four basic and fundamental requirements in mind, we selected asphalt tile as the material which would best fulfill and satisfy every one of these standards and many more.

**MAINTENANCE**

Plain soap and water mopping clean it easily. The dirt is never absorbed into the material itself but stays on the surface where it is easy to remove. An occasional waxing will bring out the rich colors although this is not necessary. We chose Greaseproof Asphalt Tile for the ground floor.
kitchens because it is grease proof, very seldom stains, and resists the passage of moisture. Replacement of tile is comparatively simple if unforeseen damage should occur in certain areas.

LOW FIRST COST

Asphalt Tile flooring is one of the lowest cost floor coverings available. The preparation of the surface for the concrete sub-floor is a very simple operation consisting only of troweling the concrete slabs to a smooth level surface in preparation for the mastic adhesive. The individual tiles can then be rapidly set in place, cleaned and ready for use immediately thereafter. Apartments are ready for occupancy in a matter of a few hours.

COLOR

We have selected a marbleized deep brown color for the living rooms and bedrooms, and a very light gray for the kitchen floors to harmonize with the cabinets and counter-tops. These floors will blend in with the driftwood finish of the mill-work and the aluminum sash. These color schemes, being somewhat neutral, will give the tenants the maximum utility as well as the least problem insofar as blending in with their present or new furniture, rugs, draperies, etc., is concerned. These are very real considerations which definitely affect rentability and in our experience we have found that asphalt tile has received the general acclaim and acceptance required of floor coverings in this type of dwelling unit.

LONG WEAR AND LONG LIFE

When the matter of long life was given our attention, we examined asphalt tile floors that had been subjected to hard wear and traffic in stores and corridors for at least fifteen years. Upon close examination we came to the conclusion that this type of floor was practically "wear-proof."

RESILIENCY AND COMFORT

Figures indicate that the average housewife walks 25 miles per year making beds. This means that unless the floor is extremely resilient and comfortable, she wouldn't have enough energy left to complete the remaining household duties required of her. Asphalt tile is unusually resilient and less fatiguing than other type of floors. It is quiet as well, and provides a certain amount of sound-proofing, which is an important consideration in housing projects.
ownership housing projects but increase from 95 per cent to 100 per cent the insurance of such loans where at least 80 per cent of the members of the cooperative concerned are veterans of World War II. (Maximum amount of the mortgage in the case of the 90 per cent loan would remain at $8100 per family dwelling, or $1800 per room. In the case of the 100 per cent loan, maximum amount of the mortgage would be $9000 per family dwelling or $2000 per room. In all these instances the insurance would be based on current replacement costs.

4. Increase the total insurance authorization under Title II of the present Act by $1 billion. Use of the fund would require approval of the President.

It is obvious that this piece of legislation, drawn under the guidance of Raymond M. Foley, Housing and Home Finance Agency administrator, would greatly liberalize the use of government credit for financing and the construction of lower cost homes.

(Continued on page 12)

CONSTRUCTION OF MEDICAL CENTER TO START SOON

Details of new definitive architectural plans for the new University section of the New York University-Bellevue Medical Center, announced in mid-January, indicate a total cost of about $32,744,000 for the University's share of the Center. The plans now call for facilities for two medical schools, a 600-bed University Hospital designed primarily to serve patients in the middle-income brackets, and related clinics. Architects for the project are Skidmore, Owings & Merrill of New York. Construction is expected to begin this spring.

NEWS FROM CANADA

By John Caulfield Smith

Stone and frame house (plans below) now under construction in Port Credit, Ont., 10 miles from Toronto, for Mr. and Mrs. T. C. Hewson. Designed by E. C. S. Cox, Architect, it faces south, overlooks a golf course, and combines one and two story height

(News continued on page 146)
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Lower Cost Homes Materializing

Meanwhile the National Association of Home Builders is pointing with pride to the success of its efforts to increase the number of lower-cost homes being built. Of more than one million units of all types added to the housing supply in 1948, N.A.H.B. reports, thousands were of the Economy House variety and sold for $4500 to $8500. Two of every five homes purchased last year were bought by families with income of less than $3000, and four out of five by families with incomes under $5000. Eighty per cent of all houses sold went for less than $10,000 while the average purchase price paid by veterans for houses, old and new, was $7600.

N.A.H.B. is proud of these figures, contending that home builders — private home builders — are meeting the needs of relatively low-income families.

Agencies of government, incidentally, have been speeding up their plans to bring down the cost of home construction. A meeting of those concerned with the HHFA drive — officials of both government and industry groups — was held in January and field sessions aimed at taking the gospel of economic home building to the men who handle actual construction details, to the architect, the contractor, supplier, etc., began on February 8. An effort will be made to hold similar meetings in every city in the country of 10,000 population or over. The U.S. Chamber of Commerce is cooperating and local FHA officials are handling details of the conclaves.

Housing Research Programmed

New attention also is being given to research on housing. A significant move in this field is the recent appointment of Joseph H. Orendorff as Director of Design and Methods in HHFA’s Division of Standardized Building Codes and Materials. Mr. Orendorff had temporarily handled administration of management and disposition policies for the war-built Lanham Act housing and now returns to the Division to supervise the development of modular construction research involving standardized dimensions for building materials. This is certain to be an expanding activity under present agency plans. The Housing Act of 1948 authorized the HHFA to create the Division for advancing adop-

(Continued on page 14)
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*Based on room size 15' x 15'

The Record Reports
(Continued from page 12)

tion of standardized building codes and standardized dimensions and methods. Officials expect this work to increase its strides immeasurably under legislation now before Congress.

A few weeks ago Mr. Foley announced the completion of arrangements, involving the signing of a $10,000 contract, whereby the National Research Council will act in an advisory capacity to the Division's research program on building techniques. National Council committees are composed of leading scientists and engineers from industry, educational and nonprofit organizations. Therefore this bridges the gap more effectively between government and industry research.

Making the announcement of the contract, Mr. Foley said: "Greater use of standardized parts, and improved methods of building are constructive policies, adoption of which would help in the solution of the problem of costs in the house building industry."

BRAB Pulse Is Quickened

Closer coordination of all research in construction was promised when members of the Building Research Advisory Board met in Washington in mid-February. This meeting breathed new life into the organization. BRAB was first thought of in the fall of 1946, was organized then and has been growing slowly since that time. The Board is a group of industry and government people interested in coordinating and advancing the research idea. It seeks eventually to get cooperation from all layers of industry, from the producers of building materials who now may be carrying on their own research projects in isolated and unknown instances. Bringing together information of these research activities, and making their benefits available to the construction industry as a whole, can go a long way toward improving building techniques — and lowering costs at the same time.

That is the aim. It is emphasized that BRAB intends to do no researching itself. The general chairman is Dr. Frank B. Jewett, a former president of the National Academy of Sciences. His executive committee is composed of Walter A. Taylor, director of research and education for the American Institute of Architects; Harry C. Plummer,
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THE RECORD REPORTS

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director of engineering and research for the Structural Clay Products Institute; Dr. C. F. Rassweiler, vice president in charge of research development for Johns-Manville Corp.; W. E. Reynolds, commissioner of the Public Buildings Administration; and Prof. William H. Scheick, coordinator of the Small Homes Council at the University of Illinois.

The form that BRAB activities will take from now on was more clearly defined at the Washington session. It may take its future operative clue from the National Highway Research Board, a group that has grown in 25 years to be a most valuable implementation instrument serving the highway industry. It is realized that the functions of the building industry are much different and in themselves diversified, but BRAB will grow into such an implementing body.

VA Hospital Program Cut

The architectural profession, along with all other segments of the building industry, was surprised by the President's sudden decision to cut back the Veterans Administration hospital construction program rather drastically. Mr. Truman revealed without previous indication that he had ordered the program slashed to the extent of 16,000 beds, both temporary and emergency types. Several firms throughout the country were caught in the midst of preparing plans and specifications for those hospitals struck from the list.

VA said the proposed construction of 24 new hospitals and reduction of the size of 14 others were involved in the mandate.

Repercussions are expected in Congress before the appropriation bills are passed. While Administrator Carl R. Gray, Jr., of the veterans' agency announced that the curtailed building program would not deny hospitalization to any service-connected veteran, the protest pressure on congressmen from their constituents is severe.

Veterans' organizations were quick to announce their opposition to the decision. The American Legion expressed this attitude when it announced: "At a time when there are two million veterans of both World Wars being compensated for service-incurred and aggra-
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THE RECORD REPORTS

(Continued from page 16)

vated disabilities, when thousands of new claims are pending adjudication, and when nearly 15,000 veterans are awaiting hospital admission, we will strenuously fight curtailment of the VA hospital construction program."

(Note: VA itself estimates that the amount lost through the cutback order was nearly $10 million. That is, $1.4 million in site acquisition expenditures, and between $7 million and $8 million spent on all technical services including preparation of plans and specifications. The decision to reduce, of course, will result in an immense saving in construction costs otherwise charged to the VA program. Administrator Gray estimated this at $280 million.)

The Administration had one argument

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ELIOT CROSS


Mr. Cross was a practicing architect in New York for 40 years. He and his brother, John W. Cross, founded the architectural firm of Cross & Cross in 1907, and designed some of New York City's best-known buildings, among them the Hotel Barclay, Doctors Hospital, the Postum Building, the Harriman Building, and the new Tiffany & Company building on Fifth Avenue at 57th Street. The firm was dissolved in 1942.

In 1922 Mr. Cross, with P. Seward Webb and the late Robert C. Knapp, founded Webb & Knapp, serving as chairman of the firm's board of directors from its founding until 1947 when ill health forced him to retire.

HENRY E. RICHARDS

Henry E. Richards, alumnus of Harvard University with the class of 1869 and of Massachusetts Institute of Technology with the class of 1871, died at his home in Gardiner, Me., on January 26 at the age of 100.

An architect by profession, Mr. Richards practiced in Boston for seven years following his graduation from M.I.T., and then moved to Gardiner, where he was for many years head of the Richards Paper Company.
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THE RECORD REPORTS

(Continued from page 18)

for its decision: the saving on steel to result from cancellation of $280 million worth of heavy construction. The rift between the White House and steel producers over additional capacity, how much should be built and by whom, was growing in extent as the President pressed for power to put the federal government in a position to build steel plants should industry fail to take advantage of federal loans he proposed to extend for the purpose.

The publicly-announced reason for the reduction in the hospital construction program was this — re-evaluation since the end of the war has shown that estimated needs for hospital beds were "considerably larger than actually has proven necessary." Sixty-four individual projects not under contract at the time were surveyed in reaching the decision to drop 24 entirely and reduce 14 others.

The announcement came at a time when production prospects for most building materials, excluding steel and aluminum, are better than at any other time since the end of the war. The Producers' Council is confident that there will be an adequate supply to satisfy the volume of construction of all types anticipated in 1949.

Iron and steel companies spent $583 million in 1948 to expand and improve production facilities. The figure will increase to $627 million in 1949. Some producers have ventured the opinion that the 1949 requirements might actually be met in all major fields with the exception of transportation.

Federal Grants Promised Building

Large amounts of money in the form of federal grants are included in building construction bills introduced in the 81st Congress. The large scale federal aid to education bill which lost out in the last session and is being pushed again now, does not contain specific funds for building purposes. This fact has brought out a number of suggestions for direct federal grants to be used in school building construction alone. Foremost among these is the House bill authored by Rep. Joseph W. Martin, Jr., former GOP House Speaker. It would commit the government to an annual outlay of $300 million over a three-year period and require state and local governments to match the

(Continued on page 22)
Here's a new, greatly superior window that becomes an integral part of your glass brick construction. It's so versatile that you can use it in any type commercial or institutional building... so adaptable that it fits any space, large or small, you are likely to require... so strong and rigid that it can provide its own lintel under the glass blocks. It gives you vision — or ventilation — or both... with single pane or insulated glazing. Designed for use with Light Directional Glass Block. Constructed of high-tensile strength extruded aluminum alloy, it does away forever with maintenance costs... waterproof, weatherproof for life.

**RIBBON TYPE**

No structural lintel required... All-aluminum construction... Completely fabricated at factory—eliminating assembly of mullions and covers... Protected type ventilation.

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All-aluminum construction... Completely weatherproof and waterproof... Glass block in each integral in one frame... Easy access for cleaning block and sash.
In this attractive, modern plant, its mullions by Alberene—because Alberene mullions match so well the shadow effect of the windows... blend so perfectly with the exterior of the building as a whole.

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The new Series 500 Nesbitt Syncretizer is also today's most beautiful unit ventilator. It may be installed independently or as a unit of The Nesbitt Package with Storage Cabinets (and Convector when desired). Ask for Publication 258. Made and sold by John J. Nesbitt, Inc., Philadelphia 36, Pa., and sold also by American Blower Corporation.
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For information on the complete Luria line, send for your copy of our new 20-page catalog, A.I.A. FILE 14-i.
The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926-29 for that particular type — considered 100.

Cost comparisons, as percentage differences for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.: index for city A = 110
index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

\[
\frac{110-95}{95} = 0.158
\]

Conversely: costs in B are approximately 14 per cent lower than in A.

\[
\frac{110-95}{110} = 0.136
\]

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926-29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.

These index numbers will appear whenever changes are significant.
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MARCH 1949
REQUIRED READING

LE CORBUSIER AGAIN
Concerning Town Planning, By Le Corbusier. Translated by Clive Entwistle. The Yale University Press (New Haven, Conn.), 1948. 5% by 8½ in. 128 pp., illus. $2.75.

The publishers of this first English translation of Le Corbusier's "propos d'urbanisme" call it that indefatigable and prolific author's "most important postwar book," and perhaps it is. Certainly it is one of his most interesting, packed full of typical Le Corbusier-isms and drawings.

"Towns are born, and grow throughout the ages; they deform under the assaults of life." From that introductory sentence all the way through to the final conclusion reached, this is a volume carefully calculated to stimulate and intrigue the imagination of its reader. It takes the form of replies to a series of 18 questions put to Le Corbusier in 1944 by an English source, and it takes the opportunity once again to expound the philosophies of town planning which for years have been synonymous with the name of their author.

CITY PLANNING

Subtitled "A Modern Treatment Based on the Planning of the Modern City by Nelson P. Lewis," these two volumes are inherently a revised edition of the text first published in 1916, but the revision has been so extensive that the present work ranks as a new publication. Its author is the son of Nelson P. Lewis, author of the original volume.

Following several introductory chapters defining city planning and describing its goals, Volume I of the present edition plunges into such subjects as population distribution and trends, land surveys, zoning, transportation, development of shopping centers. Planning trends both here and abroad are discussed, and the mechanics of planning are thoroughly described. Volume II takes up neighborhood and community planning, housing, redevelopment of blighted areas, and special planning problems such as airport location, parking and decentralization of industry. A final section is devoted to legal, economic and administrative problems. Maps, diagrams, photos and drawings abound throughout both volumes.

Arranged as it is with questions and reference lists at the end of each chapter, the book is ideally suited for classroom use as well as for independent study.

Mr. Lewis has adhered closely to the planning principles laid down by his father, but has replaced references, brought statistics up to date, and added new chapters and much new material. The result is a book which very likely will be a standard text for some time.

NEIGHBORHOOD STANDARDS
Planning the Neighborhood. By the American Public Health Association Committee on the Hygiene of Housing. Public Administration Service (1313 E. 66th St., Chicago 7, Ill.), 1948. 7½ by 10½ in. viii + 90 pp. $2.50.

Based upon the authority, standards and findings of the American Public Health Association Committee on the Hygiene of Housing, PLANNING THE NEIGHBORHOOD is concerned with criteria for the environment of residential areas — with the physical setting in which homes should be located. It includes basic health standards which may direct the planning of the residential neighborhood, and the Committee's recommendations for the selection and development of sites.

Intended to reach several groups (personnel of planning and zoning boards, architects, builders, producers of building materials, government building program authorities, etc.), this brief volume is admittedly not a manual of design, but "a formulation of those principles and standards which the technician will use in combinations to be determined by him in the course of his design solutions."

ARCHITECTURAL SANITATION

In this highly technical book, written primarily for the public health engineer, the architect will find much information not readily available to him elsewhere. For instance, there is a detailed chapter on the air supply of enclosed places, which includes such items as air pollution by human occupancy and the effect of industrial operations. Another chapter deals with heating, ventilation and air conditioning needs and practice, and another with lighting. Still others treat sewage disposal, swimming pool requirements, and rural sanitation.

ARCHITECTONICS IN RHYME
Geo-metric Verse. By Gerald Lynton Kaufman. The Beechhurst Press (256 Broadway, New York 7), 1949. 5 by 9½ in. 64 pp., illus. $1.50.

"Poetry forms in mathematics
Written mostly for fanatics" — Squarely or Ellipsometr?
Kaufman waxes glib upon it!
Dactyllic Frustum, Short Pantoum
Dissipate the darkest gloom.
If your sense of humor's failing
Converse will ease the ailing,
While Cubicouplets or Convextasy
Obviate neuro-perplexet,
Growl because you have a headache?
Kaufman's cure will be an earthquake
To shake your ills
But quick: no pills.
For there's indeed no whim pedantic
In this volume's gyro-antic.
Let's give a rousing cheer, I say,
For Mr. Kaufman, A.I.A.!

LATIN AMERICAN ART

Architects participating in the tour to Mexico following the A.I.A. Convention in Houston this month will welcome this extensive bibliography listing some 5000 books and articles on the art of the 20 Latin American republics and Puerto Rico.

The bibliography is divided into three chronological periods: the Colonial Period, the 19th Century, and the Contemporary Period. A preliminary section lists general works covering the whole field, and texts dealing with two or more periods. For each period there are three preliminary groupings: Latin America,
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REQUIRED READING

(Continued from page 28)

South America, Central America and the West Indies. These are followed by sections for each country, subdivided into subjects such as architecture, graphic arts, painting, sculpture, and so on. This simple pattern makes it easy to find exactly the kind of reference desired.

HOSPITALS

The Hospital Building: Seminar Addresses at the 1947 A.I.A. Convention. Compiled and Edited by Walter A. Taylor. The American Institute of Architects (The Octagon, Washington 6, D. C.), 1948. 8½ by 11 in. 72 pp., illus. To members of the A.I.A., $1.00; to non-members, $2.00.

In answer to repeated demands, the lectures given at the Hospital Seminars at the 1947 A.I.A. Convention have now been compiled in book form, supplemented by a comprehensive bibliography for the subjects covered and additional data and notes reprinted from the A.I.A. Bulletin. The result is a compact volume which no architect interested in hospital construction can afford to miss.

Subjects covered include: Administrative Aspects of Hospital Design; Programming for Hospital Design; Schematic Plans for Hospitals (with diagrams); The Elements of the Hospital; Hospital Construction, Detailing, Finishes, and Equipment. Authors include some of the foremost hospital architects and medical authorities in the country.

IDEAS FOR THE HOME


This new edition of Mrs. Rutt's basic text on home furnishing contains much material not included in the earlier edition, noticeably the entirely new chapters on landscaping, house planning, and exterior house design.

The book was written as a textbook for classes in home planning and furnishing as well as a general guide for homemakers and interior decorators. It is, therefore, both simply written and greatly detailed. Even so, architects may well find it interesting per se, and certainly will want to be familiar with it for the sake of their clients, many of whom are likely to have studied it assiduously.

The book is lavishly illustrated, and covers its subject all the way from foundations to flower arrangements.
to cap a monument
eternal or a
built-up roof:

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Here's how government tests at U. S. Forest Products laboratory rank the relative strength and rigidity of various sheathing materials on walls with openings:

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<th>Sheathing Material</th>
<th>Relative Rigidity</th>
<th>Relative Strength</th>
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<td>1%8&quot; DIAGONAL SHEATHING</td>
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<td>1.3</td>
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<td>29/32&quot; FIBERBOARD</td>
<td>1.6</td>
<td>2.1</td>
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<td>HORIZONTAL with LET-IN BRACES</td>
<td>1.5</td>
<td>2.2</td>
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<td>1/4&quot; PLYWOOD NAILED</td>
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<td>2.8</td>
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<td>1/4&quot; PLYWOOD GLUED TO FRAME</td>
<td>3.7</td>
<td>4.0</td>
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SEE SWEET'S CATALOG for uses, advantages and specifications of these other ARMCO Special-Purpose Steels.

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BIGELOW Rugs and Carpets

*Beauty you can see... quality you can trust... since 1825*
Try to imagine the drawing instrument of 2049...

It may be a pencil made of a substance not yet dreamed of or a stylus filled with electronic tubes. Perhaps it will emboss lines automatically so prints can be pressure-molded in seconds. Yet one thing will remain unchanged:

The finest drawing-writing materials will still bear the name

EBERHARD FABER

The golden nugget means more than the fact that the Eberhard Faber Pencil Company was founded in the year of the great California Gold Rush. It is symbolic of the enduring respect age brings a name...a good reputation is truly golden.

ENTERING OUR SECOND CENTURY OF LEADERSHIP

MARCH 1949
DUPLEX RECEPTACLES

Complete Line for General Installations

No. 9260 — the new Back-Wired Duplex Convenience Outlet — can be side-wired too but the back-wiring feature makes easier, more secure installation. Built-in stripping guide assures correct stripping, eliminates exposed wire. Individual terminal clamps hold wires with a no-slip grip. Strong plastic base (No. 9260, brown; No. 9260-I, white Ivorylite), with double T-slots. Double side-contacts with large recessed binding screws ample for No. 10 wire; washer-type plaster ears. Altogether a new "high" in receptacles.

No. 1913-I — Duplex Convenience Outlet of white Ivorylite, with 4 binding screws for side-wiring only. T-slots and wide plaster ears. Long-proved a most dependable receptacle for high-grade residential wiring. (For brown plastic base, specify No. 1913.)

No. 400-I — New intermediate-grade Convenience Outlet, sturdily built, entirely encased in molded white Ivorylite. Double side-contacts with 4 contact screws ample for No. 10 wire. Parallel slots with guiding grooves for easy plug insertion; wide plaster ears. Meets REA and Federal specifications. (For brown plastic base, specify No. 400.)

No. 401 — Same receptacle body as No. 400 but furnished with metal outlet box cover for 3½" or 4" boxes for basement work, private garages etc.

DISTRIBUTED THROUGH ELECTRICAL WHOLESALERS

HART & HEGEMAN DIVISION

THE ARROW-HART & HEGEMAN ELECTRIC COMPANY, HARTFORD 6, CONN., U.S.A.
Expediency May Invite Premature Obsolescence in a Toilet Room Environment

Sanymetal Century Type Ceiling Hung Toilet Compartments are particularly appropriate for schools. They impart dignity, refinement, and cheerfulness to the toilet room environment.

Sanymetal Porcena Academy Type Toilet Compartments are particularly appropriate for schools. They impart dignity, refinement, and cheerfulness to the toilet room environment.

- Toilet compartments usually dominate the toilet room, influencing the environment of the one room that is important to everyone occupying the building. Toilet compartments sometimes become outmoded quickly by changes in design and materials. Sanymetal "PORCENA" (Porcelain on Steel) Toilet Compartments provide a generous measure of protection against premature obsolescence because of their modernity and beauty, fadeless color combinations, utmost sanitation, and a correct combination of the hardness of glass with the structural strength of steel, which assures years more of unvarying service.

Fabricated of the ageless, fadeless material—"PORCENA" (Porcelain on Steel)—Sanymetal "PORCENA" Toilet Compartments are available in a wide range of beautiful, never-fade colors imbedded deep into a glass-smooth, flint-hard, non-porous surface that is moisture and rust-proof, does not absorb odors, and is impervious to ordinary acids, oils and grease. The glistening porcelain finish discourages defacement; is easily cleaned, and the brilliance of the surface renewed by wiping with a damp cloth.

Ask the Sanymetal Representative in your vicinity (see "Partitions" in phone book) for helpful suggestions on planning modern toilet room environments. Refer to Sanymetal Catalog 21-B6 in Sweet's Architectural File for 1949 or write for file copy of Catalog 86.

THE SANYMETAL PRODUCTS COMPANY, INC.
1689 URBANA ROAD • CLEVELAND 12, OHIO

Sanymetal Catalog 86 illustrates several typical toilet room environments as well as shower stalls and dressing room suggestions.
Whatever the type of building...

Whatever its window requirements...

You can build for distinction and keep costs low by specifying

FENESTRA

Fenestra® Fencraft Windows are made of high-quality casement sections of advanced design—fabricated into 51 different projected windows, 14 casement windows and 36 combination windows. Each good looking, finely made...and economical, because Fenestra's standardization plan permits volume production. For full information, see Sweet's Architectural File, section 16a/13, or write Detroit Steel Products Company, Dept. AR-3, 2252 E. Grand Blvd., Detroit 11, Mich.

Fenestra
FENCRAFT STEEL WINDOWS
FOR BETTER BUILDINGS
IDEAS come easier in a comfortable, well-lighted conference room like the one above. The General Electric 40-watt, instant-start fluorescent lamps in ceiling fixtures provide 60 footcandles of soft, comfortable light on the table, yet are shielded from direct view. Charts and displays on the tackboards are highlighted by the same ceiling lamps.

The two rows of G-E Lumiline lamps in the center of the ceiling provide a "bridge" between blackout (for film projection) and full lighting. They are controlled by a dimmer rheostat at the end of the table.

Whether you're designing a conference room, a home, or a department store, be sure to specify General Electric lamps. Their quality is assured by over 480 tests and inspections. And the more than 10,000 types and sizes of G-E lamps are being constantly improved by research to Stay Brighter Longer.

You can put your confidence in —

GENERAL ELECTRIC

THE BEST QUALIFIED HELP...THE HIGHEST QUALITY LAMPS

- FLUORESCENT
  Many new types, sizes, colors now available.

- PROJECTOR
  spot or flood. Moulded glass for ruggedness.

- REFLECTOR
  spot or flood lamps. Built-in reflector directs light where needed.

- SILVERED BOWL
  Indirect lighting at low cost. 60 to 1000 w.
To everyone about to order unit heaters, Modine says, "Look before you buy!"

**YES, look before you buy... and you'll buy Modine!**

Guesswork is gone from unit heater buying when you compare Modine with all other makes. Yes—your best judgment will tell you Modine is the leader—the only unit heater which gives you ALL these important features. Modern Beauty ... Individual Tube Expansion ... Velocity Generator ... Rugged Safety Fan Guard ... Patented Direct Suspension ... Built-in Air Control Device. What's more, you can choose from three types and 47 capacities to meet your specific heat, air delivery, height and location needs.

When you look before you buy, you'll see why Modine leads the field. Call your Modine Representative for further details. He's listed in the "Where-to-Buy-it" section of your phone book. Or write direct for Modine's new 52-page catalog. Modine Manufacturing Company, 1510 Dekoven Avenue, Racine, Wisconsin.

**Modine UNIT HEATERS**
LAWSON PRESENTS IMPORTANT NEW ADVANTAGES IN MODERN BATHROOM CABINETS

BONDERIZING

NOW! LAWSON BATHROOM CABINETS are Bonderized AFTER FORMING! AND they cost not a penny more!

AFTER FORMING provides 100% Bonderized protection to every point of surface; all edges and drilled holes are positively protected against rust and corrosion. The advantages of Bonderizing AFTER FORMING give Lawson Cabinets important new selling appeals.

ADVANTAGES OF BONDERIZING AFTER FORMING

1. Bonderizing AFTER FORMING protects all surfaces and edges. Resists rust and corrosion.
2. Enamel finish is bonded to metal at all points, for long life.
   AND Lawson Cabinets cost no more with Bonderizing AFTER FORMING!

BONDERIZING is a special chemical process sponsored by the Parker Rust Proof Company. It converts the metal surface to a thin layer of tiny phosphate crystals integral with the metal itself, making a perfect gripping surface for the enamel. Bonderizing shields the metal from moisture and its damaging effects.

THE F. H. LAWSON CO.
802 EVANS ST. CINCINNATI 4, O.
Established 1816

THE WORLD'S LARGEST BUILDER OF BATHROOM CABINETS
FLOOR DESIGNING is now a more important factor—because of Kentile. Kentile's 23 colors and 5 feature strip colors are combined so easily in countless designs that architects can now plan floors which are original, effective and in perfect harmony with all other elements.

CLEANABILITY achieves a new importance with the new, improved formulation of Kentile, especially in kitchens and foyers.

SMOOTH SURFACED Kentile floors are preferred by more and more women today, even in bedrooms and living rooms, because Kentile floors make house cleaning so much easier.

POURED CONCRETE slabs, with or without imbedded radiant heating, are helping to solve America's need for low cost housing—and with Kentile on top the house becomes a Home.

REMODELLING is also more effective today because Kentile can now be applied on sound double wood floors with T & G top boards not over 3” wide.

ECONOMY is synonymous with Kentile because it is so low priced and installation is so fast and simple.

KENTILE
Asphalt-Tile

DAVID E. KENNEDY, INC.  Brooklyn 15, N. Y.
New York 1, N. Y.

Boston 16, Mass.
Washington 6, D. C.

Kansas City 8, Mo.
Chicago 32, Ill.

Atlanta 3, Ga.
Cleveland 14, Ohio

Denver 4, Colo.
Los Angeles 21, Cal.

ARCHITECTURAL RECORD
For sure sink satisfaction!

**DESIGNED FOR BEAUTY AND EFFICIENCY** — Richmond ledgeback sinks with single or double drainboards are ideal for base cabinet installations in the most modern of kitchens. Drilled for deck-type supply fittings with hose and spray. Model shown is the Servilla, plate No. 1535, available in two sizes, 54" x 25" and 60" x 25".

Specify and install RICHMOND Enameled Cast Iron Sinks...

Sinks for any situation: Wall hung, for counter top, for base cabinets—left, right or double drainboard—single or double compartment. Whether your job is large or small,

Richmond has just the sink for you...Versatile design, acid-resisting enamel and rugged cast iron construction guarantee you a superior installation—one that assures customer satisfaction.

**BUILT-IN COUNTER TOP** installations are no problem to the Richmond line of fine enameled sinks. Shown here is the Shelton, plate No. 2115, a flat rim sink with double compartments—drilled for supply fittings. Sizes 32" x 21" and 42" x 21".

**WHEN ECONOMY** of space and cost is paramount, Richmond wall hung units, such as the Sewanee shown here, are just the thing. Unit illustrated as a modern roll-rim sink with single drainboard. Drilled for combination fittings and large strainer. Right drainboard (plate No. 1552) or left drainboard (plate No. 1550), both 42" x 25".

See your wholesaler or MAIL COUPON TODAY

Richmond Radiator Company
19 East 47th Street, New York 17, N. Y.

I am interested in further information on the Richmond Enameled Cast Iron sinks. Please send me full details. No obligations, of course.

Name
Company
Address

Vitreous China at its best is embodied in the Richmond line of fine lavatories.
now take it Point by Point

Specify Columbia Window Shades — and you get everything you could ask of a shade, plus a name that's known and trusted by millions of users.

Specify COLUMBIA PYROXYLIN — and you get more of everything you want! It's a super shade, Columbia's best! Check it point by point!

Columbia Window Shades and Venetian Blinds are sold only through Columbia Authorized Dealers — leading department and furniture stores and shade shops. May we send you samples of PYROXYLIN Window Shades and the name of the Columbia Authorized Dealer nearest you? Write today.

ACTUALLY PAY A PROFIT! Pyroxylin shades, because they're top quality, wear longer than the usual shade life expectancy... allow low maintenance costs... actually make a profit for you, as one large user puts it.

CUT REPLACEMENTS — PYROXYLIN IS WASHABLE! Takes to actual scrubbing — repeated washings — fabric remains firm and sturdy, colors stay fresh. It's waterproof, too, to rain, steam, dampness.

FORGET PINHOLES OR CRACKS! Pyroxylin shades are made on such a closely-woven base, without filler, that they're impervious to cracks and pinholes. Better, longer wear!

COLOR SCHEMING — TAKE YOUR CHOICE! Match or harmonize Pyroxylin with any color plans...14 solid colors, including high-fashion pastels and decorator darks. Duplex combinations, also. Popular PRINTED shades.

VELVET-SMOOTH TO OPERATE! Columbia's shade rollers, made in Columbia's own plant, take care of that! Dependable, silent service throughout Pyroxylin's career.

PIGMY TO GIANT SIZES! Your Columbia Authorized Dealer will make these fine shades to your exact window sizes.

THE COLUMBIA MILLS, INC. • 428 SOUTH WARREN STREET, SYRACUSE 2, N. Y.
French, Shriner & Urner chose METLWALS

for beauty, movability, durability

METLWAL Partitions and Paneling have a lot to offer! Metlwal alone combine distinctive beauty—simple construction—easy maintenance—and rapid installation. They’re factory-finished in rich wood grain reproductions or baked enamel ... will not reflect harsh, metallic light ... will not chip, crack or craze ... are Bonderized against rust.

METLWALS are installed in four easy steps by erection crews . . . (1) attach floor and ceiling channels; (2) insert studs in channels; (3) snap on panels; (4) slip on base. One man can handle a full-size panel. All parts and panels can be cut on the job. No need for plaster in new construction. No filler boards or patchwork. Only a few standard parts from warehouse stock.

And Martin-Parry’s modern production facilities, in our huge new Toledo plant (one wing shown below), insure uniform panels for interchangeability . . . long-wearing installations that hold maintenance costs to a new low!

Write today for your copy of our latest catalog A-3, containing METLWAL specifications, drawings and installation photographs. See how METLWAL can help you plan beautiful interiors. Send for information to: Martin-Parry Corporation, Toledo, Ohio.
Every clock in the building or plant showing the same uniform time to the second; signals ringing in synchronism according to any schedule; time recorders and time stamps uniform with system time — this is the new IBM Electric Time System with Electronic Self-regulation.

This is the great advance in time control which utilizes electronic principles. Clocks are merely connected to the nearest 60-cycle AC current, and are self-regulated continuously and automatically day after day, year after year, WITHOUT SPECIAL CLOCK WIRING.

The same time on every clock, on every signal, on every recorder — a real contribution to efficient coordination in your office building, school, hospital, plant, or hotel.

Call your local IBM office today or write to the address below for additional information.

IBM
TIME RECORDERS AND ELECTRIC TIME SYSTEMS
Proof Machines • Electric Punched Card Accounting Machines and Service Bureau Facilities • Electric Typewriters

International Business Machines Corporation, World Headquarters Building, 590 Madison Avenue, New York 22, N. Y.
For modern beauty • for long-time economy in apartments, homes, offices, stores, schools

This modern hardwood floor will last the lifetime of a home or building. Thus it's far more economical than floors or floor coverings that must be replaced every few years. It's a quiet, resilient, warm, comfortable floor • easy to keep clean and beautiful. Installation is simple: laid in mastic over concrete, or nailed over wood subfloor.

Available Again!

Increased production now makes it possible to furnish Bruce Blocks for large and small areas.

See our catalog in Sweet's, or write: E. L. BRUCE CO., MEMPHIS, TENN. • World's Largest Maker of Hardwood Floors
"The best seat in the school house"

Church Mol-Tex Seats are the preferred choice for schools because they give lasting service and complete satisfaction. Built to take plenty of punishment, they always retain their gleaming, attractive appearance. Specify Church Mol-Tex—the first cost is the last cost. They never need replacing.
Intruded tube holes—elliptical headers—two reasons why McQuay blast coils last longer. Inherent flexibility of the elliptube header plus the semi-bellows effect of the intruded tube holes puts warm-up loads where they belong—on the header and not on the core of the coil.

Blast coils take quite a beating, especially during the critical warm-up period. During the first three minutes of operation, unequal expansion places heavy stresses on the core—stresses that can cause eventual breakdown of the average coil.

McQuay blast coils are engineered to put the load on the heavy wall headers rather than on the thin wall tubes. McQuay headers in turn are designed to compensate for these stresses by flexing with the expanding or contracting core.

Flexible elliptube headers with intruded tube holes mean longer coil life despite operational rigors. Ripple-Fin construction with plate-type fins locked to tubes by hydraulic expansion means maximum heat transfer efficiency year after year. For all coil requirements and especially for high pressure applications it’s good planning to specify McQuay. Representatives in principal cities, or write McQuay, Inc., 1605 Broadway Street N.E., Minneapolis 13, Minnesota.
Outstanding Reasons for specifying Fiberglas Roof Insulation

Exceptionally low thermal conductance of Fiberglas Roof Insulation contributes markedly to interior comfort and heating economy. Permits use of minimum thickness for any desired degree of protection.

Virtual immunity to moisture. Its glass fibers will not rot or decay. (Accelerated weathering tests in an independent laboratory prove that Fiberglas Board, after the equivalent of 75 years service, retains the characteristics of a satisfactory insulation.)

Dimensional stability. Fiberglas Roof Insulation will not swell, shrink, warp or buckle. Recent technological improvements permit a substantial increase in rigidity without affecting its high insulating efficiency.

Low weight. Weighs only 1.31 lbs. per square foot in 1" thickness; adds no significant dead load to the structure.

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Whenever you want these qualities, you can specify Fiberglas with complete confidence.

"The Design of Insulated Roofs"

This 36-page manual contains a wealth of information on the design of roof structures, and gives full details on the proper specification of Fiberglas Roof Insulation. A.I.A. File No. 37. If you do not have a copy, write us today. Owens-Corning Fiberglas Corporation, Dept. 831, Toledo 1, Ohio...

In Canada: Fiberglas Canada Ltd., Toronto, Ontario.

*Fiberglas is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for a variety of products made of or with glass fibers.
Utilize this modern, versatile treatment for exterior sidewalls to achieve economy, beauty and durability. Pre-stained cedar shakes are being specified with increasing frequency because they offer the advantages of true parallel edges, machine-squared butts and attractive "combed" groove surface resembling natural hand split shake texture. Dip-staining while still dry from the kilns assures deep penetration of the protective, life-giving stains; and adds surface seal to eliminate expansion and contraction of shakes after application.

Modular exposure (optional from 8" to 16") of double-coursed shake sidewalls offers the architect greater flexibility of design, and the utilization of inexpensive "undercoursing" grade shingles for the concealed layers makes the double-coursing method of application truly economical. Tight joints, unbroken horizontal shadow lines, color variety and simplicity of application are inherent in Stained Cedar Shakes for homes of all sizes.

REFER TO SWEET'S FILE 8b/7a for complete details and specifications

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- Crex-Dipt Company, Inc., North Tonawanda, New York
- Everett Shingle & Shake Company, Everett, Washington
- Capilano Shingle Company, Ltd., Vancouver, British Columbia
- Perma-Products Company, Cleveland, Ohio
- West Coast Stained Shingle Co., Seattle, Washington
- Portland Shingle Company, Portland, Oregon
- Ward Insulators, Seattle, Washington
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THRUSH Adjustable Supply Tees for perfectly balanced one-pipe heating, are now available in bronze for solder connections as well as cast iron. You may offer the many advantages of the Ajustaflo System with either copper or steel pipe installations. Heating efficiency is improved because just the right amount of water may be diverted to each radiator. Convenient exterior lever adjustment determines the amount of hot water passing from the main through each radiator. This assures uniform heating in every room. Flow of water through the main is increased... not throttled... when branch flow is cut down by this method.

For more information on Thrush Ajustaflo System or Adjustable Supply Tees, see our catalog in Sweet's or address Dept. J-3

H. A. THRUSH & CO.
PERU, INDIANA

PERFECTLY BALANCED ONE-PIPE HEATING
Schlage ... first name in cylindrical locks

Chicago's Wesley Memorial Hospital
a Schlage installation of heavy-duty cylindrical locks.
Architects: Fugard, Burt and Wilkinson
Successors to Thebar & Fugard

Illustrated at left was used in this outstanding hospital.

Schlage
Lock Company
San Francisco · New York
Prominent architect selects KIMSUL* for low cost, high insulating efficiency

Designers and builders of every type home across the country are discovering that it pays more to insulate with KIMSUL. For KIMSUL offers an exceptional combination of low cost and high insulating efficiency (0.27).

KIMSUL is the only many-layer stitched blanket insulation, and provides an entirely different kind of comfort. "KIMSUL comfort" means uniform temperatures throughout every room in the house! No thick spots—no thin spots where heat can leak out. KIMSUL comes in light, handy compressed rolls, so it's easier and more profitable to install. No need for skilled workmen or expensive machinery. And the fire-resistant PYROGARD* cover is an exclusive feature of this fine insulation.

For further information and free technical literature, see your KIMSUL dealer. Or simply write to:

KIMBERLY-CLARK CORPORATION
KIMSUL Division • Neenah, Wisconsin

America's Finest New Homes
Are Insulated With KIMSUL!
the modern "fuse box" is now...

That's right! When short circuits or dangerous overloads occur, the Thermal-Magnetic action of the ® THERMAG Circuit Breaker Load Center instantly and automatically opens the circuit and trips the circuit breaker handle to "off" position. Then, safely and conveniently, a simple flip of the handle to "on" position restores the circuit to normal operation. And there is nothing to replace!

On harmless momentary overload, the thermal action of the individual circuit breaker maintains the circuit without needless interruption of service.

In cases of smaller capacity requirements, the new ® JUNIOR Circuit Breaker Load Center provides automatic protection for small residences, garages, stores, etc.

For more information, consult your ® Representative (he's listed in Sweet's) or write for Bulletins No. 202 and 203.

Frank Adam Electric Co.
ST. LOUIS 13, MISSOURI

MARCH 1949
Roddiscraft
Symbol of Quality for over 50 Years

HARDWOOD PLYWOOD
FIR PLYWOOD
FORMICA

Belt sanded to
satin smoothness

Edges clean
as a whistle

Corners...
precision true

The knowledge and experience gained through
more than fifty years of working with wood is built
into Roddiscraft plywood. You can see the differ­
ence in faces, edges, corners—it's a quality product.
You know Roddiscraft knows your needs when
you deal with our warehouses. They are service­
centers equipped and stocked to meet the needs of
customers in each area.
This combination of quality products and service
keyed to your needs is a Roddiscraft tradition.

Fir Plywood
Available in both interior and
exterior grades. Complete ware­
house stocks in standard sizes
and thicknesses.

Roddiscraft Hardwood Plywood
Lumber and veneer core — available in a
variety of domestic and foreign woods.
Standard sizes and thicknesses available for
immediate delivery from warehouse stocks.

Formica sheet stock available in a wide variety of colors and patterns.

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DEALERS IN ALL PRINCIPAL CITIES

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Roddis Plywood Corporation
Formerly Roddis Lumber & Veneer Co.
MARSHFIELD, WISCONSIN
ARCHITECTS and ENGINEERS

This message will also appear in a broad list of publications that are read by the men you seek to influence... your prospective clients.

Highlights on low lighting costs

HAVE you ever looked into the cost of a simple job like moving or adding a fixture in an ordinary lighting system?

First, there are new materials—wire, conduit, junction box, outlet box, hangers, etc.; then, labor expense for splicing, threading, bending, taping, etc.; finally, loss of production while power is shut off for connections.

There is no need to see profits drain away like this. Plug the leak with BullDog Universal Trol-E-Duct.

BullDog Universal Trol-E-Duct is a flexible electrical system providing current where you want it, when you want it. Every inch of the enclosed copper bus bars in Universal Trol-E-Duct can be utilized as an outlet for lighting fixtures. You can plug in for current at any point along its slotted duct. Bus bar capacity: 50 Amps., 250 Volts.

BullDog Universal Trol-E-Duct is 100% salvable, thus lends itself to major or minor plant changes. Simply dismantle prefabricated parts and reinstall to meet your new requirements. Not a single piece need be scrapped.

Ask your local BullDog Field Engineer to show you a Universal Trol-E-Duct installation in your own neighborhood.

BullDog Field Engineers welcome the opportunity to sit in with you during the early planning stages of a building project. Their knowledge of electrical distribution layout can mean savings in installation costs, as well as efficiency and reliability in actual operation. Why not take advantage of this service?

BULLDOG ELECTRIC PRODUCTS COMPANY
DETROIT 32, MICHIGAN • FIELD OFFICES IN ALL PRINCIPAL CITIES
IN CANADA, BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO

BULLDOG ELECTRICAL DISTRIBUTION

BullDog Universal Trol-E-Duct is prefabricated in one to ten foot lengths for easy installation. A variety of couplings with specialized purposes join sections. Connections slip together; no nuts or bolts.

Terminal Tw istout Plug, one of several types used to tap current from Universal Trol-E-Duct. Duct also accommodates movable trolley-type outlets.

Inserting a twistout plug is easy. Contact end is inserted in slot and twisted. "L"-shaped supporting fingers slide easily over top of duct.
This Indiana housing development features "Century" Asbestos-Cement Siding on first stories, with K&M "Century" Apac board used as skirting at the foundations.

On this attractive home, "Century" Siding creates a pleasing effect, while blending with other materials.

For low-cost housing developments or individual homes...

K&M "Century" Asbestos-Cement Siding provides maximum protection with beauty and simplicity

When you specify "Century" Asbestos-Cement Siding, you provide a trim, attractive appearance... while guaranteeing a practical, fire-weather-and-rot-resisting exterior that will actually toughen with age.

"Century" Siding has a deep-grained, weathered cypress finish that effectively duplicates wood... with thick butts that cast the deep shadow line your clients desire. It resists attacks by rodents and termites, never needs protective painting.

In computing your costs, remember "Century" Asbestos-Cement Siding comes in large unit sizes, 12" x 24", which make for speedy, economical application. Any good carpenter can install them easily and quickly. Investigate the full benefits of "Century" Siding. Your letter will receive our prompt attention.

Original manufacturers of Asbestos-Cement Shingles in this Country

KESBEY & MATTISON COMPANY • AMBLER • PENNSYLVANIA

ARCHITECTURAL RECORD
Another BIG APARTMENT PROJECT SELECTS SARCOThERM

Simplified Heat Control

The engineers of this six acre F.H.A. development, providing 217 moderate priced apartments, assured utmost heating comfort by deciding on Sarcotherm Control for the forced hot water system.

"Simplicity and Low Cost" were again the deciding factors. More and more engineers are realizing that the luxury of a control that modulates for both outside and inside temperatures is also an economy—in first cost, in fuel, and in maintenance costs.

Sarcotherm has thrived on comparisons. On plans, on price, in service, the more you compare, the better Sarcotherm looks. Why not see some of the many jobs in your territory?

Sarcotherm

SARCOThERM CONTROLS, INC. • Empire State Bldg. • NEW YORK 1, N. Y.

MARCH 1949
Hundreds of homes have been built around Servel ALL-YEAR Air Conditioning

When you plan new homes around Servel All-Year Air Conditioning, you not only provide your clients or buyers with a heating and cooling plant; you give them comfort. For, with a Servel unit, the home owner can control his indoor climate the year round . . . at the flick of a finger.

In summer, the Servel All-Year Air Conditioner refrigerates the air, removes sticky, wilting humidity. In winter, this same unit floods the home with warmth, adds just the right amount of moisture for comfort. In between seasons, Servel circulates air without drafts or "layers" of hot and cold air. Year round, Servel filters out dust, dirt, and irritating pollen. And no effort or extra work is required on the part of the home owner. He simply dials the desired climate and flips a switch for cooling or heating.

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MARCH 1949
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One of a series of papers prepared by leading authorities on air conditioning. The opinions and methods presented are their own and are not necessarily endorsed by Kinetic Chemicals, Inc.

AIR CONDITIONING THE MODERN SPECIALTY SHOP

by Bruce Jacobi, Chief Engineer, Lerner Stores Corporation, New York.

Bruce Jacobi, a graduate engineer of Carnegie Institute of Technology, has complete control of design and installation of air conditioning systems in chain of 200 stores in 42 states. He is a member of the A. S. H. V. E.

Because women spend from 20 minutes to well over an hour in the average specialty shop, air conditioning serves a double purpose. It affords both comfort for customers and protection for merchandise. Ordinarily, without air conditioning, merchandise losses may run high owing to handling, perspiration, staining and the like. A "pre-cooled" customer who tries on a dress seldom damages it.

STORE ENTRANCE DOORS

One of the most critical points in cooling or heating the busy store is at the entranceway. Adequate provision for this area facilitates conditioning the main sales area.

Doors are opened so frequently in most shops that cooling loads must be calculated on the assumption that they are constantly open. For this reason it is necessary to develop a positive air pressure at the entrance and to provide for exfiltration of air into the store lobby. This may be accomplished by adjusting the return air damper on the sales floor until a positive pressure condition is obtained at the doorway.

In tall buildings, a stack effect is frequently prevalent. In such cases, the return air damper adjustment may be insufficient to effect suitable exfiltration into the lobby. A supply outlet above the entrance, however, can be designed to deliver sufficient air to blanket infiltration.

Heating during cold months is as important as cooling during the warm periods. For the cold seasons, a booster heating coil—controlled by a thermostat located near the doors—may be placed in a supply duct at the entrance. In some instances, a thermostatically controlled unit heater can be recessed in the wall near the entrance. Care should be taken to avoid insufficient, or excessive, heating, at this point.

Multiple entrances in wider stores will require a separate centrifugal blower installed in the hung ceiling above the entrance, or in the basement below it. A separate duct system with cooling and heating coils and high velocity ejectors, installed along the entire width, is most effective.

AIR DISTRIBUTION

Air distribution presents a different problem for each store. It is contended by many that wall type grilles frequently interfere with decorative plans and that, like light sources, air outlets should not be apparent. Hung ceilings allow for architectural blending of lighting fixtures with the air outlets, and the use of ceiling air dispersal points permits designing a draftless type of distribution.

SYSTEMS

In larger stores with installations of 50 tons or more, two or more separate air conditioning units,
each complete in itself, will provide better results than one large, central unit with a single blower. The separate units increase flexibility and allow greater ease of operation. In the event that one unit becomes inoperative, the other continues to function and the store will not then be entirely without air conditioning. Several small units also permit by-passing one into another if required during a breakdown period. Although more expensive to install, the savings over a period of years, obtained through flexibility of operation and better air conditioning, more than offset initial costs.

An air conditioning system does not improve with age and use. It is therefore desirable to install a system slightly larger than design calculations indicate to overcome inefficiencies which may develop, such as dirt collection on coils or normal wearing of mechanical parts.

**FITTING ROOMS**

This area has a more concentrated occupancy than any other part of the store. Generally it is enclosed with a low ceiling and is separated from the sales area. Customers spend more time here than in other areas.

It is desirable to install a separate zone from the fan outlet into the fitting room area. A booster coil connected to a small condensing unit may be installed within this duct and a booster coil may also be placed in it. The area usually requires slightly higher temperature than other parts of the store because customers disrobe while trying on various garments. A two or three degree differential has been found satisfactory in most cases.

It is important that a sufficient amount of outside air be circulated in fitting rooms to prevent odors. This air must be rapidly exhausted, discarded and not re-circulated.

**DOUBLE PLENUM SYSTEM**

Zoning is important where more than one sales floor is encountered. Recently, many stores have been designed with the double plenum hot and cold deck, blow through system (see diagram). Thermostatically controlled dampers regulate conditions in each zone. The double plenum system has the advantage of concentrating all air conditioning equipment in one room. It possesses a vast amount of flexibility in being able to divert heating and cooling loads from regions where they are less required to areas in which there is a heavy concentration.

**LIGHTING and SHOW WINDOWS**

Lighting in most stores is designed to maintain a level of 35 to 50 foot-candles. Because of color distortion in apparel shops, fluorescent lighting is generally confined to decorative treatments and incandescent lighting is used as a primary source. Consideration should be given to the popular trend of eliminating show window backings. Where formerly an insulated partition separated show windows from sales areas, today the windows of many stores are part of the general sales area.

Windows are normally lighted along their periphery with 150 watts per running foot. In addition, during the cooling season the solar effect upon the window, with increased cooling load, must be considered. Conversely, heat loss is experienced during the colder periods of the year. Glass of low thermal conductivity aids in reducing this condition.

To overcome increased loads, air outlets are required within display window areas. These provide comfort for window trimmers and also provide protection for materials that are affected by extremes of heat or cold. A concealed blower and heating coil above the window ceiling, so placed that air is directed against the glass, will prevent frosting and objectionable condensation... keeping the window clear at all times.

* * * * *

In specifying air conditioning equipment for modern stores, restaurants, theaters, and other public gathering places, it is well to be certain that the recommended equipment is designed to utilize "Freon" refrigerants. These refrigerants are safe... nontoxic, nonflammable, nonexplosive, noncorrosive, anhydrous, and are as pure as scientific methods of manufacture can produce. They assure dependable, economical operation of the system and aid in prolonging its useful life. Kinetic Chemicals, Inc., Tenth and Market Sts., Wilmington 98, Delaware.

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Architect: Pietro Belluschi, Portland, Oregon

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MARCH 1949
Wellington C. Mepham Central High School, North Bellmore, L. I., New York
Frederic P. Wiedersum, Architect

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When you come to think of it (and we hope you will), the designs submitted in competition are most revealing — and in more ways than one. They disclose present architectural virtues, vices and significant trends, as well as discovering a modicum of hidden talent. They are worth far more than a casual glance and a dismissal with a note of personal approval or rejection. The designs inherently reflect and express current influences, philosophies, tastes, theories, educational emphases, esthetic tenets — and these, rather than the designs themselves, are food for thought. They thus reveal much of the present state of architectural design — and are portents of its future. They may even suggest that it is time to take stock of the current approaches and emphases with an eye to clarifying our own thinking and establishing a new or reaffirmed direction.

It is natural, in part because of the forward-looking sponsorship of the competition, that one should find no designs that hark back to period stylism. All are in the vernacular and idioms of the present. It is not difficult, however, to find the sources of inspiration (or imitation) for most of the designs; the great tradition of architecture — eclecticism — is still evident. The designers no longer choose the masses, molding and mannerisms of Brunelleschi, Bramante, Sanmicheli and Vignola, but select as models the works of Mies, Wright, Corbusier, Gropius, Breuer or other modern masters.

As has always been the case, some designers use their chosen precedent intelligently, others adopt unthinkingly forms or details from the latest magazine-featured building. Novelty of design rather than appropriateness of form to purpose too often proves more intriguing to the young (or old) disciple whose mental processes do not involve analysis.

Too few designs show minds and hands thoroughly trained to plan for use — to analyze the activities to be housed and the character of the space and facilities to serve them. It takes imagination as well as logic to provide an environment that is both thoroughly convenient in use and a joy to experience. Too many plans submitted seemed to be exercises in abstract pattern rather than indications of thoughtfully organized space for people to use and enjoy.

This preoccupation with form may indicate the current dominance of the esthetic interest in architecture rather than the materialistic, scientific, or so-called "functional." Such an interest may augur well for the future of the fine art of architecture, whether one expects or hopes the developments will tend toward "monumentality," "the new empiricism," "indigenous localism," the "organic" or what have you.

Whether or not you find that any of the designs chosen by the jury solve the problem of a Mid-Western community center "which will arouse civic pride as well as serve its particular function," we commend to your attention the designs and the jury report and comment as indications of the influences of present educational methods, current periodicals, and professional design leadership on the younger generation whose genius or talent will not always be hidden.

Kenneth K. Stowell
Editor
The jurors are puzzled by a plan. In the usual order, Wallace K. Harrison (hiding Morris Ketchum), Eero Saarinen, Mies van der Rohe, and Dean Hudnut. Below: Mr. Ketchum is no longer hidden

The jury looks up at a design still in the running. From left to right, Morris Ketchum, Ludwig Mies van der Rohe, Eero Saarinen, Wallace K. Harrison and Dean Joseph Hudnut

APPROXIMATELY 500 designs were submitted in the Hidden Talent Competition. These came from every part of the country and furnished as a whole an arresting presentation of the attitude and the ideals of our younger designers in the field of architecture.

In general it can not be said that the impression created by these designs is an inspiring one. Most of the designs were humdrum in the extreme and the quantity of gold which they unearthed seemed shockingly disproportionate to the dross. Most of the competitors seemed well satisfied to present a practical or commonsense arrangement of the elements and then to clothe these with the familiar clichés of modernism. Rare, indeed, was the designer who attempted to draw from the work to be done and the method to be used that organic form and expression which are the essentials of good design.

The jury gave First Prize to the design of Mr. Joseph Yusuru Fujikawa, of Chicago, because it seemed to them that the design he submitted did possess that kind of organic order which has its source directly in the purpose of the building and in its structure.

It may be thought that a design which is symmetrical in its space arrangement and as simple as the Parthenon in its outward aspects could not be called modern, but to the jury it seemed quite obvious that this symmetry of space was not forced upon the program from some academic source and that the simplicity of the enframe­ment was arrived at through a sincere desire to achieve an expression consistent with the idea of community participation. After all, the requirements of the building were very simple and certainly did not require that torturing of space into all manner of strange relationships and forms which was characteristic of at least half of the designs submitted and it seemed to the jury that no expression could be more suitable for the life of the community than classic purity in outward form. Community life is not expressed in extreme individuality but rather
The Jury, beginning its work January 7th, 1949. Final decisions were made on the 8th. Seated, Philip C. Johnson, Professional Adviser (Museum of Modern Art); Ludwig Mies van der Rohe, Director, Department of Architecture, Illinois Institute of Technology. Standing, left to right: Wallace K. Harrison, Director of Planning, United Nations Headquarters; Eero Saarinen, winner of Jefferson National Memorial Competition; Kenneth K. Stowell, Professional Adviser (ARCHITECTURAL RECORD); Morris Ketchum, author "Shops and Stores"; Joseph Hudnut, Dean, Graduate School of Design, Harvard University, Chairman of Jury.

in that serene universality which we associate with Greek architecture and which it should be our effort to recapture and make visible in terms of our own technologies.

The Second Prize — a design submitted by Mr. G. Lee Everidge, of Oklahoma City — would seem at first glance to present a curious contrast to the design given First Prize. Certainly it lacks the classic restraint and dignity of the First Prize entry. The jury nevertheless felt that more than one form of expression might be appropriate to the program and that a design based upon the exploitation of present-day structural techniques and upon an ordering of space which is in every way simple and organic might deserve almost equal consideration with the more abstract beauty of the design awarded First Prize. The relationship of lounge, lobby and auditorium is admirable and if the relation of the structure to the spatial pattern is somewhat arbitrary it does not, at any rate, do violence to good sense in planning and construction. There is about the Second Prize design a certain sculptural quality which gives it great interest. Its esthetic might be defined as structural baroque — a form of expression certainly not wholly uncongenial to a mechanized civilization. Some members of the jury could not accept the use of a costly and conspicuous ramp as a means of access to general purpose rooms in a balcony, but it must be admitted that this feature is a source of vitality and interest in the design.

The Third Prize, submitted by Mr. Edward Chase Weren, of Bloomfield Hills, is a design which in many ways achieves the more classic qualities of the design given First Prize. Mr. Weren's design is indeed the most original in conception among those submitted and it combines in a striking way novelty of esthetic expression and excellent judgment in the arrangement of plans. The lounge is so placed as to command wide vistas into the surrounding park, while the elements placed to right and left are enclosed in a double enframement — first of glass and then of stone. This contrast of open center and enclosed areas might well result in a pattern of great distinction and beauty. The sense of enclosure would play against the open vistas in a charming manner, and the quality of lighting, especially that of the auditorium, would be not only novel but certainly most satisfying. It may be that in the Third Prize design there is lacking that sense of the community which seemed to the jury to be an essential in the expression to be given the building. Community life could hardly be expressed in an enclosure of blank stone walls. Perhaps also the intimate quality of the interior spaces would be more suitable for a residence than for a public building.

The design submitted by Herbert S. Johnson, of Gainesville, Florida, was given Fourth Place since it offered a plan which seemed logical, even if somewhat more loosely organized than the designs previously mentioned. Mr. Johnson has exploited two of the favorite clichés in modern design; namely, the butterfly roof and the court open through the roof. These were once interesting devices but it must be said frankly that they have lost something of their novelty after 100,000 repetitions.

The design awarded Fifth Place submitted by Mr. William R. Reed, of Chicago, won the jury by its daring originality and the boldness of its attack upon the problem. Had the theme been other than that of a community centre, this design would have received a higher rating; but the jury found it hard to reconcile the design with the requirements or the expression of a mid-western community.

The design of Mr. Louis F. Mammier, of Brooklyn, New York, would have received a higher place, had it not been for the strange inconsistency of judgment which weighted a row of metal columns with a wall of rubble masonry. Mr. Mammier's plan is excellent, not
only because of its good sense but also because of a feeling of organic unity throughout the enclosed spaces, and its exterior has a reticence combined with a bold exploitation of modern techniques which is admirable.

The design submitted by Mr. Clifford G. Foreman, of Homestead, Pennsylvania, shows competence in the organization of facilities but seems a little complex in its outward forms for so small a building.

The design of Mr. Edward Fearnley, of Gainesville, Florida, held the jury's attention for a considerable period of time, and his design was considered one of the most original and daring among those submitted—especially in its management of flowing space—but as a whole it lacked those practical qualities which were obviously essential to the program.

The design submitted by Mr. Spero Paul Daltas, of Boston, is that of a man who is especially sensitive to spatial values; and that of Mr. George Rafferty, of St. Paul, pleased the jury by its clarity in plan, organization and exterior expression.

Elton M. Hoops, of Pontiac, Michigan submitted a plan showing very great promise but it was not sufficiently studied; and the design of Mary Ellen Linberger, of Brooklyn, although admirable in directness of organization, was held to be somewhat too Spartan in exploitation of exterior elements.

The design of James V. Hirsch, of St. Paul, was much too busy in plan for so simple a building, giving on the exterior an effect more suited to a commercial building than a building devoted to civic use.

It was the feeling of the jury that the Museum of Modern Art and the Architectural Record have rendered an important service to the architectural profession in the conduct of this competition, which was in every way exceptionally well managed. We hope that the experiment will be repeated frequently.

A Few Thoughts about the Hidden Talent Competition

I would like to add a few thoughts to the Jury's report. It seems to me that the outcome of the competition can be taken as a statement that there are certain aspects of architecture that should be emphasized—simplicity, the need for an over-all concept in a building, a clear structural system, and, in some cases, the need for a certain formality. I wholeheartedly concur with this, but I also see the danger in an emphasis on these aspects too early in the design of the building. One runs the risk of designing from the inside out. I therefore would like to emphasize the one thing that is fundamental in any of these expressions of architecture: whatever the expression may be, its roots should be in life itself—the way the building is used and a love for the people who use it.

To illustrate what I mean, I would like to focus on one plan. In my opinion, the plan by Clifford G. Foreman has these qualities to a high degree, I think more so than many placed higher than his. His plan is a clean, simple, unsophisticated plan, and one can tell that he understands the life and the problems around a community building as they are in actual life. One can tell that, while designing the building, he imagined himself entering the building and using the lounge, the game room, etc. In a community house, there is the problem of both separation and concentration. Small committees and meetings need to be closed off, but for other occasions, such as dances, much of the space should be thrown together. Mr. Foreman has understood this part of the problem well. Office, coat room, fireplaces, storage spaces, toilets, etc., are all located well in relation to the normal activities of the community house. Perhaps the only criticism I have is the location and size of the kitchen. A larger kitchen located to serve one or two of the small rooms as well as the auditorium please many a sewing circle. While cost was not a limitation of the program, still we cannot divorce economy from architecture. I think it is to Mr. Foreman's credit that he did not embark upon an extravagant solution. Few communities could afford anything but a modest solution; and if they could, they would add more usable space instead of architecture. It is unfortunate that the over-all mass of the building, as well as its exterior treatment with too complicated roofs, is not up to the standard of the very livable, honest plan.

I am not writing this in the spirit of a minority report, because we were all pretty much in agreement on the Jury. I am writing it more as a postscript on my thinking about the competition.

E. S.
Joseph Y. Fujikawa, Chicago, Illinois

Born in 1922, attended the University of Southern California 1939–42, and then went to Illinois Institute of Technology where he received his degree B.S. in Architecture in 1944. He served in the United States Army 1944–45 and since 1946 has been in the office of Ludwig Mies van der Rohe, and also has been doing graduate work at Illinois Tech.
SECOND PRIZE: $750.00

G. J. Lee Everidge, Oklahoma City, Okla.

Of part Choctaw Indian descent, he was born in Oklahoma in 1926, studied architecture at University of Oklahoma 1943. After serving in the Army Air Corps 1944-45, returned to University of Oklahoma, then moved to North Carolina State College to continue his studies with the same faculty which went to organize the new School of Design at North Carolina
THIRD PRIZE: $500.00

Edward Chase Weren, Bloomfield Hills, Mich.

A native New Yorker, born in 1920, he received his secondary education at Phillips Academy, Andover, Massachusetts, received his A.B. at Harvard College, 1942. Served as a lieutenant in the U.S. Naval Reserve 1942-46, received his degree of B. Arch. 1948 at Harvard University where he was awarded the A.I.A. School Medal. Was associated with the architectural firm of Keckham, Gina and Sharp, and is at present with Saarinen, Saarinen and Associates.
HONORABLE MENTION: $50.00

Herbert Johnson. Born in Chicago 28 years ago, he attended Chicago Latin School, and the Asheville School, Asheville, North Carolina, before entering the University of Florida, College of Architecture and Allied Arts. He served three years with the Seabees in both European and Pacific Theaters of the war, married, and returned to the University of Florida in 1946.

HONORABLE MENTION: $50.00

William R. Reed. Moved from Cincinnati where he was born in 1922, to Chicago in 1930, where he later entered the American Conservatory of Music. He attended Harvard University, 1940, the Institute of Design, 1941, and served with the Army Air Force from 1943-46. He is associated with Robert Bruce Tague, A.I.A., and is currently remodeling a Chicago building as his office.
**HONORABLE MENTION: $50.00**

Louis F. Mammier. Born and educated in New York state [son of Louis E. Mammier, architect], he graduated from Pratt Institute, Brooklyn, with degree of B. Arch. in 1948. He received 1st prize in Brooklyn A.I.A. Design Competition, 1947. He served with the U. S. Area Engineers at Steward Air Field, Newburgh, New York; and is now with architects Lorimer Rich and Robbins Conn.

**HONORABLE MENTION: $50.00**

Clifford G. Foreman. A Pennsylvanian, born in 1926 in Pittsburgh, he received his secondary education in Homestead, Pennsylvania, and is now a student in the Department of Architecture of Carnegie Institute of Technology.
HONORABLE MENTION: $50.00

Edward M. Fearney, A.I.A. Born in 1915 in Providence, Rhode Island, he attended Brown University, but transferred to Carnegie Institute of Technology, B. Arch. 1939. Served as Marine Aviation Cadet, and worked in Newfoundland and on the Alaska Highway. Was with Dickey Associates, Architects, in Honolulu; now teaching in the University of Florida, College of Architecture and Allied Arts.

HONORABLE MENTION: $50.00

Spero Paul Dalles. A native of St. Paul, age 28, he attended the University of Minnesota 1938–43, receiving his B. Arch. degree. He was a gunnery and torpedo officer on a destroyer in the Pacific from 1943–46, was an architectural designer for Northwest Airlines 1946–47, received M. Arch. at M.I.T. in 1948, where he won the Chamberlain Prize. Now with Carl Koch and Associates, Cambridge, Mass.
HONORABLE MENTION: $50.00

George E. Rofferty. A native of St. Paul, Minnesota, born 1917, he graduated in architecture at the University of Minnesota 1942. He was a sergeant in the Air Corps and an instructor 1942–46. He is a designer with Ingenman, Bergstedt, and Cavin, Jr., architects, in St. Paul, and an instructor in design at the University of Minnesota.

HONORABLE MENTION: $50.00

Elma M. Heeps. Born in Brooklyn, New York, in 1924, she graduated from Middlebury College, Vermont, in 1946, having majored in liberal arts. Though she has had no formal architectural education she shares with her husband, a graduate student at Cranbrook Academy of Art, Bloomfield Hills, Michigan, an intense interest in the development of modern architecture.
HONORABLE MENTION: $50.00

Mary Ellen Linberger. In 1926 she was born in Youngstown, Ohio. She took the liberal arts course at Rosary College, River Forest, Illinois, 1943-45, before going to Pratt Institute, Brooklyn, where she is now a senior in the department of architecture. She received the Pratt Alumni award, “outstanding junior student”, 1948, and received an honorable mention in the New York State Housing Competition 1948

HONORABLE MENTION: $50.00

James V. Hirsch. Born in Medford, Wisconsin 25 years ago, he studied at the University of Minnesota, graduating with distinction in 1947 with a degree B. Arch. He served in Europe as a sergeant in the Infantry 12th Armored Division 1943-46, and is now a designer with Ingemann, Bergstedt and Cavin, Jr., of St. Paul, Minnesota
ARCHITECT-ENGINEER OFFICES, PEORIA, ILLINOIS

When this architectural firm expanded to the point of designing its own building, it chose an outlying site, about a mile from the center of the city, on a fairly prominent hillside. The building is placed to be seen from a considerable distance, and is floodlighted at night. The building was designed to provide exceptionally good working conditions for a total personnel of 36; besides 8 architects, there are 5 licensed engineers, 18 draftsmen and superintendents, a delineator and 4 stenographers or accountants, including as a not-unimportant part of the facilities, parking space for the employees' cars. Scruggs and Hammond were the landscape architects. The heating and air conditioning system includes several innovations, some experimental. Heating combines radiant heating with forced warm air, permitting a large volume of ventilating air to be circulated. The duct work is divided into two zones, so that different exposures may be separately heated or cooled. To reduce water consumption in the cooling period, an evaporative condenser was installed with the compressor. Dehumidification is exceptionally important for hot Illinois weather, especially in a drafting room, where humidity hampers drawing. Air handling equipment can supply 100 per cent fresh air, when weather conditions are propitious. A tri-ethylolene vaporizer is installed in the ventilation system on an experimental basis, in the belief that it may cut down absenteeism due to colds. The architects point out that it frequently has had this result. So far, however, no definite conclusions have been reached regarding its effectiveness in this particular office.

MARCH 1949

Office Building of J. Fletcher Lankton

John N. Ziegele and Associates

Architects and Engineers

Exterior is of Indiana limestone, backed with insulating concrete block. Large pieces of stone are shot sawed; ashlar is of long pieces of two different thicknesses.
Drafting room walls are the concrete blocks, painted with two coats of resin emulsion paint; in other rooms the block is plastered and painted. All ceilings are acoustic tile; floors are rubber tile, except in executive offices where carpet is used. The basement contains, besides air conditioning equipment, a model shop, dead files, and an employees' lunch room, where the coffee making equipment is always much appreciated.

Above: view of reception room, looking toward entrance. Right: conference room. Below: general office, looking toward receptionist’s desk and waiting room. Indirect lighting of the display renderings is effectively arranged in connection with the cabinets.
So you're going to
... or at least Mexico City where much modern architecture has bloomed against the rich background of former periods. So here are a few candid shots of recent buildings and a decorative and useful map (overpage) showing their locations and other points of interest, prepared by Susanne Wason-Tucker especially for ARCHITECTURAL RECORD and your edification.

1. Office Building, Victor de la Lama, Architect

2. Hotel Prado (opened 1948, 660 rooms), Carlos Obregon Santocilia, Architect

3. Left, Office Building, Pani & del Moral, Architects.

4. Right, Office Building, Mario Pani, Architect

5. Office Building for Eastern Airlines, Juan Sordo Madeleno & Augusto Alvarez, Architects (1947)

Numbers refer to locations indicated on the map (overpage)

6. Office Building, Mario Pani and Enrique del Moral, Architects


8. Hotel (partially hidden by billboards) by Mario Pani, Architect

9. Apartment House and Shops, Augusto Alvarez, Architect

See also "Modern Mexico," by Ann Binkley Horn, ARCHITECTURAL RECORD, July 1947, pp. 70-83.
Map and sketches drawn by Susanne Wasson-Tucker

MARCH 1949
10 Students' Center, "San Cosme," Enrique Yáñez, Architect (1947)

11 Normal School for Teachers, Mario Pani, Architect (ARCHITECTURAL RECORD, July 1947)

12 Social Security Building, Carlos Obregón Santacilia, Architect

13 Hotel by Ingeniors Associates, Architects

14 Office Building, Ramón Marcos, Architect

15 Apartment House, Juan Sordo Madaleno, Architect

16 Apartment House, Juan Sordo Madaleno, Architect

22-A Medical Center of the City of Mexico: Children's Hospital, José Villagrán García, Architect (ARCHITECTURAL RECORD, October 1944)

22-B Medical Center of the City of Mexico: Cardiological Institute, José Villagrán García, Architect (1948)

23 Malt Factory, Fernando Cervantes, Architect (1945-48)

26 Housing Project, Apartment Group, Mario Pani, Architect

27 Bull Ring and Stadium, M. Roland, Engineer in charge
A BRIEF LIST OF SOME OF THE ARCHITECTS

AND NEW BUILDINGS IN MEXICO D. F.

AUGUSTO ALVAREZ
Calle de Mississippi 31
Apartement House
Alfonso Herrera 11
Office Building
Paseo de la Reforma and Avenida Morelos
Office Building
Avenida de los Insurgentes and Tomatlán
Office Building
Avenida de los Insurgentes and Monterrey
Office buildings while associated with Jean Sordo Madaleno
Own Residence, "San Angel," Simon Yarte 11
"ARTECNICA"
Avenida Juárez 88
"Turf Club!
18 Kilometers from the City on the way to Toluca
LUIS BARRAGAN
Paseo de la Reforma 137
Garden on the Pedregal, and Development of Private Residences Pedregal
FERNANDO CERVANTES
Avenida Juárez
Malt Factory
Colzada de Cuilhuacan and Batuiri
MAX CETTO
Avenida Juárez 139
Coyoacán D. F.
Residence
Calle Tonel Tacubaya

Residence
Guerrera 10
San Angel D. F.
(with John McAndrew)

CARLOS CONTRERAS
Edificio la Nacional 1004
Avenida Juárez No. 4

VICTOR DE LA LAMA
Paseo de la Reforma 1
Office Building
Avenida de Mayo and Condesa

ENRICO DE LA MORA
Avenida Juárez 30
General Hospital
Medical Center of the City of Mexico
Colzada de la Piedad and Pasteur
Center for Mothers and Infants
Colzada de Maderoer and Guernavaca Railroad

ENRIQUE DEL MORAL
Paseo de la Reforma 503
Pavilion for Infectious Diseases
Medical Center of the City of Mexico
Colzada de la Piedad and Pasteur
Office Buildings
(with María Pani)

JUAN DE MADARIAGA
Apartement House
Avenida de los Insurgentes and Chilpancingo

JOSÉ VILLADRÁN GARCÍA
Calle de Palma 30
Medico Center of the City of Mexico
Colzada de la Piedad and Pasteur

Maternity Pavilion
Children's Pavilion
Cardiological Pavilion
Tuberculosis Sanatorium
Coyoacán
"Canto Rico" School
INDUSTRIA NACIONAL S. A.
Ruiz Galinde
Industrial Development, Housing, Recreation
Guadelupe, Road to Pachuca

CARLOS LAZO
Avenida Sonora 80
Office Building
Paseo de la Reforma, near Paris
Residence
Sierra Lengua 374
Lomas de Chapultepec

LUIS MACGREGOR
Military Hospital
Avenida del Castillo
Lomas de Chapultepec

JUAN SORDO MADALENO
Avenida Morelos 110
Apartement House
Paseo de la Reforma and Colzada
Gral Marias
Office buildings, while associated with Augusto Alvarez

MARIO PANI
Paseo de la Reforma 503
Normal School for Teachers
Colzada Mexico-Tacuba and Avenida de las Maestras
National Conservatory of Music
Paseo de la Reforma and Atlántico
Emergency Pavilion,
Medical Center of the City of Mexico
Colzada de la Piedad and Pasteur

Hotel
Van Sullivan and Ramón Gutzmán
Office Building
Paseo de la Reforma and Artes
Office Building
Paseo de la Reforma and Francia
Church
Calle de Leibnitz
Housing Project
Avenida Coyocan and Cuerpas

GONZALEZ REYNA and AROZARENA
Avenida Juárez 56
Factory "Crown Cork de Mexico" Colonia Vallejo
Textile Factories Arzappalotz

GIL ROBLES
Filmstudios
Colzada de México a Tlalpan Churubusco

M. ROLAND
Engineer in charge
Bull Ring and Stadium
Avenida de los Insurgentes

CARLOS ORREGON SANTACILIA
Calle Lisboa 22
Hotel Prado
Avenida Juárez and Luis Maya
Social Security Building
Paseo de la Reforma and Toledeo

ENRIQUE YÁÑEZ
Calle de Emparaz 35
Students Center "San Cosme"
Centro Scator Ribera de San Cosme
Avenida Ribera de San Cosme and Fresno

MARCH 1949
George P. Turner, Designer

"DESIGN FOR LIVING—WITH KIDS"

Residence of Mr. and Mrs. George P. Turner, La Canada, Calif.

When the Turners decided to design their own house their central idea was what they call a "Design for Living — with Kids." The youngsters were not to be "pigeonholed," yet every member of the family was to have his share of privacy. A study of the plan on the opposite page will show how successfully the necessary compromises were worked out.

The house was designed by Mr. Turner himself, a radiant heating engineer, who made every nook and cranny conform exactly to the requirements and preferences of his family. The kitchen, for example (see photos, next page), seems to be unusually workable, organized as it is into zones of preparation, etc., grouped around a special refrigeration unit designed and built by Mr. Turner. A happy feature while the children are young is the clear view of the sand box and play area obtainable from the kitchen.
Every room in the house opens to the patio, seen in the two views above (left, the living room; right, the bedroom wing). The carport, a corner of which is shown in the small view above, doubles as a lanai. The kitchen (below) is organized into working areas grouped around a departmentalized refrigeration unit combining all required temperature zones; a breakfast bar separates kitchen and dining area (below, left). Lighting throughout the house is predominantly indirect, and much special equipment is built in
The master bedroom (above) looks directly out to the children’s sandbox, which will be converted to a reflecting pool when the children have outgrown it. Below: the built-in dressing table and storage unit in the master bedroom. Interior finish is natural redwood and painted or stained plywood; exterior is redwood siding. Windows are aluminum double hung; floor coverings are asphalt tile and hemp matting. Heating, of course, is radiant. Careful orientation shades every room from the hot Southern California afternoon sun.
What about school costs? How are costs affected by school planning? Can a modern "finger-plan" school be built within the same price range as a conventional school, or are its advantages bought at a price premium? How does a single-story school compare in cost with a two-story school?

These and other cost questions are important today. The first half of the century has brought some enormous improvements in school standards. Meanwhile the birth-rate has outrun us, and so have the costs of materials, labor, taxes, and overhead organization. We have to remember: better schools for all children!

In last year's school study, the RECORD concentrated entirely on standards, chiefly those of the visual environment in school. Mr. Clapp, of the Michigan Department of Public Instruction, expressed the opinion then that such standards could be obtained in the "cold-winter" eastern states as well as the "warm-winter" west. We now open this question to research.

To start things, Alonzo Harriman and Philip Gatz, school architects of the saving state of Maine, have made a thorough study herewith presented. It contains some surprises. One of these is the great effect on cost of room height as compared to span. Incidentally, the champion performer among school plans to date, in their calculation, is the one-story plan with double-loaded corridor, and a trussed pitched roof.

Among examples shown are some striking cases of schools built at low cost. But standards have also been advancing. Among executed examples, we show two more "top-lighted" schools — one of them Ernest J. Kump’s improvement over last year’s model, and another the contribution of Wm. Arild Johnson in the Northwest; also the remarkable "portables," p. 128.

Low maintenance cost of ceramic tile is combined with utility of corkboard nailing strip in Quaker Ridge School, N. Y. by Howard S. Patterson, Architect and Francis Keally, Associate

To eliminate costly crawl space and "slab on grade," the floor of this New Jersey school was made of a concrete slab, on which were laid rows of concrete block, 3 ft. on centers, running from window wall to corridor. On these was stretched steel lath supporting another 2-in. slab, eliminating form work. The hollow space was used as return ducts for air originally supplied from plenum over corridor, by means of univent. This eliminates exterior-wall crawl space, reduces piping, wall boxes, grilles. A finned tube under windows is auxiliary heat source. Alexander Merchant & Sons, Architects
A COST STUDY OF SCHOOL PLAN TYPES

EDITORS’ NOTE: READ WELL BEFORE USING!

Here at last is a method of testing school plans for comparative structural cost, using real figures. These have been assembled by the partners in an architectural firm that has designed successful schools over a period of 69 years in Maine, the frugal, cold-water State.

What the authors have done is to collect those unit costs which are significant in establishing the comparative structural cost, per square foot and per classroom, of various accepted plan arrangements. They themselves explain carefully how this has been done.

Authors and editors both wish it clearly understood, however, that figures given do not, in general, represent total building costs and cannot be used to estimate what the final cost of a school building, or part of a building, of any given size or type should be. They are useful only as a basis of comparison among plan arrangements.

We believe that the authors have demonstrated a splendid working method. Although the actual figures would be modified in different localities, the method is one which any reader can set up for himself, filling in with correct figures for his locality, and come to a sound result.

We believe there is a strong presumption in favor of the authors’ general conclusions, on a country-wide basis, and there are some interesting surprises among these conclusions. Editorial commentary has been added where the Maine situations seem to be specialized, and we invite the further commentary of our readers.

Further studies will be published by the same authors adding factors of upkeep and maintenance, and of mechanical equipment such as heating and lighting.

The Editors

THOUGH an intimate association with schoolhouse construction over a period of the past 29 years, I am convinced that it is the community, and not the building committee, that determines whether an architect continues doing schools. And no matter how good a completed schoolhouse may be, if it has cost too much, they never forget it.

As we all know, this country’s need for new school construction is astronomical, and funds are hard to get. If we can help the community get one or two classrooms more for the same money, by sound engineering planning, we justify the human usefulness of our profession.

My partner, Philip Gatz, has analyzed the contractor’s cost sheet for every school that we have built, and the figures which follow are taken directly from the current cost sheets of contractors. Since our purpose is to study the effect of different plan arrangements on structural cost, and not to establish the full final cost of any one school, the figures in the table on the next page cover materials and labor only. They do not include overhead or fees of any kind.

This first installment of our study is in two parts. In the first part, we compare a typical section, composed of a corridor with either one or two adjoining classrooms of standard length (varying the other dimensions), and again the same thing in two stories.

Basis of Cost Comparison of One-Story Types (Non-fireproof)

Floor area of unit considered includes one half corridor for double units shown, and whole corridor for single units.

Construction cost analysis, in general, is based on level of ground floor as the starting point and includes side walls, roof, corridor walls, one end partition in each classroom, wood stud partitions, ceilings strapped with wood strapping, walls and ceiling covered with gypsum board, painted.

The material and labor prices used to arrive at estimated square foot cost are net without overhead or profit.

The square foot prices indicated are to be used only as a basis of comparison between different types of construction.

The assumption has been made that the foundation and ground floor construction will not materially affect the relative costs of the various types so that the cost of these items is not reflected in the square foot comparison.

The assumption has also been made that the cost of heating, plumbing and electrical installations is an independent cost factor of the various types so that the cost of the same is not included in this square foot comparison.

Basis of Cost Comparison of Two-Story Types (Semi-fireproof)

Floor area of unit considered includes adjoining corridor.

Construction cost analysis, in general, is based on level of ground floor as the starting point and includes side walls, upper floor, roof, corridor, lath and plaster ceiling and one end partition in each classroom of semi-fireproof construction.

The square foot prices indicated are to be used only as a basis of comparison between different types of construction.

The assumption that foundations, ground floor construction, heating, plumbing and electrical installations will not affect the relative cost of the various types has been made in this comparison, the same as in the case of one-story non-fireproof types. These costs are not included in the square foot comparisons.

* Figures compiled by Philip Gatz, partner of Mr. Harriman, Alonzo J. Harriman, Inc. Architects

ENGINEERS

MARCH 1949
### TABLE 1  COMPARATIVE STRUCTURAL COST, IN SCHOOLHOUSE SEGMENTS OF STANDARD LENGTH

Costs given cover selected structural factors only. What these factors are is fully described on page 111, preceding the table.

**GROUP 1.** Schools with double-loaded corridor and unilateral daylighting; classrooms facing approximately east and west, in 1-story or 2-story buildings

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<tr>
<td></td>
<td>Roof construction: wood joist, wood-sheathed deck, rigid insulation covered with 20-yr. tar and gravel roofing</td>
<td>Roof construction: steel open-web joist with wood nailers, wood-sheathed deck, rigid insulation covered with 20-yr. tar and gravel roofing; corridor reinforced concrete slab exposed on ceiling side</td>
<td>Floor construction (2nd floor): open-web steel joist with 2½-in. concrete slab, with metal-lath and plaster ceiling applied directly to bottom of joist; corridor reinforced concrete slab exposed on ceiling side</td>
<td>Roof construction: steel open-web joists with wood nailers, wood-sheathed deck, rigid insulation covered with 20-yr. tar and gravel roofing; continuous metal skylight</td>
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<td>Corridor wall construction: concrete to window sill, steel frame, direction glass block, metal sash and hopper vents</td>
<td>Corridor wall construction: concrete to window sill, steel frame, direction glass block, metal sash and hopper vents; corridor walls: bearing wood stud partition</td>
<td>Corridor wall construction: concrete to window sill, steel frame, direction glass block, metal sash and hopper vents; corridor walls: bearing wood stud partition</td>
<td>Corridor walls: steel frame, wood studs under, clear glass over; corridor ceiling: wood joists, insulation with batts, covered on underside with gypsum board</td>
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<tr>
<td></td>
<td>Per sq. ft. $3.52</td>
<td>Per sq. ft. $3.56</td>
<td>Per sq. ft. $3.97</td>
<td>Per sq. ft. $4.16</td>
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<td>Per sq. ft. $3.59</td>
<td>Per sq. ft. $3.57</td>
<td>Per sq. ft. $3.97</td>
<td>Per sq. ft. $4.16</td>
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<td>Per sq. ft. $3.63</td>
<td>Per sq. ft. $4.04</td>
<td>Per sq. ft. $3.97</td>
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<tr>
<td></td>
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<td>Per classroom $3.85</td>
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<td>Per classroom $4207</td>
<td>Per classroom $4182</td>
<td>Per classroom $4731</td>
</tr>
</tbody>
</table>

### AUTHOR’S CONCLUSIONS FROM ANALYSIS OF PLAN TYPES

1. An analysis of the square foot costs of the constant height building shows that in all cases the square foot cost decreases with an increase of the span.

   As the span increases, and the height remains constant, the additional roof cost is not sufficient to offset the lower resultant cost per square foot of the total building area.

2. An analysis of the square foot cost of the classroom with a variable height shows an increase in cost as the span increases. The height in this case varies

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**TABLE 1**

112 ARCHITECTURAL RECORD
in accordance with the recommendation of the National Council or the state law.

As the height increases in proportion to the span, in accordance with state law and national code, the additional roof and wall cost is great enough to more than offset the lower resultant cost per square foot of the total building area.

3. This would seem to indicate that a typical building similar to Type X, with a pitched roof and bilaterally lighted, and a minimum height at the eaves, would be the most economical type of schoolhouse to build.

We would suggest classroom floors 24 ft. by 36 ft. and an eaves' height of 9 or 10 feet, and a height at corridor wall under skylight of 12½ feet to classroom ceiling. This building would have a continuous skylight similar to Type X.

4. In all cases shown here, wood construction is cheaper than steel. It should be noted that over 30-ft. classroom span steel will probably be cheaper than wood.

MARCH 1949

TABLE 2:

SCHOOL COST COMPARISON

One-story Semi-fireproof,
One-story Combustible Roof
and Two-story Semi-fireproof

This comparison is based on identical construction in both the one- and two-story semi-fireproof buildings, employing poured concrete to the first floor window sills, steel sash set in the steel building frame with glass block above, and corrugated asbestos cement spandrels over wood studding insulated with batts in the two-story building. The second floor and roof construction are poured concrete slabs over bar joists in classroom areas, with poured concrete slabs spanning between concrete corridor walls for both second floor and roof.

First floor in either building is poured concrete over fill, using framed slabs over the boiler room. Ceilings in semi-fireproof buildings are lath and plaster and in combustible buildings are of acoustic tile. Floors are of asphalt tile. The roof is insulated with fiber board over concrete for semi-fireproof construction. Batt insulation is used in ceiling of combustible building.

The wood roof used in the one-story combustible roof building is composed of light wood trusses 24 in. o.c., covered with tongue and grooved sheathing and slate surface asphalt shingles. The corridor wall in this type is wood studs covered with ½-in. gypsum board on both sides.

<table>
<thead>
<tr>
<th>COST ESTIMATES</th>
<th>One-story Semi-fireproof</th>
<th>One-story Combustible Roof</th>
<th>Two-story Semi-fireproof</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost</td>
<td>$194,564</td>
<td>$189,142</td>
<td>$203,437</td>
</tr>
<tr>
<td>Total Area</td>
<td>13,660 sq. ft.</td>
<td>13,660 sq. ft.</td>
<td>16,214 sq. ft.</td>
</tr>
<tr>
<td>Cost sq. ft.</td>
<td>$14.25</td>
<td>$13.84</td>
<td>$12.54</td>
</tr>
<tr>
<td>Cost per classroom</td>
<td>1946</td>
<td>1891</td>
<td>2034</td>
</tr>
</tbody>
</table>
Brewer School, Maine, by the same architect, is of concrete frame, with exterior facing and brick piers of Canadian brick. Glass block (directional) are in steel frames carried over steel operating windows making up vision strip. Spandrels of corrugated asbestos backed by insulation help to make the wall texture rich and interesting at low cost. Let in 1947 at $9.91 per sq. ft. Projecting wing houses kindergarten.

**Author's Conclusions on Costs in Table 2**

A further breakdown will follow in the April issue.

1. An analysis of total cost of two-story semi-fireproof, one-story semi-fireproof and one-story combustible shows a saving of 4.3 per cent in favor of the one-story building.

The same one-story building with combustible roof shows a further saving by use of combustible roof of 2.7 per cent or a total saving of 7 per cent between the one-story combustible roof and two-story semi-fireproof building.

2. In general, the one-story plan shows a saving in the net area due to the omission of stairs.

3. The following factors show an increase in construction cost:

   **A. In the one-story building**
   - Excavation
   - Foundation Walls
   - Roofing
   - Heating and Ventilating

   **B. In the two-story building**
   - Concrete floor construction
   - Masonry
   - Carpentry
   - Steel Frame
   - Ceramic Tile

Shop of Brewer School, Maine, is on a sloping site. On the sloping site each floor has direct egress, permitting non-fireproof mill construction. Cost $7.37 per sq. ft.

March 1949
A HIGH SCHOOL AT LOW COST WITH FACTORY CONSTRUCTION

Memorial High School and Gymnasium, Calais, Maine

Alonzo J. Harriman, Inc., Architects-Engineers
As in all of this architect's schools, the academic, administrative, and athletic elements are separated — the athletic so it can be used independently. The conference and clinic room (see plan) is used also as a teachers' room large enough to accommodate the entire staff. The off-stage storage room still remains as cafeteria and lunch room; two sittings take care of all students who remain for lunch. The last-minute demand for an instructor's room between kitchen and gym gave the architect a little trouble with his front.

Structure is of concrete frame, using lally columns at the exterior wall, so that the wall together with the corrugated asbestos spandrels carries no roof load, and windows reach to full ceiling height. Bricks were imported Canadian. There is vapor heating system with unit heaters ventilating out through corridors. Walls between classrooms are a "utility" type of prefab partitions, faced with Transite both sides, and "standing up very well," giving some flexibility.

Built in 1946-47, the total building cost $9.10 per sq. ft. or 81 cents per cu. ft. including gymnasium. Without gymnasium the figures were $10.55 and 81 cents.
A large school shop, seen to the right, occupies the area underneath the gymnasium floor; the other rooms are a typical classroom and science laboratory. In both may be seen the lally-column supports under concrete beams, which permit windows to extend up to the ceiling.

Gymnasium doubles as auditorium, and, as may be seen, the stage is large enough to serve as a practice room for music. The playing floor is 87 by 89 ft. Spectators are accommodated to the number of 600, although it is said that for a big basketball game the capacity comes closer to 1,000.
One of a group of rural schools, this is reported by the architect as having cost only $6.34 per sq. ft., 51 cents per cu. ft., or $7,360 per classroom, "complete with various bookshelves and cases but exclusive of asphalt tile floor." No sacrifice was made in essentials of good environment; on the contrary, classrooms are square, large; have ample bilateral daylight; have radiant heat (wrought iron pipe in floors). Cost-saving methods: (a) cinder block walls entirely on modular grid; (b) "absolutely no cutting of block, wood ceiling joist, or oversize wallboard (finished with cold-water paint)"; (c) low rural labor cost; (d) "well detailed plans, easily interpreted by small rural contractors."

Another nearby school, almost complete, by the same architect, shows a contract cost of $7.86 per sq. ft. with more complete finish — structural tile toilet partitions; lockers; acoustical plastered ceilings; asphalt tile floor. The Milan school has just been completed.
A CHILDSCALED SCHOOL IN A FRESH MODEL

Shoreview School, San Mateo, California

By Ernest J. Kump & Mark Falk

Again this architect has given a vivid expression to the idea of a school as a pleasant place for children.

Like the Laurel School by the same architect (Record, Jan., 1948) and the Barstow School (March, 1948), it is top-lighted; but instead of a skylight, which might involve maintenance factors, there is a high clerestory. This has been managed with a minimum disturbance to the quiet sheltering roof lines; and the low eaves height brings the school into nice scale with the surrounding bungalow-type houses (photograph, page 123). (A low eaves height has been found, incidentally, to be a prime factor in holding down school building costs — see page 113.)

On the south side, windows have been eliminated altogether (photograph, opposite page).

Exterior walls are stucco; roof shows wood and steel, with stainless steel fascia. Olive-green doors set off stone-gray walls, terra cotta red trim.
The very excellence of Mr. Sturtevant's photography in conveying how the interior is put together has one disadvantage. The lens subtends a wider angle than the main field of view of the child's eye; the ceiling and the clerestory light are far less prominent in the child's normal way of looking. Because the "top light" is well above the 60° central cone of vision of seated children looking straight across the room, the architect has omitted any baffles to screen off the glare of the sky. Such baffles, he contends, add initial cost and maintenance; and he prefers to use the restraining effect of tempered obscure glass up above. In other schools of the same model, now under construction, there has been restored a set of south transom windows.
Opposite page, typical classroom; this page, kindergarten, both looking east. Interior walls are plywood, floor asphalt tile, ceiling acoustic tile. The soft effect of the fireproof curtain suggests that more use might be made in the U.S. of drapes and awnings, as is done in Switzerland and Scandinavian countries. The glare of white houses seen through windows is to be screened by planting.
Above are seen typical sections. The section at the right is of the north window wall. The way the flatted top plate (in the circle) fits against the roof arch may be seen by comparison with the corresponding plate of the south wall (arrow in top drawing). The structure is of rigid steel frames at 16-ft. spacing, the roof deck is carried on wood purlins. Roof was covered with asphalt shingles instead of wood shakes as seen in drawing. Drawings at bottom of page show how partitions are connected; and photographs give a clear indication of the way the structural frame is kept independent of all walls and partitions for flexibility. South overhang (small photo, opposite page) is solid because no windows; the latticed overhang to the north admits more light to windows while cutting glare. Note stainless steel fascia.
TRANVERSE FRAMING MAKES TOP DAYLIGHT ECONOMICAL

Schools in Edmonds, Washington

In the Pacific Northwest, as well as the Bay Region, there has been some desire to bring the open, California, side-corridor in out of the weather, and to "double-load" it for economy. Yet square classrooms are retained for teaching convenience and shortening of the building length. Auxiliary top-lighting is then needed for inside areas of the wide-span classroom. In San Francisco, Frank Wynkoop achieved this by a kind of "monitor" system supported on a heavy longitudinal steel girder (RECORD, June, 1945). Here we see, instead, the monitor carried on a series of transverse beams of laminated wood — in some examples with the aid of trussing cased in plywood (see photographs); in other examples by the unaided, uncased beam. The roof deck is of mill construction. The architect contends that the combination, for a room of 30-ft. span, is cheaper than conventional joists for a room of 24-ft. span.

Directional glass block, in the upper part of the outside wall, even out the curve of light intensity toward the middle of the room, where it otherwise tends to dip in a room with this vertical section. Clerestory or monitor windows, being out of view when pupils are at work, are left with obscure glass. Low brightness differences in the visual environment are further controlled by paint of calculated reflection values, furniture and asphalt tile floors of light color. Exterior construction is of concrete block, oil-painted, with natural-finish pumice block interior partitions (all non-bearing); no plaster; acoustic tile above bulletin board height (these being of monk's cloth over cane board); chalk-boards bright green. Wardrobes are heated slightly by electricity, and vented by fan into the attic.

Costs were reported, for erection during 1947, at $9.23 per sq. ft. for structure only.
In photographs may be seen interiors of the Edmonds Grade School. The corridor side of a classroom 30-ft. deep is daylighted by a high monitor or clerestory, which is supported on a series of transverse beams of laminated wood. These are aided by trusses and the structure cased in plywood. In other schools the laminated truss does the work alone and is uncased (sketch).

Plan is of Esperance Grade School, with classrooms similar to those of the Edmonds Grade School. Vertical section, across-page, shows alternate construction with dihedral roof and the top-light nearer center of room. The system is reported economical. The scheme tends to complicate the building mass.
CONSTRUCTION is now going forward, after years of research, on this unusual project.

It attacks directly the most vexing problem of school people: how to provide adequate accommodations, not makeshift, and yet without bankrupting the community, for a school population which not only multiplies fast but also shifts. Such shifts can result in local decline (in the very face of the general growth) leaving heavy school investments derelict, and tempting communities into makeshift solutions.

In Seattle, Director of School Planning Byron B. Smith put before Architect Stoddard the problem of an immediate critical need, in several districts, for classroom space, with foreseeable need for additional space within two to five years, then a gradual reduction in load back to the present need, and perhaps to the point of final elimination. Temporary classrooms were discarded as a solution. There evolved the theory of the first-class transportable school. To make the story short, this meant a minimum of fixed facilities that could be expanded or contracted, and a maximum of facilities that could be moved.

Building codes strongly affected the classroom plan. Since 12-ft. ceilings were required except in one-room schoolhouses, each classroom was designed as a one-room schoolhouse with 10-ft. ceiling. (A 12-ft. height would be totally unnecessary for lighting and ventilation in this type of room; also, the unit must pass under trolley wires and bridges.) Next, the one-room schoolhouse had to be spaced 10 ft. or more from its fellows; hence the intermediate courts (see plan). Central heating was adopted instead of unit heating. Corridors were needed only as a means of distributing children and services, every classroom having direct outdoor egress.

A basic 4-room school is the starting point. A boiler room has been erected with a boiler installed capable of handling 8 classrooms, and with provision for a second boiler handling 4 classrooms more, plus auditorium. Corridors with 3-ft. crawl space come next. Heating connection to classrooms is by 2 unions which can be connected and disconnected in a matter of minutes. (Classroom heating is by a split system of convectors plus unit heater-ventilators.) One flexible connection serves for electricity. Toilet rooms are provided between classrooms; the initial program also includes a combination office and teachers' room, book room, janitor's closet. The second step is to add 2 to 4 more classrooms with additional corridor; also the main office and health room. The third step adds the combined auditorium, playroom, and cafeteria, big enough for a gymnasium, to remain as a community facility if the remainder of the school is dismantled.

Upon the decline of the local school load, the school will be removed room by room, either to a new site or, where need develops, to replace obsolete types.

Promising high economy, the saving of this scheme
Component parts of transportable school, and plan of "Dover School"

is not so much in initial cost (only slightly under conventional types) but in replacement. Fully equipped, these rooms can be moved and relocated for at least 50 per cent less than a relocated portable, say the architects, while full amenities are provided. "As a result we have a permanent school but the equivalent of a movable site."

Models were used to demonstrate the progressive growth and the subsequent dismantling which is possible in two schools under construction in Seattle. (Figures show the anticipated school population during the years of use.) The final school ends with the same capacity as the initial one, except that a permanent gym-cafeteria-auditorium is left behind, as a community facility, even though the school may later be totally removed.

Although the mobility is like that of "temporaries," the equipment and environment are up to the firstclass standard.
SCHOOL architects should all be familiar with the studies of school building problems by W. W. Caudill, classics in their field (Space for Teaching, published by The Texas Engineering Experiment Station, College Station, Texas, and the film Building for Learning issued from the same source). Those who have studied these essays are aware of the importance which the author, working in the Southwest, attaches to natural ventilation by prevailing breezes. In a pair of schools for Blackwell, Oklahoma, of which the first is under construction, the author and his partners have seized the opportunity to practice what they have been preaching.

SOUTHWEST

SCHOOLS THAT UTILIZE THE PREVAILING BREEZE

First Unit for Blackwell, Oklahoma

Caudill, Rowlett, Scott, Architects

The preliminary plans, reproduced herewith, show classroom wings placed in accordance with the dictum that "the distance between groups should be no less than five times the height of the classroom." The first of the vertical sections shows graphically how an air stream has been found to travel by actual tests made at College Station with smoke candles. The result is different from that which is too often found drawn in on the diagrams of the unknowing. Thus a projecting member, such as a canopy or porch roof, seems to deflect the air stream in such a manner as to make a window opening directly above it almost useless as a device of ventilation; and air must be drawn through underneath.

In general, the Blackwell scheme bears a resemblance to the Fairfax school by Bamberger & Reid (Record, Jan. 1949). Corridors and outdoor classrooms are both to the south.

Plans call for steel frame, cavity brick wall construction, steel sash, concrete floor slabs with radiant heating.
WATER-REPELLENT PRESERVATIVES FOR WOOD

By F. L. Browne, Chemist

Forest Products Laboratory, Forest Service, U. S. Department of Agriculture

Although water-repellent preservatives and their related products are popularly regarded as recent developments, they have been in use for many years. Wood window sash have been treated with them for a decade and a half. During the wartime a number of new applications were found that stimulated wider interest in them.

Products of the kind are sold under various trade names; until recently there have been no recognized collective names for them. In 1948, however, the National Door Manufacturers' Association published suitable names and definitions for five kinds of products as follows: NSP water repellent for wood, NSP preservative for wood, NSP water-repellent preservative for wood, wood sealer, and preservative wood sealer. The letters NSP stand for "nonswelling, paintable," meaning the wood does not swell when the product is applied and can subsequently be coated with ordinary paints and varnishes.

All of these products are designed for treating wood quickly and with equipment that is simple, inexpensive, and readily available. The preferred method of treatment is by dipping, which requires dip tanks, but other methods of application also are used, such as brushing, spraying, mopping, and roller coating. Wood treated by such superficial methods takes up only limited amounts of the material applied, which penetrates only a short distance into the wood. Into the end-grain of pine sapwood, which is relatively easy to penetrate, the water repellents, NSP preservatives, and water-repellent preservatives may go as much as 2 or 3 in. but into the heartwood they seldom go as far as ¾ in. Into the side-grain even of sapwood the penetration rarely attains as much as ½ in. Wood sealers penetrate even less deeply.

With such limited penetration and absorption the superficial treatments cannot give wood the degree of protection or preservative obtainable by slower, more costly, but more thorough methods. These newer products, therefore, do not compete with the long established methods of wood preservation or with the more effective procedures for stabilizing the dimensions of wood. For severe conditions of service the more thorough methods remain more economical in the long run despite greater initial cost and inconvenience.

The newer products find their proper use where the conditions of service are not severe enough or the chance of adverse conditions arising are not great enough to justify the more thorough methods of treatment. A vast amount of wood falls in this category. In the past it has commonly gone untreated. Too often it has given poor service or has had to be repaired or replaced when a moderate degree of treatment would have kept it in satisfactory condition. The availability of the water-repellent preservatives and related products makes neglect of such treatment less easily excusable in the future.

General Considerations

The shallow penetration obtainable by superficial application makes it necessary to do all or practically all of the surfacing, cutting, and fitting of the wood before it is treated. After treatment little or no wood can be removed from any of the surfaces without laying bare untreated wood. If some cutting must be done subsequently, as in fitting windows or doors at the site or cutting pieces to length, the cut surfaces should be retreated before the parts are fastened in place. Delaying treatment until the carpenter work has been done may sometimes inconvenience closely scheduled production lines, but it has the advantage of saving waste in treating wood that eventually turns up as sawdust, shavings, cuttings, or rejections.

The best point for applying treatment in a production schedule comes after all cutting, fitting, and boring out before assembling the wood parts. Surfaces that will be concealed after assembly are then freely accessible to the treating solution. The water repellents, NSP preservatives, and water-repellent preservatives, however, have the property of penetrating well into even well fitting joints, especially if the application is by dipping. When desired, therefore, woodwork to be treated with these products may be assembled but not glazed before they are dipped. Sealers do not penetrate joints so well; they are best applied before assembling unless they are used chiefly for decoration rather than for protection.

Gluing should be done before any of these products, except the NSP preservatives, is applied. Water repellents and sealers tend to interfere with gluing by impairing the strength of the glued joints. On the other hand the preservatives that contain neither water repellents nor sealers cause little if any interference with gluing providing the wood has been dried long enough after treatment for all of the solvent in the preservative to escape.

Thorough drying to remove solvent is likewise necessary before the treated wood is painted. Sealers dry rapidly because they do not penetrate far into the wood and because they are often made with solvents that evaporate quickly. Even after the wood has been thoroughly dried, however, water repellents and water-repellent preservatives retard the drying of most coatings slightly and some of them seriously. The delay in the drying of finishes is
troublesome in operations in factories with closely planned production schedules, especially if the finishes are lacquers. For ordinary painting of buildings the drying is not retarded enough to delay the painters unless dark-colored enamels, such as trim and trellis, porch and deck, or quick-drying enamels are applied directly on the treated wood. No such trouble should be experienced if the enamels are applied over priming paint or enamel undercoater, as they properly should be in any case.

**Water Repellents for Wood**

The nature of the essential ingredients in the commercial water repellents for wood is usually kept as a trade secret. Products having all of their important properties, however, might be made by dissolving 2 or 3 per cent by weight of paraffin wax and 5 or 10 per cent of resin in mineral spirits of suitable solvent power. The wax imparts the water repellency but it tends to interfere with subsequent painting or gluing of the treated wood. The resin largely overcomes the interference with painting but is not so successful in the matter of gluing. Almost any resin that is soluble in mineral spirits will serve. A drying oil such as linseed or tung oil may be used in place of part or all of the resin, but oil and resin are not first cooked together as in varnish making, because that would reduce the extent to which the product penetrates into wood. Mineral spirits is the volatile thinner commonly used in paints and varnishes; the grade needed for water repellents is one having good solvent power and a flash-point not less than 100° F. by the Tagliabue closed-cup method.

Water repellents retard changes in moisture content and in dimensions of wood. They furnish the maximum protection yet obtainable by superficial methods of application that leave the wood practically unchanged in appearance and susceptible to almost any of the decorative finishes generally used on wood. The treated wood may be varnished, stained and varnished, painted or enameled as may be decided upon later. Water stains, however, may not spread readily on wood treated with water repellant nor color it evenly.

Water repellents afford a practicable means of protecting wood against changes while it is being shipped from factory to place of erection or while it is held in storage. Such protection, however, should not be taken as an excuse for omitting the precautions that should normally be taken in handling fine woodwork.

Neither water repellents nor other protective coatings make wood waterproof. They do not alter the capacity of the wood to take up moisture or to swell proportionately. They merely delay the changes by making it harder for moisture to pass in or out through the surfaces. For wood exposed to even changing conditions of dampness and dryness such delay serves to hold the wood closer to an average moisture content and dimension than would be the case without protection. Protection is most effective when the conditions of exposure fluctuate rapidly; it becomes useless for prolonged exposure to a steady extreme of dampness or of dryness.

Water repellents afford wood better protection than can be assuredly obtained with a single application of other coating materials such as sealers, varnishes, paints, enamels, and lacquers. On the other hand water repellents give much less protection than can be obtained with two or more applications of surface coatings. But considerations of cost and the practicalities of fabrication usually limit the surface coatings to the surfaces exposed to view and leave the concealed surfaces entirely unprotected even though they may be accessible to moisture. Moreover, surface coatings do not last long on surfaces subject to mechanical wear and are unsuitable for nicely fitted, sliding joints such as between window sash and frame.

Water repellents, therefore, are particularly valuable for furnishing protection to those parts of woodwork that otherwise are generally left entirely unprotected. They effectively supplement but are not good substitutes for the older types of protective coatings.

**NSP Preservatives**

The NSP preservatives for wood are solutions of fungicides or fungicides and insecticides in volatile solvents, such as mineral spirits, that do not swell wood. The reliable commercial products disclose the kind and amount of fungicide that they contain. For treating window sash and millwork the National Door Manufacturers' Association accepts preservatives that contain not less than 5 per cent by weight of pentachlorophenol, tetrachlorophenol, chloro-2-phenylpheno, or their mixtures. Commercial preservatives also are made with other fungicides such as zinc naphthenate and, when its green color is acceptable, copper naphthenate.

NSP preservatives made with pentachlorophenol may contain a small amount of resin or nonvolatile oil to prevent blooming. Blooming is a deposition of crystals of pentachlorophenol on the surface of wood as it dries after treatment. It mars the appearance and may irritate the skin and mucous membranes of workers.

When applied by superficial methods the NSP preservatives guard wood ade-

(Continued on page 174)
SECOND THOUGHTS ON RADIANT HEATING

Some do's and don'ts to insure good performance

By W. P. Chapman* and R. E. Fischer†

Unlike most innovations in the building industry, radiant heating had quick public acceptance. People wanted such a heating system - one that would provide added comfort, reduce operating costs, be invisible and save space, and have the advantage of cleanliness. Yet while there is admittedly laboratory and field investigation to be done, the theory is far advanced and there are a great many facts known which, if utilized, will go a long way toward insuring good performance from a radiant heating system.

Most occupants of radiant heated structures are enthusiastic about their heating systems. Performance may not come up to expectations, however, if special considerations in the design of radiant heating systems are overlooked.

MEETING THE HEATING LOAD

The first requisite of a radiant heating system is that the heat from the available panel area be sufficient to meet the loss through the structure and to ventilation. In most cases, structures are insulated well enough for economy reasons to keep conduction losses low. High ventilation rates, whether due to infiltration or to forced air circulation consistent with fresh air requirements, can cause such excessive losses that discomfort results.

A common misconception is that since a large portion of the heat transfer from a panel into a room is radiation (ceilings 70 per cent radiation, 30 per cent convection; walls 56 per cent r., 44 percent c.; floors 50 per cent r., 50 per cent c.), the occupant will be kept comfortable by radiation although a large amount of heat is removed by ventilation. All heat losses still have to be made up by the panel, and when excessive quantities of heat are taken from the air, the panel area required to make up the heat — in the percentages listed — may be either unavailable or impractical.

When the ventilation rate is likely to exceed three air changes an hour, the design should be checked carefully to make certain that the heat from the panel is sufficient to take care of the total loss. A low rate of heat output is characteristic of radiant heating panels because of the limitation on panel surface temperatures — to keep them within a comfortable range — and due to the lack of much air movement across the panel. Standard ratings are approximately:

<table>
<thead>
<tr>
<th>Panel Location</th>
<th>Surface Temp., F</th>
<th>Heat Output, Btu/hr./sq. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling</td>
<td>120</td>
<td>84</td>
</tr>
<tr>
<td>Wall</td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>Floor</td>
<td>85</td>
<td>40</td>
</tr>
</tbody>
</table>

The problem of not having enough panel area is hardly ever encountered in houses, where ventilation rate is about one air change an hour, but may occur frequently in garages, warehouses and offices. Oftentimes in buildings like garages, methods must be devised to prevent infiltration — for instance, locating doors away from prevailing winds or in shielded spots. If this is not possible, then convector may have to be installed so as to form a curtain of warm air across doorways that are frequently left open. In installations such as offices where people are located close together and forced ventilation is employed to remove stale air, it is advisable to temper the air when there are more than three air changes per hour.

The effect of excessive ventilation is best demonstrated by the following

* Product Engineering Dept., National Tube Co. Ill. S. Steel Corp. subsidiary, Pittsburgh, Pa.
† Associate Editor, ARCHITECTURAL RECORD.

1 Recommended surface temperatures: floor 85 F., wall 100 F., ceiling 110 F. at 8 ft., 120 F. at 9 ft. and over.

Effect of varying pipe depth in floor slabs is shown here. Heat output was assumed to equal the heat input at 12 o'clock; then the temperature was increased in pipe. Clocks indicate time when slab surfaces come up to a higher, constant temperature.
examples. In some cases the panel temperatures required to get sufficient heat output would make occupants uncomfortable. In other cases where the panel temperature is kept within bounds, the panel area needed to get sufficient heat is more than that available. The "impossible" conditions are indicated by bold face type.

**Example:**

Room 10 by 20 by 8 ft. (clg.). Outside temperature designed for 0 F.

A. The entire floor (200 sq. ft.) is assumed as total available panel area; ventilation rate equals 2.8 air changes per hour.

In cases 2 and 3 the panel temperature

would cause discomfort; in cases 5, 6 and 7 the panel area required to give sufficient heat output is larger than that available. In case 8 the panel area is close enough to that required, but the panel temperature exceeds that recommended for an 8 ft. ceiling.

It is true that heat loss due to ventilation is less with radiant heating because of the lower air temperature inherent with the system; and consequently less fuel is required to maintain comfort. It is not true, as can be seen from the foregoing examples, that a large ventilation rate poses no problem for radiant heating design.

**RESPONSE TO CHANGING HEATING LOAD**

Another prime requisite for a radiant heating system is that the surface temperature of the panel must respond to a change in the heating load — whether it be due to outside air temperature, wind velocity or solar radiation — so as to maintain always a comfortable environment. The rate at which the panel temperature has to respond depends on how fast heat is conducted through walls, roofs, floors; how large the glass areas are; and how much ventilation is introduced. For example, heavy masonry walls delay the effect of outside air temperature and absorbed solar heat on inside conditions. At the other extreme, changes in the amount of solar radiation transmitted through large glass areas and the effect of changes in the amount and temperature of ventilation are felt immediately. A proper evaluation of these will determine just how much time can be allowed for the panel surface temperature to change following a change in weather. Failure to do this often results in under- and overheating, especially in the spring and fall.

What determines how fast a panel will respond? There are two things to consider — the depth of the pipe coils (or warm air ducts) from the panel surface and the conductivity of the intervening material. Most panels are constructed with a cover of plaster or concrete which have high enough conductivity; of course no insulating plaster or concrete ever should be placed between the pipe and panel surface. When the coils are buried too deep in concrete, the panel response will be sluggish. When there is a demand for more heat from a panel, following a condition where heat input was equal to heat output, the surface temperature cannot change until every particle between the heating medium (pipe coils) and the surface has risen in temperature. Even if the water temperature is set in accordance with the outside air temperature, this still cannot offset panel sluggishness, or lag, as it is called. This is clearly demonstrated in Fig. 1 where the heat output was assumed to equal the heat input at 12 o'clock; at this time there was a demand for more heat and the heat input in the pipe coils was increased. The clocks show the time at which the surface temperature comes up to a higher, constant value. (Heat output again equals heat input.) Where the coils were buried 1 in. in a 3.3 in. slab it took a half hour for the surface temperature to respond to the increased input; and in the worst case, coils buried 4 in. in 8.65 in. slab, it took nearly three hours and a half.

**Controls**

Since the function of a thermostat is to "request" heat from the panel until comfort conditions are met, the effec-

*UX area of heated room surfaces X temperature difference between inside and outside on = heat loss by conduction.
Surface temperature of an actual radiant heating panel varies, as shown here, both parallel to and in between the pipe coils.


tiveness of different arrangements should be examined. Under conditions of ideal comfort in radiant heating, the inside air temperature decreases as the outside air temperature decreases. This is because the additional heat loss is made up in great part by radiation, instead of the mass of air alone being heated. This suggests the need for a thermostat that would be reset in accordance with outside temperatures. It can be shown, however, that the inside temperature variation would rarely be more than two degrees during a daily heating period, which is really inconsequential; therefore, a control device set at a constant inside air temperature will suffice for most installations.

Modulating and on-off controls used with hot water radiant systems operate just as their names imply. With the modulating control, either the supply and return lines are mixed in a proportion so as to meet the heating demand or else the fuel supply is modulated, for instance operating one or several burners according to the heating load.

With an on-off system (assuming continuous pump operation), the additional heat required is supplied at full capacity. The only difference between the two systems is that the panel surface temperature would fluctuate to a lesser degree with the modulating system than with the on-off control. As can be seen from Fig. 2, the panel temperature variation with the on-off control is quite small; so it is a question of whether the improved performance is worth the added cost. The modulating system chosen for comparison with the on-off control sets the boiler water temperature according to the outside air temperature and then resets the temperature of the water going to the panels by means of a modulating inside air thermostat.

Pump Operation

It is recommended that the pump operate continuously. If it operates periodically, there will be added difficulties in the control of the system. For example, when the inside air thermostat responds to a drop in temperature and actuates the pump, heat is supplied until the air temperature is brought back to the value set by the thermostat, and then, in addition, stored heat in the panel pushes the air temperature and panel surface temperature beyond that desired. If the pump operates continuously there is never a period of sudden temperature change to hinder response of the system.

Uniformity of Panel Surface Temperature

The degree of panel surface temperature uniformity that is possible is governed by allowable expense and the rate at which a panel has to respond to changing heating load. A hot water panel as is shown in Fig. 3 will be taken, as an example in illustrating the variations that exist. It is evident that there is a temperature variation in a direction parallel to the pipe and in between (or at right angles) to the pipe, the latter variation being by far the greatest.

The parallel variation can only be reduced by increasing the flow rate; and then the flow rate must be doubled to reduce the variation by one half, and this is usually prohibitive. The most important variation, that in between the pipes, can be reduced by (1) increasing the "cover" (plaster or concrete) over the coil or (2) decreasing the pipe spacing. Of these two means, the second is the best since the response of the panel

(Continued on page 176)

Detail of floor slab radiant heating designed to minimize back-side heat losses
From time immemorial man has tried to find new ways to utilize the heat energy of the sun directly, without waiting a few thousand years for it to be transformed into burnable fuel. This house, in the Boston area, represents one of the most recent solar experiments. It incorporates the ideas of Dr. Maria Telkes of the Department of Metallurgy of M.I.T., but is sponsored by Miss Amelia Peabody as a private project.

It is not a solar house as the term has been used commonly in recent years to describe a house with large windows. It is the genuine article—a house depending entirely on the sun for space heating. As such it is bound to be watched closely, not only to see how man’s efforts in this general direction are coming, but also to see whether the particular method of heat storage which is used will win out.

The heating system consists of a huge solar heat collector, air ducts to convey the heat, and “heat bins” filled with chemical for storing the heat, from which it is distributed to the rooms as needed.

The heat collector, running the full length of the house, consists of double sheets of glass 10 ft. high with air spaces between, backed by a thin metal sheet to trap the heat. Behind the sheet, enclosed with a well-insulated wall, is an air space forming a duct. The air heated by the metal sheet is circulated by fans to the heat bins located on the first floor.

Each heat bin serves to heat the two rooms which adjoin it, except one which heats only the living room. There is a wall register in every room with a thermostatically controlled fan to convey warm air into the room. The cold air is drawn back into the heat bin through a return-air register. A small amount of heat is freely transmitted into the rooms from the walls of the heat bins as radiant heat, enough to keep the rooms warm on milder days. Thus convected and radiant heat are combined.

The test feature of this system is the method of storing the heat. Each heat bin is simply a small warehouse filled with metal drums of a sodium compound whose properties for absorbing and giving off heat are under test. The warm air circulated between the metal drums melts the chemical, which enables it to store heat at a constant temperature. When the heat is drawn out, the chemical re-crystalizes, returning the absorbed heat to the air. This is the “heat of fusion” method of storing solar heat.

The heating system is so designed that the heat it obtains from the sun in December, January and February is equal to the heat needed during these months.
Right. Massachusetts Institute of Technology has just announced the completion of its own sun-heated house as part of its continuing research in this field. The heating system, using water as the medium, consists of roof collectors, attic storage tank, radiant ceiling, panel units, pumps and controls. Further details will appear in the April issue.

to maintain the standard 70 degrees F. inside the house even if the temperature is zero outside. Naturally allowance has to be made for a succession of sunless days. An analysis of the sunshine records of the nearby Blue Hills Observatory shows that a heat storage capacity for ten average winter days will be sufficient to assure an adequate supply of heat for any number of consecutive sunless days statistics have shown to be probable.

The heat collected by the heating system in this sun-heated house on an average winter day is equal to the heat obtained by burning 70 pounds of coal; on a clear winter day it may equal 140 pounds of coal. The house is naturally well insulated to diminish heat losses. Boston, or places of similar sunshine and temperature conditions, appears to be the northern limit for the practical working of this system. In less severe climates the size of the collector and the heat storage bins can be made smaller, with fewer restrictions on the size of the house.

The method of solar heating used in this house was developed by Dr. Maria Telkes. Dr. Telkes will live in the house this winter and will continue the tests and the collection of data on solar heating which she has been conducting for some time.

The house was designed by Eleanor Raymond, a Boston architect. Miss Raymond had to meet the problem of designing a liveable house within the restrictions imposed by the heating system. The heat collector had to face south and had to be large enough to collect the required heat for this particular house in this climate. This meant that an area equal to the entire south wall had to be given over to the heat collector. But as there must also be sunlight in the living space, that is, windows, the problem was solved by moving the collector up to become the south wall of an attic. The space in this attic story can not be heated but serves the purposes of both attic and cellar (the house is built on an insulated concrete slab). Further south, where a smaller collector could be used, greater flexibility in the design of the house would be possible. Affecting the design of the house too was

A fan in the wall between a bedroom and the heat bin supplied heat to the room under the dictates of a thermostat. Note that the bedroom ceiling has aluminum reflective insulation

This closet full of "insecticide" (it says on the cans) becomes the "heater room". It is one of three "heat bins" in which solar heat is stored by the heat-of-fusion method in a sodium compound. The metal plate is a baffle to guide heated air in a longer route. Right-hand picture shows duct work behind the heat collector plate.

the fact that for the Boston climate 4 linear ft. of the collecting glass will produce only enough heat to serve a space 4 ft. wide by about 17 ft. deep. This meant that the house could be only one room deep. Although the house has a fireplace, this is solely an aesthetic feature and is not depended on for the production of heat.

Exact accounts of the costs of this solar system are being kept so that comparison may be made with the cost of conventional fuel-burning systems.
MODULAR DESIGN DATA FOR WOOD WINDOWS

(Continued on page 143)

MODULAR wood window sizes listed on the Time-Saver pages that follow are those adopted as industry standard by the National Door Manufacturers Association. The standardization of these sizes substitutes one national-wide standard for ten different market practices — allowances of wood over glass; Ponderosa Pine stock windows are widely produced in accordance with the sizes. The window opening sizes established were designed to meet the basic requirements of the American Standards Association Project A62*. The basis for coordination of the window sizes with other building products is the 4 in. module or increment. The window sizes are coordinated by determining, through a study of modular installation details, one size that works well for a certain type. Other sizes for that type must then be equal in width and height to the first size plus or minus some 4 in. multiple. This does not necessarily mean that the window dimensions have to be in 4 in. multiples. The window sizes listed here-with have widths in multiples of 4 in. and heights in multiples of 4 in. plus 2 in. These sizes were selected because they included a maximum number of present stock windows.

Coordination of windows is simplified a great deal by consistent referencing to grid openings. The position on the grid for the edges of wall openings may differ considerably for various types of construction. Thus it is useful to identify the lines which are used for layout and referencing on the grid as the grid opening. As a result of referencing modular wall and window details to the same grid opening, many combinations are indicated by a small number of drawings.

Windows are placed in a symmetrical grid position horizontally so that modular details are the same at each jamb. This does not apply vertically because the head and sill details are essentially different. The usual space between the window and grid opening is 2 in. at the jamb and 2 3/16 in. at the head. The sill space varies, depending on whether the construction is modular masonry, custom masonry, wood frame, etc.; 4 in. is sufficient to include all wood sill details. It is desirable to have a size of grid opening for each window size that will apply to any sill. A symmetrical grid position for walls simplifies dimensioning, estimating, quantity take-offs and the determination of actual dimensions when needed. It also reduces the variety of lengths for frame members and other parts.

The only inconsistency with the modular program arises in the case of multiple window openings in masonry walls. If all mullions were made 4 in. wide, there would be no complication in any case. But Mullions are 6 in. wide for conventional weight-type balances and need be no more than 2 in. for the streamlined mullions used with patent balances. Thus when 2 or 6 in. Mullions are used, there have to be an even number, or else a 2 in. masonry offset will be required at one jamb. In brick walls this is done by either cutting the brick at one jamb or providing three-quarter length brick. In cement block walls built with standard 16 in. nominal length units, the offset cannot be produced, so either an even number of Mullions must be used, or for patent balances a 4 in. auxiliary Mullion can be employed.

*Project A62 for Coordination of Dimensions of Building Materials and Equipment, jointly sponsored by AIA and The Producers Council, Inc.
WELDING GUN ATTACHES CORRUGATED ASBESTOS TO STRUCTURE

Application of corrugated sheet asbestos (Transite) with the lightweight, automatic Nelson stud welding gun is reported to have achieved a distinctive streamlined effect for the exterior of the new two-story carton plant with basement and three-story factory addition to the Sunshine Biscuit bakery at Dayton, Ohio.

Studs end-welded to the Z-bars with the Nelson gun secured the siding to the struts, making it possible for installation of all sidewall materials to be handled from the outside and eliminating exposed fasteners or clips on the inside.

One-inch panels of insulating board (Transitop) surfaced on the inside with ¼-in. veneer (Flexboard) were used for insulation. Around the inside, the outside and the bottom of these insulating panels, where they were set into a layer of caulking putty, were wrapped sheets of 15-lb. asbestos felt in a U-shape.

On the outside, in the same bed of putty, the corrugated asbestos sheets were then placed, and holes were drilled at regular intervals to facilitate installation of the Nelson studs, which extend through the siding and insulating board to the structural supports.

To provide uniform weather protection and an even surface overall, corrugated back batten strips were installed at joints. Nelson Stud-Welding Division, Morton-Gregory Corp., Lorain, Ohio.

HEATING CONTROL SET AT TIME BUILDING IS TO BE WARM

Now in production is a weather-actuated regulator for building heating designed to set back inside temperatures at night and still insure adequate warmth in the morning, regardless of outside temperature change.

The Weather-Chron, wired into the regular room thermostat circuit like any other clock switch, is set, not for the time heating is to start, but to the time the building is to be warm every morning.

According to the manufacturer, Weather-Chron automatically changes the time heating starts with the changes in weather. On the coldest nights, when outdoor temperatures drop below a preselected level, the device is reported to hold building temperatures at daytime level throughout the night. When outdoor temperatures rise above 65 F., heating is eliminated.

Daytime building temperatures are maintained by the regular room thermostat at comfort level. Automatic Devices Co., 53 W. Jackson Blvd., Chicago 4, Ill.

(Continued on page 180)
Insulation
Silvercole’s Handbook of “U” Values. Lists large number of heat transmission coefficients (“U” values) for various types of wall, floor and ceiling construction, including the coefficients for constructions using six different types of reflector insulation made by Silvercole.

A unique feature of the booklet, according to the manufacturer, is that it lists both winter and summer insulation values. The coefficients are reported to have been calculated in accordance with FHA procedure. The manufacturer’s reflector insulations are described; three of these are thin sheet types and the others are of the blanket type. 108 pp., illus. Silvercole Products, Inc., 161 E. Erie St., Chicago, Ill.

Heating System Controls
Sarcoltherm Weather Control for Hot Water and Radiant Heating (Technical Bulletin No. 1). This is the first in a series of bulletins designed to assist architects and engineers in the selection of appropriate controls for radiant heating systems. Includes descriptions and wiring diagrams of new thermostats developed especially for radiant heating.

8 pp., illus. Sarcoltherm Controls, Inc., Empire State Bldg., New York 1, N. Y.

- (1) Electronic Moduflow; (2) Zone Control and Individual Room Control. The first booklet describes a “super-sensitive” electronic control system designed to vary the length of the “on” and “off” periods of the burner in direct proportion to the heating load. Components of the system and typical applications are illustrated and described. Diagrams are included for gravity and forced warm air and warm water, steam and radiant panel systems. The second booklet tells how zone or individual room control is accomplished for forced warm air and hot water and radiant panel applications. 8 pp. each, illus. Minneapolis Honeywell, Minneapolis 8, Minn.

Carpet Anchoring Device
Smoothedge Carpet Gripper. Describes method for installing wall-to-wall carpeting without the use of tacks. Narrow strips of plywood containing two rows of pins set at a 60° angle are installed level with the padding at the edge of the carpet. The pins penetrate the warp of the carpet to hold it rigidly in place. Sketches show how the strips are installed for both rolled and sealed edge finishes, and how they can be used for both wood and concrete floors. 4 pp., illus. The Roberts Co., 1536 N. Indiana St., Los Angeles 33, Calif.a

Incinerators
Incinerators: The Proper Type for Each Purpose. Covers complete line of flue-fed incinerators for residential, industrial and municipal use. Models are shown for installation in basements of residences and for multiple floor installation in apartments, hospitals, hotels and schools. The heavy-duty types are available in capacities ranging from 50 lb. per hr. to 100 tons per day. Specifications and detailed drawings are included.

8 pp., illus. Morse Bouger Destructor Co., 205-A 42nd St., New York 17, N. Y.

Wood-Plastic Material
Weldwood Catalogue. Newly issued catalogue on Weldwood products lists and illustrates new items in the line such as fire-resistant doors, Planktweld, Weldwood mouldings, several new wood species — Korim, American Elm and Vertical Grain Cedar, and two new finishing materials. 32 pp., illus. United States Plywood Corp., Weldwood Bldg., 55 W. 44th St., New York 16, N. Y.

Plaster
Ohio Autoclaved Finishing Hydrated Lime. Pamphlet points out special features of autoclaved hydrated lime which is reported to need no soaking and to have greater yield than ordinary hydrated limes. Preparation instructions are given. 4 pp. The Ohio Hydrate and Supply Co., Woodville, Ohio.

Toilet Compartments
Sanymetal Toilet Compartments. (Catalog No. 68.) Five types of toilet compartments are illustrated — overhead braced, ceiling hung, floor supported, standard flush type and standard panel type. A color chart shows the 21 different shades available for porcelain and baked-on enamel over steel. Other products catalogued are hospital cubicles, shower cabinets, dressing room compartments and hardware. Advantages are listed and extensive construction details and specifications are given. 20 pp., illus. The Sanymetal Products Co., Inc., 1701 Urbana Rd., Cleveland 12, Ohio.

Hospital Communication
Auth Hospital Bulletin No. 170. Typical specifications and wiring diagrams on such hospital and institutional equipment as call systems, paging systems, emergency alarms, and inter-communicating telephone systems. Two pages are devoted to architects’ symbols. 18 pp., illus. Auth Electric Co., 34–20 45th St., Long Island City 1, N. Y.

Wall, Ceiling Panels
New Interiors for Old. A collection of 79 repair and remodeling ideas using Upson wall and ceiling panels. Besides containing suggestions on how to cover cracked plaster with Upson materials, the booklet is profusely illustrated with pictures showing color schemes in rooms where Upson wall and ceiling panels have been applied. Color suggestions are given for predominant, secondary and accent colors. The various types of panels available are described and dimensions given. Diagrams show a variety of ceiling and sidewall panel designs. Accessories such as fasteners, mouldings and ornaments are included. 32 pp., illus. The Upson Co., Lockport, N. Y. 25 cents.

Wood
Douglas Fir of the Western Pine Region. Booklet on properties, uses and grades of Douglas Fir. General information provided covers appearance, weight, working stresses, shrinkage, nail holding power, ease of working, ability to take finishes, preservation and gluing. Other sections describe and picture various residential, commercial and heavy construction uses. The different grades available are shown with full page pictures accompanied by a description of the material and a general outline of grading rules. 52 pp., illus. Western Pine Assn., Yeon Bldg., Portland 4, Ore.

Typical Designs of Timber Structures. This book, prepared especially for use by architects and engineers, contains 88 new, typical designs and valuable technical information. Modern methods of timber construction using Tejo (Continued on page 198)

a Other product information is Sweet’s File, 1949.
Here is FISSURETONE

FISSURED MINERAL FIBRE TILE

- Developed and produced by the world's largest manufacturer of Sound Conditioning products, FISSURETONE brings architects and designers an entirely new acoustical medium, perfectly suited for any type of public or private, commercial or domestic building.

**Highly sound absorbent**, this completely and totally new mineral fibre tile is both smart and dignified in appearance. The beautiful fissured surface rivals the finest travertine and is factory-finished in a soft, flat white of high light-reflection rating. FISSURETONE has the paintability and cleanability inherent to products of this type.

FISSURETONE is lightweight, rigid and incombustible. Its safety, effectiveness and unusual beauty make FISSURETONE equally suitable for both traditional and modern interiors.

**Now—architects who want something really “different”** can design dignified quiet into any room, right along with attractive style and perfect taste. Both functional and decorative, FISSURETONE again marks the consistent leadership of Celotex, creator and producer of the most wanted, needed and widely accepted line of Sound Conditioning products.

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FISSURETONE’S new and “different” random-fissured surface gives a beautiful new pattern and style to Sound Conditioned ceilings.
Heating the mammoth General Electric flight test hangar at Schenectady, N. Y., presented—as it always does in buildings of this type—the serious problem of how to maintain reasonably uniform temperatures despite very high ceilings and frequent air changes due to the opening and closing of hangar doors.

Consulting Engineer J. L. Ottenheimer solved the problem by specifying a radiant heating system installed in the concrete floor to maintain a comfortable temperature which is recovered unusually fast after hangar doors have been open. In spite of the 45-foot ceiling, a breathline temperature of only 60°F has proved comfortable, and ceiling temperature is actually 2°F lower, representing a considerable saving in fuel.

Two H. B. Smith No. 440 cast-iron sectional boilers heat the radiant floor panels in a manner which engineers have come to expect from these proved and tested Smith products. Their efficiency with heavy-oil, flexibility, and economy contribute much to any heating system. Their negligible maintenance costs, easy installation, and long-life expectancy should be considered no matter what the size of the job.

H. B. Smith boilers are being selected more and more for the difficult heating jobs where only the best equipment will do.
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<td>3-10</td>
<td>20</td>
<td>20 x 5 1/2</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>4-6</td>
<td>24</td>
<td>24 x 4 1/2</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>4-10</td>
<td>26</td>
<td>26 x 4 1/2</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>5-2</td>
<td>28</td>
<td>28 x 4 1/2</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>3-4 x 4-6</td>
<td>36 x 24</td>
<td>36 x 11 1/4</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>4-10</td>
<td>26</td>
<td>26 x 12 1/4</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>5-2</td>
<td>28</td>
<td>28 x 12 1/4</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>3-8 x 4-6</td>
<td>40 x 24</td>
<td>40 x 11 1/4</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>5-2</td>
<td>28</td>
<td>28 x 12 1/4</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
</tbody>
</table>

Note: The windows on this page are made 7/8 in. narrower and 1/4 in. shorter than window opening sizes listed. Dimensions for wood parts such as stiles, muntins, etc., are face measurements.

*Stiles for 16 Lt. sash are 1 29/32 in. Other window parts are the same.
Now you can get "egg crate" fluorescent lighting effect without the egg crate! Corning "Fota-Lite" is a new glass in which vertical louvers are photographically transferred to the full thickness of the glass.

EASY TO CLEAN. "Fota-Lite" presents a smooth surface which you can wipe clean quickly—something that is impossible with ordinary exposed louvers. Since you can completely enclose the fixture, both tubes and reflectors also remain clean. Thus, you never lose original efficiency through the accumulation of grime and dust.

HIGH EFFICIENCY. Brightness at high angles is low. Yet, the transparent area is comparable to the finest crystal. Light directed vertically is almost unrestricted but a slight surface diffusion obscures tubes and reflectors. The 45° cut off is obtained within the thickness of the glass (1/8") instead of bulky and costly louvers.

NO COLOR CHANGE. The opalescent louvers are non-selective in color transmission and as they are sealed within the glass surface, discoloration is impossible. This is important in maintaining original color values.

SEE this sensational new development at the Corning Exhibit, International Lighting Exposition, Booth No. 13, Hotel Stevens, Chicago, March 29 to April 1, or write for further information.

CORNING GLASS WORKS, CORNING, NEW YORK
### MODULAR DESIGN DATA FOR WOOD WINDOWS

Window or sash opening sizes are in bold face type; glass sizes are in ordinary type.

#### CASEMENT SASH, 1½"

<table>
<thead>
<tr>
<th>SASH OPENING</th>
<th>1 Lt.</th>
<th>3 Lt. H.</th>
<th>4 Lights</th>
<th>6 Lt. 2 W.</th>
<th>8 Lights 2 Wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3½ x 3-2</td>
<td>12 x 33</td>
<td>12 x 10½</td>
<td>12 x 10½</td>
<td>5½ x 10½</td>
<td>7½ x 10½</td>
</tr>
<tr>
<td>3-10</td>
<td>41</td>
<td>13½</td>
<td>12½</td>
<td>13½</td>
<td>12½</td>
</tr>
<tr>
<td>4-6</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-7½ x 3-2</td>
<td>16 x 33</td>
<td>16 x 10½</td>
<td>16 x 10½</td>
<td>7½ x 10½</td>
<td>7½ x 10½</td>
</tr>
<tr>
<td>3-10</td>
<td>41</td>
<td>13½</td>
<td>12½</td>
<td>13½</td>
<td>12½</td>
</tr>
<tr>
<td>4-6</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Stiles** . . . . . 1½"  **Bottom Rail** . . . . . 3"  **Muntin** . . . . . ½"  **Top Rail** . . . . . 1½"  **Vertical Bar** . . . . . ¾"  **Mullion** . . . . . ½"

Note: Sash are made ¼" narrower and ½" shorter than opening sizes given above.

#### STORM SASH AND SCREENS 1½"

<table>
<thead>
<tr>
<th>Storm Sash</th>
<th>Screens</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. . . . . 1½&quot;</td>
<td>St. . . . . 1½&quot;</td>
</tr>
<tr>
<td>T.R. . . . . 1½&quot;</td>
<td>T.R. . . . . 1½&quot;</td>
</tr>
<tr>
<td>B.R. . . . . 1½&quot;</td>
<td>B.R. . . . . 1½&quot;</td>
</tr>
<tr>
<td>V.B. . . . . ½&quot;</td>
<td>V.B. . . . . ½&quot;</td>
</tr>
<tr>
<td>Muntin . . . . ½&quot;</td>
<td>Muntin . . . . ½&quot;</td>
</tr>
</tbody>
</table>

Storm Sash and Screens are made ¼" narrower and ½" longer than window opening sizes.

#### CELLAR SASH 1½" AND 1¾"

<table>
<thead>
<tr>
<th>SASH OPENING</th>
<th>2 Lt.</th>
<th>3 Lights</th>
<th>4 Lights</th>
<th>5 Lights</th>
<th>6 Lights</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-0 x 1-4</td>
<td>10 x 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4 x 1-4</td>
<td>12 x 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-8 x 1-4</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-0 x 1-4</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4 x 1-4</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Sash are made ¼" narrower and ½" shorter than opening sizes given above.

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TIME-SAVER STANDARDS  
MARCH 1949  
ARCHITECTURAL RECORD  
ARCHITECTURAL ENGINEERING  
TECHNICAL NEWS AND RESEARCH  
(Continued from page 143)
Building Outlook Bright

Construction industry leaders see a contract award total in 1949 that will about equal last year's record $954 million. But they agree that physical volume may drop as much as 5 to 10 per cent. Building costs, they say, will probably continue to rise slightly during the first six months of the year, then they will level off.

Contractors and suppliers are slowly returning to the practice of quoting firm prices, at least on jobs requiring a short completion time, but a buyers' market seems to be as far away as ever. It is expected that there will be more cement and lumber in 1949, but bottlenecks will remain in the supply of steel pipe, gypsum lath, plasterers and bricklayers.

No decline is anticipated, either in dollar value or in number of units completed, in residential construction. As a matter of fact, there may be an increase in both categories because of the unusually large carryover—55,000 units—from 1948. The volume of engineering works, and commercial and institutional building, is expected to remain unchanged. Industrial building, in keeping with last year's trend, may be down a little.

Hamiltonian New President

Charles Lenz of Hamilton was elected president of the Ontario Association of Architects for 1949 at the annual meeting held in Toronto, January 21-22.

Retiring president L. E. Shore urged Association members to dip into their treasury to build "permanent quarters" in Toronto, with a lecture hall to accommodate from 100 to 150 architectural students. He also suggested that practising architects might give more assistance to architects-in-training by providing them with office experience.

Members were loud in their praise of the work done by the Committee of Arrangements, voted the meeting among the most memorable in the history of the Association. The program ranged from an exhibition of new building materials and tour of current construction projects to panel discussions on topics of architectural interest. Highlight of the annual dinner was an address by Louis Skidmore, senior partner of

(Continued on page 148)
The new name for air conditioning is UniTrane. It's too new for the dictionary—but it does have one important feature in common with the big Merriam-Webster book: both are complete—unabridged.

UniTrane is not merely a new system. It is a new kind of air conditioning. And it deserves a new name: It is a Unit system. It is a Trane system. It is a UniTrane system.

UniTrane air conditioning has individual room temperature control, moisture control, ventilation control. Filtered air. All without ducts.

It is designed for big buildings with small rooms. Office buildings. Hotels. Hospitals.

Type MC UniTrane units have two circuits in one cabinet. One circuit controls ventilation and moisture. The other circuit controls room temperature. The two circuits work together, but they are independently adjustable. There is no other system like it.

And no ducts! Just simple piping, like a hot water heating system. You circulate hot water in winter, chilled water in the summer. It's as simple as that.

Read “Merely a Matter of Air” for non-technical information about UniTrane. See Bulletin DS-420 for professional data. The Trane sales office in your area is ready to tell you many interesting things about UniTrane—Air Conditioning, unabridged.

THE TRANE COMPANY...LA CROSSE, WISCONSIN
Manufacturing Engineers of Heating, Ventilating and Air Conditioning Equipment—
Unit Heaters, Convector-Radiators, Heating and Cooling Coils, Fans, Compressors, Air Conditioners, Unit Ventilators, Special Heat Exchange Equipment, Steam and Hot Water Heating Specialties. IN CANADA, TRANE COMPANY OF CANADA, LTD., TORONTO.
The entire facade of Leighton's new building in Los Angeles, California shows how one of a variety of Seaporcel® "shaped" parts has been applied for esthetic as well as practical value.

**BEARING IN MIND** the ease of installation, the negligible maintenance cost, its strength, long life and beauty of fadeless color (which is almost limitless) and you have the reasons for architects' preference for Seaporcel architectural material in designing store fronts, entire building facades and even interiors.

**EXTRUDED OR REVERSE**, Seaporcel "shaped" or custom fabricated parts are obtainable in such versatile surface textures as "terracotta," "limestone," "granite," in semi-matte, matte or gloss finishes.

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Complete A. F. of L-Metal Fabricating & Enameling Shop
Also manufactured on the West Coast
**SEAPORCEL CORPORATION OF CALIFORNIA**
Represented by Douglas McFarland & Co., 1491 Canal St., Long Beach, Calif.


**NEW YORK ARCHITECT LOUIS SKIDMORE** (left) is presented with an inscribed monel metal memento by L. E. Shore, president of the Ontario Association of Architects, on behalf of the Association at its Toronto meeting. Mr. Skidmore received the honor in recognition of his part in planning important international projects such as the United Nations Center and the Atomic Energy Commission’s Oak Ridge.

Skidmore, Owings and Merrill, who extended fraternal greetings from architects in the U.S.

**FIRST HOME SHOW SCHEDULED**
Canada's first National Home Show will be staged in the Canadian National Exhibition's Horticultural Building, Toronto, May 20-28. It will feature demonstrations of new methods, materials and equipment calculated to produce better, cheaper building. Co-sponsors are the National House Builders' Association and the Toronto Metropolitan Home Builders' Association.

**NEW P.M. SAYS SUBSIDIES OUT**
Pressure for subsidized housing has been mounting. It is favored by the Canadian Federation of Mayors and Municipalities, the Canadian Construction Association, the Royal Architectural Institute of Canada, the Canadian Welfare Council and many other organizations. However, the Dominion Government appears to have a low estimate of the political potency of (Continued on page 150)
Designed especially for use in metal door and frame construction, the LCN No. 304 Closer is concealed within the door. Requiring only 1¾" in width, it fits easily into a 1¾" door prepared by the fabricator, and is secured by machine screws. The arm connects with a soffit plate in the head frame, where a three-point mounting allows for adjustment to local conditions.

In This "Lab" Everything Has to be Right
So the Steel Partition Doors Have LCN Concealed Closers

- Modern from top to bottom is the new Whiting Research Laboratory, designed for Standard Oil Company of Indiana by Holabird & Root & Burgee, Architects.

The movable steel walls, fabricated by The E. F. Hauserman Co., have hollow metal doors equipped with LCN No. 304 Closers Concealed-in-door. The powerful mechanism of this closer is entirely hidden in the door itself, and with its unobtrusive lever arm will handle easily any metal interior swing door up to 3'6" x 7' x 1¾" in size, and will operate efficiently under common conditions of internal draft and heavy traffic for which a simple adjustment is provided.

A hold-open feature is available where desired, as an integral part of the closer. Backcheck action (to protect walls and fixtures on the opening swing) is always included.

This is but one of LCN's eleven types of concealed door control based on over twenty years of engineering and manufacture in this special field. LCN Catalog 11-a, almost a manual on the subject, promptly sent on request. LCN Closers, Inc., 466 West Superior Street, Chicago 10, Illinois.
Every architect and builder should have a copy of this brochure. It contains much information on Michaels building products...products that are well known for their unusually high quality. And architects have found that Michaels has the men, the machines, and the know-how to faithfully reproduce in metal their most exacting specifications. A partial list of Michaels stainless steel, aluminum and bronze products is shown below. If your plans call for something special, send us the blueprints. We'll be glad to submit quotations. It will be to your advantage to talk over your requirements with Michaels.

MICHAELS PRODUCTS

Bank Screens and Partitions  
Welded Bronze Doors  
Elevator Doors  
Store Fronts  
Lettering  
Check Desks (standing and wall)  
Lamp Standards  
Marquises  
Tablets and Signs  
Name Plates

Astragals (adjustable)  
Stair Railings (cast and wrought)  
Wrought and Cast Radiator Grilles  
Grilles and Wickets  
Kick and Push Plates  
Push Bars  
Cast Thresholds  
Extruded Thresholds  
MI-CO Parking Meters  
Museum Trophy Cases

The MICHAELS ART BRONZE Co., Inc., 234 Scott St., Covington, Ky.

Representatives Wanted

NEWS FROM CANADA

(Continued from page 148)

despite pressure from the veterans' housing program carried on by Central Mortgage and Housing Corporation, it has disregarded the subsidy plea.

Public housers were not hopeful of a change in attitude when Louis St. Laurent sat down in the chair so long warmed by Mr. William Lyon Mackenzie King. (Mr. St. Laurent once declared that no government of which he was a member would ever subsidize housing.) It turns out they were right. At a recent press conference, the new Prime Minister expressed belief that lack of money was not holding back building. Since all possible manpower and material was going into it, government subsidies were not needed to sustain housing construction.

This, of course, is not the housers' argument at all. They don't say subsidies are needed to sustain housing construction. They say they are needed to enable low-income families to occupy a percentage of the housing built. Misinterpretation of their object, though perhaps unintentional, drives them to distraction. One protests, "It seems obvious that the concept of subsidized low-rental housing is not well understood...on the part of the new Prime Minister."

Building Costs Level Off

"The most encouraging sign in the construction cost field in 1948 is the leveling off of the marked price increases of 1946 and 1947," Central Mortgage and Housing Corporation reports in the latest issue of Housing in Canada, a quarterly review of major trends in the shelter field.

Attributed to a more moderate rise of material prices in 1948 as compared with the very rapid increase of the previous year, the combined index of building material wholesale prices and wage rates in construction trades increased only 7 per cent from January to September of 1948 as compared to a 17 per cent increase in the first nine months of 1947. The 1948 increase is made up of a 6 per cent rise in the composite index of building material wholesale prices and a 9 per cent gain in the index of average hourly wage rates (including holiday pay allowances) paid to building workers.

(Continued on page 152)
FREE!

New Booklet to help you sell more (and better)

SCHOOL LIGHTING

16 pages of facts and photos

FREE... all the copies you need

Here's a real selling tool... an easy-to-understand booklet that points out the need for better school lighting—then shows what steps can be taken to get a school lighting program started.

Put this booklet to work for you. Send it to educators, parents, PTA members—all the many hard-to-reach people who must support a school lighting program. Not fixture advertising! This is an understandable, objective case history of a planned school lighting program that will help overcome that "What can we do about it" public indifference. Let it help you SELL school lighting... the need for it... how to get it.

Authoritative because it's an actual account of how the citizens of Denver, Colorado, completely relighted their Public School buildings. Fact-filled—step-by-step through the Denver story—answers such questions as:

- What's a good way to get started?
- Who can help?
- What is the best lighting layout?
- How does color of paint affect lighting?
- What about new wiring?
- What about maintenance?

... and many, many others.

... as many copies as you need... courtesy of Day-Brite! Clip and mail coupon—TODAY!

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Please send me, free and postage prepaid, ___ copies of your new booklet, "It Happened in Denver's Schools." I understand there's no obligation.

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City __________________________ State ______

IT'S EASY TO SEE WHEN IT'S

DAY-BRITE Lighting

Day-Brite fluorescent fixtures are engineered for every seeing task. Distributed nationally by leading electrical suppliers.
Stop Hidden with RUST

Tough, elastic, enduring—Rust-Oleum defies rust-producing conditions years longer—protects the structural strength of steel.

Industry-proved Coating Rustproofs Metal Against Moisture Damage in Sealed Spaces

For structural protection, specify the use of Rust-Oleum on all iron and steel — particularly in inaccessible areas where condensation causes rust. Rust-Oleum positively stops rust and adds years of life to structural members, pipes, sheet metal, etc. which are difficult or impossible to reach in normal maintenance.

Indoors or out — Rust-Oleum seals metal with a tough, pliable, destruction-proof coating. Originally developed to resist the highly corrosive effects of salt water and salt air, under tough sea-faring conditions, Rust-Oleum gives lasting protection where ordinary materials fail. It's your best answer to all rust problems.

We will gladly offer specific recommendations on Rust-Oleum application and uses, if you will give us full information as to technical requirements. See the complete Rust-Oleum catalog in Sweet's, or write for a copy.

PERSONAL—Do you have a rust problem? We'll be glad to send a free sample for a test application on your car or at home. Be sure to state color preference.

RUST-OLEUM CORPORATION

2479 Oakton Street
Evanston, Illinois

NEWS FROM CANADA

(Continued from page 150)

Planners Hear Detroit Expert

That able fledgling, the Institute of Professional Town Planners, held its annual meeting on January 28 in Toronto. Two principal subjects were dealt with: the planning accomplishments of the past five years and the methods to be employed in solving problems that remain.

George F. Emery, Director of the Detroit Planning Commission, was guest speaker at the luncheon session. He told delegates how the one and one third billion dollar Detroit plan would be implemented. The plan provides for a new civic center, riverfront development, improved cultural, educational and recreational facilities, more efficient transportation, slum clearance and public housing. "The citizens can have all this," Mr. Emery declared, "without adding more to their tax bills than they annually spend on movies."

Completion Time Stands Still

The Dominion Bureau of Statistics reports that 68,103 dwelling units were completed in Canada in the first 11 months of 1948. Those finished in November took an average of 6.0 months to build, a figure showing practically no change from October's 6.1 months.

Report on Building Research

A year-end summary of the work of the National Research Council pays tribute to the Division of Building Research. The Division has, it appears, continued its close cooperation with Central Mortgage and Housing Corporation. Joint studies have been made of such problems as paint deterioration and basementless houses, and a long-term study of mortar deterioration is about to be launched. The first of a series of technical reports — a directory of commercial testing laboratories — has been prepared and published.

The construction industry is particularly interested in the work done by the section of the Division dealing with codes and specifications. Worthwhile results are expected from a meeting of municipal officials held in Ottawa, February 28—March 1. The meeting aimed at full discussion of existing building codes with reference to the start of further work on the National Building Code. The Code, which appeared in
THESE CURTIS "READY-MADES" help you whittle down BUILDING COSTS

When stock design woodwork achieves custom-built distinction—at lower cost—that's news for today's home planners and home builders! And that's why Curtis Woodwork is used so extensively in giving home-owners "more for their money."

For Curtis Woodwork makes excellent design and quality construction available for any size or type of home. Here are a few reasons why:

You can give any room the proper focus without expensive special millwork. This Curtis mantel, for example—Design C-6040—has a pleasing simplicity which gives it dignity and beauty. Designed for Curtis by Cameron Clark, Architect.

You can see the sure touch of a master designer in this charming Curtis entrance—Design C-1750. H. Roy Kelley, Architect. Curtis entrances assure lasting value and beauty.

A fine cabinet for the home owner who wants something out of the ordinary—Curtis Design C-6515. The Architect was Russell F. Whitehead. Curtis offers 18 styles of cabinets.

A NEW Curtis Development—PRESPINE

Developed after years of research and testing, Curtis Prespine is a new wood material for use in panels in Curtis doors and as an integral part of other Curtis Woodwork. Prespine has a hard, satin-smooth surface that takes paint and other finishes beautifully. Tough and durable, Prespine will not warp, check or splinter. It is 93% wood—and resembles in color the species wood from which it is made. Picture on right shows the beauty of Curtis doors with Prespine panels.

MAIL COUPON for complete information

CURTIS COMPANIES SERVICE BUREAU
AR-3W Curtis Building, Clinton, Iowa

Gentlemen: Please send me your book on Curtis Stock Architectural Woodwork.

Name.

Address.

City.

State.


When in New York, visit the Curtis Woodwork Display at Architects' Samples Corporation, 101 Park Avenue.
Only Wing Revolving Heaters Circulate the Heated Air Around Obstructions

As the air from roof or ceiling areas is passed through the heating element of a Wing Revolving Unit Heater and projected downward through discharge outlets that slowly revolve, the heated air is not delivered to the working area in single-direction blasts, but in moving air-streams that sweep slowly through 360 degrees, covering successively every direction. The heated air moves around and under obstructions reaching to walls and remote corners. Every part of the plant is thus kept at an invigorating comfortable temperature.

L. J. Wing Mfg. Co. 151 W. 14th St., New York 11, N. Y.
Factories: Newark, N. J. and Montreal, Canada

NEWS FROM CANADA

(Continued from page 152)

1941, has not had the recognition and application originally hoped for.

$670 Million since 1927

In an introduction to the 1949 edition of the Book of Homes, a Maclean-Hunter publication, D. B. Mansur, president of Central Mortgage and Housing Corporation, states that the outlay of federal funds and guarantees for housing has reached a figure in the neighborhood of $670 million. Since the Canadian Farm Loans Act was passed in 1927, the Dominion Government has contributed financial assistance or taken a direct part in the construction of more than 150,000 dwelling units. The greatest volume of government assistance was funneled through the Dominion Housing Act and the two National Housing Acts which superseded this legislation.

The figure of $670 million may seem to be a staggering amount. Actually, it is little more than the anticipated budgetary surplus rolled up by Canadian taxpayers for the Dominion Government in 1948.

Growing Pains in Edmonton

Edmonton, Alberta, faces one of the most serious housing crises in its history. The population has mushroomed, largely because of the sensational oil discoveries in the province. The house production target for 1949 is 3000 units, 1000 more than was aimed at previously. It is proposed that 400 of these be built according to a plan for small, basementless houses developed by the Edmonton House Builders' Association. Available in three sizes — one, two and three bedrooms — and seven different exterior designs, these dwellings would meet local and national minimum building standards and require a down payment of only $700 or $800. The plan has been submitted to Central Mortgage and Housing Corporation for approval under the National Housing Act. Ways of restricting sales to Edmontonians with monthly incomes of less than $200 are being reviewed.

Rental Ceiling Gets Boost

Central Mortgage and Housing Corporation announces that the ceiling on rentals for completely serviced dwelling units covered by rental insurance

(Continued on page 156)
Close-up of the Empire Savings facade shows effective use of bronze against background of black Italian marble. Heavy outer doors are made of cast panels framed in Anaconda Extruded Bronze. Grille above is fabricated from red brass sheet, rod and tubes. The street windows, presenting dioramas of the Old West, are also framed in Anaconda Bronze.

Private office partitions at Empire Savings are formed of glass panels supported by Architectural Bronze frames.

THE OLD WEST GOES MODERN

IN TIMELESS Bronze

Scenes of the West in its wild and wooly days provide the motif for the ultra modern decor of Denver's new Empire Savings Building.

Architect for the new home of the Empire Savings Building and Loan Association is Roger J. Musick, of Denver. Architectural bronze work was fabricated by the William G. Zimmerman Ornamental Iron Works, also of Denver.

Except for the bronze castings and other materials for color contrast, Mr. Zimmerman employed Anaconda Alloys exclusively—extruded architectural bronze shapes, red brass rod, sheet and tube.

In adding this work to his long list of artistic achievements, Mr. Zimmerman reaffirms his confidence in the uniformity of Anaconda Architectural Bronze in color, texture and physical properties.

ARCHITECTURAL BRONZE

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: Anaconda American Brass Ltd.
New Toronto, Ont.
Gate City Awning Windows permit both the apartment dweller and the hotel guest to "customize" the ventilation to their needs. These windows have twice the ventilating area of ordinary windows. A few easy turns of a handle open them to the exact degree desired.

When open, the sash draw in the fresh outdoor air . . . keep it gently moving at the ceiling . . . cool off stuffy rooms on hot days . . . prevent rain from damaging floors and decoration. Made of wood, these windows are rigid . . . sturdy. They cannot squeak, slam, flutter or rattle—important features which add still further to the comfort of the guest.

Nation-wide installations prove that Gate City Awning Windows meet the requirements of Northern climates as well as those of the South. Vertical weatherstripping is standard; horizontal weatherstripping on order. For further information, see Sweet's, or write to Gate City Sash & Door Co., Dept. R-3, Fort Lauderdale, Fla.

Awning Windows by Gate City


Long Branch, Ont., war memorial: a public library. Murray Brown & Elton, Architects

Kenilworth Hotel
Miami Beach, Florida
Roy F. France & Son Architects

Designed for exterior beauty as well as for indoor comfort, Gate City Awning Windows lend interest to the architectural design of this well known hotel. From the strictly formal pattern made by the closed sash to the distinctive icy effect of the open tiers, the result is always pleasing. Even when the sash are opened their widest, the window space does not resemble a "hole in the wall".

"Tailored" Comfort
for Apartment Houses and Hotels

Has been raised from $80 to $84 per month. This maximum rental has been established for living units comprising 800 sq. ft. and provided with heat, hot and cold water, stove, refrigerator and junior.

The insurance program, introduced last year, guarantees builders of approved rental housing projects sufficient income to look after taxes, debt service, operating expenses, repairs, renewals and replacements. Rental insurance may be purchased for 10, 20 or 30 year periods, with annual premiums of 3/4, 2 and 2 1/2 per cent of the insured rentals.

Loans on insured rental housing projects are made directly by recognized mortgage institutions, and are authorized up to 85 per cent of present costs, as estimated by Central Mortgage. The mortgage repayment period is 20 years, with principal repayments at 2 1/2 per cent per annum. The maximum interest rate is 4 1/4 per cent per annum, calculated semi-annually.

Rental insurance, to quote D. B. Mansur, president of the Corporation, "virtually assures that . . . an investor will never lose his property to a mortgagee, no matter what happens to rental levels." The worst that could happen would be that the owner's equity would bear interest at 2 per cent, with amortization of the mortgage continuing at 2 1/2 per cent.

Despite its advantages, the response of investors and builders to the rental insurance program has been lukewarm. The $4 boost in the rental ceiling may induce more enthusiasm on their part.

Construction Association Meets

Allan C. Ross of Ottawa and Robert Drummond of Toronto were re-elected president and vice president respectively of the Canadian Construction Association at its annual convention in Toronto, January 23-26. T. N. Carter of Toronto was elected honorary secretary and P. G. Wilmot of Montreal honorary treasurer.

The C. C. A. is Canada's leading building organization and its convention deliberations always are of general interest. This year's program proved no exception. Highlights of some of the addresses follow:

1. End of Cost Rise in Sight. "While it would be improper to forecast any substantial drop in costs in 1949, there is reason to hope that, if we continue to make progress in restraining inflationary factors, the cost rise may be halted by the end of the year." — Allan

(Continued on page 158)
The new H-H-M Drive-In Depository is a good example of why bankers and their architects in ever increasing numbers specify Herring-Hall-Marvin protective equipment.

For the banker, this new feature combines faster deposit service (no customer parking problems) with up-to-the-minute protection...bullet-resisting glass, two-way speaking system that permits conversation without exposing the attendant, etc. The specially designed work counter inside puts everything ordinarily needed right at the attendant's fingertips. All weather-exposed metal is stainless steel for lasting beauty with minimum upkeep.

For the architect, it offers greater freedom of design with a choice of installation, flush-to-wall—or projected as shown. It is a compact, complete unit, quickly and easily installed. You simply designate wall opening and a small floor area in your plans; no other provisions are necessary.

We're ready to send specifications and design data on request...today!

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BRANCH OFFICES: In New York, Chicago, Boston, Washington, St. Louis, Atlanta, Houston, Philadelphia, San Francisco, Los Angeles, Detroit, Pittsburgh, Omaha, Minneapolis, Charlotte. OTHER AGENCIES ALL OVER THE WORLD.
C. Ross, President, Canadian Construction Association.

Figures presented to support this prediction showed that the pace at which costs had increased was slowed from 20 per cent in 1947 to approximately 10 per cent in 1948.

2. Industry to Go Underground. "I think that it is in this sphere of activity (the decentralization of war plants) that the construction industry will be called upon to play a major part."
—H. J. Carmichael, Chairman, Canadian Industrial Defence Board.

The Board is working on plans to put the Dominion’s vital factories underground to protect them against atomic attack. Two sites have already been selected and surveyed for certain plants which are "of such strategic importance that their destruction would be disastrous."

3. Shelter Lack Still Apparent. Effective demand as calculated by the number of completed but unsold houses in the major communities of Canada shows little indication that the country faces... a lessening of the need for additional housing. — D. B. Mansur, President, Central Mortgage and Housing Corporation.

Net family formation, including immigration, has kept up with the volume of house building. We have just managed to look after current needs without making much progress on the backlog of demand which accumulated during the war years.

4. Public Works Shelf Exists. "In the years beyond 1949... public investment may have to play a more important part than it did in the last four years."—Hon. R. H. Winters, Minister of Reconstruction and Supply.

A public works shelf consisting of fully-planned projects exceeding $100 million in value has been built up "but much remains to be done. We would like to have a shelf of at least three hundred millions of worthwhile federal projects. If provinces and municipalities would build up a proportionate shelf, this would mean a total of potential public projects of about one billion dollars."

5. Canada Needs More Apprentices. "We have to find ways and means of drawing into the ranks of our workers five times as many boys as we have now. And, after we get them, we have to find ways of training them to be good mechanics more quickly and efficiently than is presently the fashion."—J. M. Pigott, Chairman, C.C.A. Apprenticeship Committee.

An early meeting between employers, representatives of organized labor and appropriate departments of government was advocated to face the problem created by apathy to apprenticeship training. Need for an entirely new approach was indicated.

6. More Steel Unlikely in '49. Our production of steel ingot in 1949 should increase at least 100,000 net tons over 1948’s 3,075,000 total, providing scrap steel continues to flow and there are no major mill breakdowns or strikes. —F. K. Ashbaugh, Dominion Steel Controller.

Canada can hope to import about 800,000 tons of U.S. steel in 1949, about 119,000 less than last year. The deficit will be offset partially by increased imports from Europe. Total steel supply should be about equal to that of last year.
Welded Steel Framework Cuts Cost 50%

By Francis J. Schroedel, President
Schroedel Construction Company, Milwaukee, Wisconsin

Direct savings of 50% over masonry and fire resistive construction are being realized in the erection of four 12-family apartment units, eight 16-family units and one 24-family apartment for the Estabrook project in Shorewood, Wisconsin. These savings result from greatly simplified construction methods using steel members for wall frame and floor joists and are made possible by arc welding.

A modular design using 2-foot increments enables mass production arc welding techniques for fast, low-cost shop fabrication of wall panel members for the first and second floors. Bethlehem open-web expanded-steel studs are welded between a channel cap or girt and a sill plate for both the first and second floor panels. Three-quarter inch channel is added between the studs for horizontal bracing.

During field erection, the wall panels are raised into position, held in place with a simple clamp (Fig. 1) and arc welded with 5/16" diameter "Fleetweld 5" electrode, using 200-amp. engine-driven Lincoln "Shield-Arc" welders. The first floor framing is welded into an integral unit, and a finished concrete floor is later poured to cover the sill plates thus anchoring the building frame in position.

An "I" beam, supported by two outside walls and the center utility room walls, forms the center support for the expanded steel second floor framework. The erection of the second floor panels is then done without the need for any scaffolding.

Exterior walls are finished with masonry, and interior plastering is applied to metal lath. In addition to direct cost savings in the building erection, additional benefits are easier, less costly installation of plumbing, wiring and insulation. The structure is both shrink-proof and verminproof.

Fig. 1. Arc welding steel panels to form the side walls. Panels are made from 4' Bethlehem expanded steel studs.

Fig. 2. Placing second floor pre-fabricated steel wall panels in position. Panels are hoisted and welded in place without use of any scaffolding.

Fig. 3. Framework for one of many multiple family apartments built with all-welded steel construction. The Estabrook Homes project is located in Shorewood, Milwaukee, Wisconsin.

The above is published by The Lincoln Electric Company in the interests of progress. Architects and engineers are invited to write on their letterheads to be placed on mailing list for Structural Welding Studies.

The Lincoln Electric Company, Dept. 151, Cleveland 1, Ohio.

MARCH 1949
funds can be generated to implement school construction on a heavy scale. This increase is expected to become evident as soon as costs actually start to drop.

The FWA Office said this about the progress of school construction over the past 30 years: "If the rate of public school building in the decade of the 1920’s had been continued from 1932 through 1947, we would have today an additional $5.5 billion (in terms of 1947 costs) worth of public school plant. The average annual rate of public school construction in recent years, 1940 through 1947, was little more than a fourth of the average annual accomplishment of the 1920’s."

Summarized in terms of physical space, the present requirements call for construction of some 200,000 additional new elementary and secondary classrooms. This takes into account an anticipated enrollment increase of 6.2 million children seven years from now. This can be worked out with fair accuracy on the basis of known birth rate totals.

Public and private sources are concerned over the problems presented in the education picture. They see competing needs for other types of public works (sewer and water facilities, roads, hospitals and other community building types) taking a highly competitive position in the overall building programs. Intensive home construction activity, commercial and industrial building eat up large amounts of building materials, manpower and contracting and engineering potential.

Value of public school construction put in place in 1948 is measured at $550 million. In terms of physical volume, however, this proves out to be well below the yearly average of the 1920’s and not much more than half the volume of public school plant added in 1939.

Many perfectly adequate school structures were found to be "geographically obsolete" due to extensive migration of workers and their families to new production areas during the war. Still another factor in this has been the reshifting of population accompanying reconversion to a peacetime economy. The shifting pupil loads are creating need for new schools far faster than it can be satisfied.

### ON THE CALENDAR


March 5-indefinite: "Ancient Art of the Near and Middle East," exhibition at the Metropolitan Museum of Art, New York City.


March 14-17: Chicago Technical So-

---

**Not All Pioneers Used Covered Wagons . . .**

SOME, like Bergen Cabinet, used plastics, cold cathode lighting and wood. The picture above shows a recently finished product combining these materials.

Pioneering of this kind (for any other kind) is always a challenge to our skill and know-how in the art of wood fabricating.

So, pitch your best curve on the drawing board — and we’ll catch it! We’ll catch your design idea and translate it into tangible, enduring form.

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For modern housing...

**MASS**—1768 new apartments in the Jacob Riis Houses in New York City... that's mass housing. It is estimated that the Gold Bond Solid Partition System, used throughout, provided over 100 extra apartments.

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**LOW COST**—The Gold Bond Solid Partition System, approved by New York City's Housing Authority, helped the successful bidder figure his costs down to a minimum. These are the Amsterdam Houses in New York—1084 apartments.

**QUALITY**—The number one requirement for Tudor Plaza, Buffalo's newest deluxe cooperative apartment building, was "the very best of materials and construction." Gold Bond Solid Partition System met every requirement!

Gold Bond Solid Partition System

**SAVES**...

Trying to save every possible nickel on a low cost housing project? Or planning the most up-to-date deluxe apartment? In any case, the Gold Bond Solid Partition System saves! Provides about 7% more income-producing, livable space than old type walls (about 4 inches per wall) ... and at no extra cost! And the reduction in dead-load saves additional money!

Combine this system with the Gold Bond Hollow Wall System to provide space for pipes, ducts, etc. The two separate units may be spaced any distance apart to meet specifications... with no ties or bridging. For your next job, check up on Gold Bond Partition Systems. Read about them in Sweet's, or drop us a card for a 15 minute demonstration—without obligation!

You'll build or remodel better with Gold Bond

Over 150 Gold Bond Products including gypsum lath, plaster, lime, wallboards, gypsum sheathing, rock wool insulation, metal lath products and partition systems, wall paint and acoustical materials.
THE RECOR D REPORTS  (Continued from page 160)

cities Conference and 7th Chicago Production Show, Stevens Hotel, Chicago.
March 15-18: 81st Annual Convention of the American Institute of Archi-
tects, Rice Hotel, Houston, Texas.
March 29-April 1: 3rd National Light-
ing Exposition, Chicago.
April 11-15: 6th Western Metal Con-
gress and Exposition, Shrine Audii-
torium, Los Angeles.

April 19-21: South West District
Meeting, American Institute of Elec-
trical Engineers, Baker Hotel, Dallas,
Texas.
April 20-23: Spring Meeting, Ameri-
can Society of Civil Engineers, Okla-
ahoma City, Okla.
May 1-27: Inaugural Exhibitions in
the new building, and 26th Annual May
Show of works by local artists, The
Akron Art Institute, Akron, Ohio.

Model of office building for busy corner
in Tulsa. Carson & Lundin, Architects

OFFICE BUILDING

Now under construction in Tulsa,
Okla., is a 20-story office building which
will house the First National Bank &
Trust Company of Tulsa and the main
offices of the Sun Ray Oil Corp. To cost
approximately $5,500,000, the building
was designed by Carson & Lundin, New
York architects. It will have exterior
walls of gray brick, with lighter colored
marble. Windows will be continuous,
arranged in 5-ft. units to facilitate
installation of office partitions with a
wide degree of latitude. An unusual
feature will be an open arcade on the
ground floor. The First National’s main
banking floor will be located on the
second floor of the building, and will be
reached from the street level by moving
stairs. Other bank services will be
housed in the first sub-basement and
on the third, fourth and fifth floors.

COMPETITION WINNERS NAMED
Low-Cost Furniture

Nearly 3000 entries from 31 countries
were submitted in the Competition for
Low-Cost Furniture sponsored by the
Museum of Modern Art, New York
City, and the Museum Design Project,
Inc., results of which were announced in
mid-January.

The $5000 first prize for seating units
was divided between Don R. Knorr of
Chicago and Professor Georg Lewald
of Berlin, Germany. Mr. Knorr, an
architect, is a graduate of the University
of Chicago and is currently working in
both architecture and furniture in the
office of Eero Saarinen at Bloomfield
Hills, Mich. Prof. Lewald is a designer

(Continued on page 164)
In a Kaylo roof deck you get:

**INSULATION**

**STRENGTH**

**LIGHT WEIGHT**

in one material

Advantages never before combined in one roof deck material are yours with Kaylo Insulating Roof Tile.

**Kaylo Roof Tile:**

**Is lightweight.** This reduces dead load on buildings and saves steel. Weighing only about 5 to 6 pounds per square foot, Kaylo Roof Tiles are easy to handle.

**Is strong.** Kaylo Roof Tile is a reinforced structural unit designed for a total load of 50 pounds per square foot with an adequate safety factor.

**Insulates.** Special operation of applying insulation over the roof deck is eliminated. Kaylo Roof Tile has insulation value equal to an inch and a half of standard insulating board.

Kaylo Insulating Roof Tile can be specified for any standard structural roof. For special contour problems, Kaylo Roof Tile can be cut to fit, on the job.

**Easy to handle.** Two men here carry 8 Kaylo Roof Tiles, walking on roof deck already laid.

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Gentlemen: Please send free 12-page illustrated booklet.

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- There are two reasons why Kewaunee Laboratory Furniture rates top honors in so many of America's finest schools. First, because Kewaunee units are custom-engineered to fit science laboratory requirements. Second, they are mass-produced to fit school budgets!

Specially designed to stand up under hard school use, Kewaunee Furniture provides maximum working efficiency and time-saving convenience. And the new Kewaunee Laboratory Furniture is more rugged than ever! Door and drawer suspensions are extra strong. Metal parts are Bonderized for maximum resistance to chipping, rusting and corrosion. KemROCK working surfaces are not affected by the action of acids, alkalies and solvents . . . will not fracture under ordinary physical shock.

Put Kewaunee Laboratory Furniture to work in your labs! You, too, will give it credit for easing your teaching load. Meantime, write for your free copy of Kewaunee's catalog of Laboratory Furniture. Address:

EDUCATIONAL DIVISION

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hitherto unknown in this country.

The $2500 second prize for seating units was divided between Charles Eames and the University of California, Los Angeles Campus, group with which he was working, and Davis J. Pratt of Chicago. The third prize of $1250 for seating units went to Alexey Brodovitch, art director of Harper's Bazaar since 1934.

Only the $5000 first prize for storage units was awarded, the recipients being Robin Day and Clive Latimer, well-known British designers. The $2500 prize for the best research report was awarded to James L. Prestini and the Armour Research Foundation of the Illinois Institute of Technology, where Mr. Prestini is now working.

The Simmons Prize, offered for a sleeping unit convertible for daytime use, was not awarded as no designs submitted were considered superior to those already in use.

Honorable Mentions, carrying no reward, were given for a seating unit design to John O. Merrill and John B. McMorran of Massachusetts Institute of Technology, and for a storage unit design to Ernest Race, an English designer.

(Continued on page 166)
WARE
Aluminum
WINDOWS
LIGHT YET STURDY
CHEERFUL SILVERY
APPEARANCE
NO PAINTING-NO RUST
EASILY OPERATED
FROM THE INSIDE
STORM-TIGHT

HEAVIER VENT SECTIONS • FLASH WELDED CORNERS
EXTENSION OR BUTT HINGES • STAINLESS STEEL PINS & WASHERS
CHOICE OF BUTTERFLY OR CAM LOCKING HANDLES

Manufactured by WARE LABORATORIES, INC. in Miami, Florida
GENERAL OFFICES AND SALES OFFICES: 1827 Delaware Parkway, Miami 35, Fla. • NEW YORK OFFICE: 21 West Street

CHOICE OF BUTTERFLY OR CAM LOCKING HANDLES
The optional choice of butterfly type for use with venetian blinds or the standard cam locking handles gives you a freedom of choice.

CHOICE OF BUTT OR EXTENSION TYPE HINGES
The sturdy Ware butt hinge with stainless steel bushings, pin and washers or the convenient Ware extension hinge with stainless steel pins and washers are optional.
Tile Flooring

Winners in the $10,000 Kentile-Architectural Forum design competition have been announced as follows:

First prize of $1500 to A. Albert Cooling of Los Angeles, for his design of a living room;

Second prizes of $750 each to George Cooper Rudolph of New York (kitchen), Robert Pattison of Elyria, Ohio (living and dining room), and Mrs. Barbara Upshaw Siegel of Chicago (candy shop);

Third prizes of $500 each to Harlan E. McClure of Minneapolis (kitchen), Mary Royer of Los Angeles (living and dining room), and Thomas Weatherwax of Philadelphia (candy shop).

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A roof is no better than its shingle . . . and unless it's a good shingle, the effort and skill you put into your building is wasted.

Bird Masterbilt Thick Butt Shingles stand the test of time . . . a Bird roof is a better roof. Extra layers of asphalt and deeply embedded mineral granules give tough lasting protection where it counts . . . on exposed tabs. The rugged surface defies weather . . . and fire resistance is greatly increased for the long life of the shingle. Narrower cut-outs and heavier shadow-lines give added massive beauty . . . and a wide range of handsome lasting colors and blends is available.

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Home Cooling
In 2 Easy Steps
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Package Attic Fan

Provide this 38” x 40” ceiling opening

Install the Hunter Package Fan in the Attic (Fan, shutter and switch in one compact unit)

A Complete Unit: No expensive, space-consuming suction-box is required for installation . . . just a simple ceiling opening for the Package Fan, plus attic exhaust vent. Shutter and switch are built-in. No ceiling grille or other accessories needed.

Performance Guaranteed: Certified air delivery rating: 9500 CFM, with shutter operating. Fan guaranteed for five years, motor for 1 year. Basic design features have been proved in thousands of homes. Highest quality construction assures quiet, trouble-free operation. See our Section in Sweet’s. Or write for Architect’s Data File.

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RESULT: cool comfort throughout entire house

Hunter Package Attic Fan

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nounced the 18th annual consideration of candidates for the Kate Neal Kinley Memorial Fellowship. The Fellowship provides a sum of $1200 to be used for foreign travel and study, with a minimum of five months' residence in the foreign country chosen. It is open only to graduates of the Rice Institute Department of Architecture. For further information address The Department of Architecture, The Rice Institute, Houston 1, Texas.

The University of Illinois has announced the 18th annual consideration of candidates for the Fine Arts Memorial Fellowship. The Fellowship provides a sum of $1000 toward defraying the expenses of advanced study of Fine Arts in America or abroad. It is open to graduates of the University of Fine and Applied Arts of the University of Illinois and to graduates of similar institutions of equal educational standing whose principal studies have been in Music, Art, or Architecture. Applicants should not exceed 24 years of age on June 1, 1949. Requests for application blanks and instructions should be addressed to Dean Rexford Newcomb, College of Fine and Applied Arts, Room 110, Architecture Building, University of Illinois, Urbana, Ill. Applications should reach the Committee by May 1st.

Florida School Reorganized

The University of Florida has announced that its School of Architecture and Allied Arts has been redesignated as the College of Architecture and Allied Arts. The College is composed of the Department of Architecture, the Department of Art, and the Bureau of Architectural and Community Research. William T. Arnett, a member of the faculty since 1929 and director of the School since 1946, has been named dean of the College and director of the Bureau of Architectural and Community Research. John L. R. Grand, a member of the faculty since 1937, has been named head of the Department of Architecture.

Appointments

Henry S. Churchill, town planner and architect of the firm of Churchill-Fulmer Associates, has been named an Associate in Planning at Columbia University. Mr. Churchill, who has been a special lecturer and advisor on town planning at the University, will act as a critic during the spring session.

Robert B. O'Connor, of the New York architectural firm of O'Connor and Kilham, has been appointed supervising architect of Princeton University.

At helstan F. Spilhaus has been named Dean of the Institute of Technology of the University of Minnesota.

Carnegie Tech's Building Program

Carnegie Institute of Technology has announced the reopening of a $4 million campus building and renovation program, which will include a million-dollar building for Engineering Hall, a power plant and a steam and electricity distribution system expected to cost over $1 million, and extensive revamping and renovation of available space in existing buildings of the colleges of Engineering and Science, Fine Arts and Margaret Morrison Carnegie College. The program originally was decided upon in March, 1947, but was not put into effect because of the high building costs. The plans have been revised somewhat to permit available funds to cover as much as possible of the original program.
The new basic mouldings in the Premier line of Pittco Store Front Metal may be truly called a Moulding Kit. They may be combined in a wide variety of attractive patterns, giving the architect fresh style and beauty, and great variety in design to help in the creation of distinctive, sales-winning store fronts.

Shown here with the same head and drip members are three of the many designs which may be formed with these new shapes. Cross sections of some of the new mouldings are shown at left.

Most of the shapes in the Premier Moulding Kit are interchangeable and may be used both horizontally and vertically. They make it easy to design several adjacent store fronts, giving each a distinctively different appearance through the proper selection and arrangement of mouldings.

This convenient Moulding Kit of Pittco Premier Store Front Metal, is another result of “Pittsburgh’s” constant research, aimed at helping you solve architectural and building problems encountered in the field.
New Engineering Building

Construction of a million-dollar engineering building has been begun at Wayne University in Detroit, as the first step in the developing of engineering facilities for 1382 students now enrolled in its Engineering College. Engineering students heretofore have been using facilities developed under emergency conditions in old and temporary structures.

The first unit to be built under the program will be three stories high, and will contain the essential power and supply equipment for the additional structures to be built later. The building will be of reinforced concrete construction, the exterior faced with brick. Interior partitions will be cinder block, and the flooring will be colored Master-plate finish over concrete. Architects are Pilafian and Montana of Detroit.

OFFICE NOTES

Offices Opened, Reopened

The H. K. Ferguson Co., Industrial Engineers and Builders, has established a new Western district office in Los Angeles. The office, at 712 Curson St., will be managed by Henry Maag, a member of the Ferguson organization for the past 22 years.

Myron F. Nelle, Structural Engineer, has opened his own office at 707 Cottage Grove Ave., South Bend 16, Ind. His past experience has been with residential, commercial, industrial and public utilities structures.

John T. Simpson, A.I.A., Architect and Engineer, has opened an office at 12 Broad St., Red Bank, N. J. Formerly of Newark, Mr. Simpson has been doing special work for the War Department for the past six years.

Max J. Wolfson, Architect, has opened his own office at 3845 Alta Vista Terrace, Chicago 13, Ill.

New Addresses

The following new addresses have been announced:


Paul Kang, Consulting Engineer, 260 Kearny St., San Francisco, Calif.

George E. McIntyre, Architect and Engineer, 528 Dwight Bldg., Kansas City, Mo.

Thomas L. Shepherd, Architect, 7466 Girard Ave., La Jolla, Calif.

New Firms, Firm Changes

Othmar H. Ammann and Charles S. Whitney have announced the reorganization of the firm of Ammann & Whitney, Consulting Engineers, with the following staff members as Associate Partners: Milton Brumber, Werner Ammann, Boyd G. Anderson, and James S. Whitney. Offices are maintained at 76 Ninth Ave., New York 11, and at 724 E. Mason, Milwaukee 2, Wis.

A new firm, Architectural & Engineering Enterprises, Inc., of 1806 Hillcrest Dr., Bartlesville, Okla., has been organized to serve the architect whose volume of work has been limited by lack of drafting help. The new firm will take the architect's preliminary drawings and produce from them complete working drawings and specifications, bound and ready for the contractor. All mechanical and structural engineering is furnished.

Ford, Bacon & Davis, Inc., Engineers, of New York, Philadelphia, Chicago and
Some Houses Leak Like a Sieve . . .

INSULATING ROCKLATH*

Is the Vapor Barrier That Controls Condensation

Some houses leak like a sieve—from the inside out. For example, consider a house of normal construction but without a vapor barrier. During periods of low winter temperature, up to $2 \frac{1}{2}$ gallons of water vapor a day may condense in each 1,000 square feet of unprotected exterior wall.

Insulating ROCKLATH prevents up to 95% of this moisture condensation. In winter, a sheet of aluminum foil laminated to ROCKLATH plaster base at the mill prevents the entrance into the walls of dangerous quantities of water vapor. In summer, this aluminum foil reflects the sun’s radiant heat . . . helps keep the house cool and comfortable.

Insulating ROCKLATH, the ideal plaster base, performs three services for little more than the cost of one—and at no extra application cost! Its bright aluminum foil is a very efficient heat reflector and vapor barrier for use in residential construction.

In most states FHA requires certain minimum insulating and vapor barrier values. Insulating ROCKLATH and plaster in residential wall construction will usually provide the FHA values, as well as an ideal plaster base.


United States Gypsum

For Building • For Industry

Gypsum • Lime • Steel • Insulation • Roofing • Paint

MARCH 1949
Los Angeles, have announced the election of E. S. Caldwell as president, succeeding James F. Towers, who will actively continue as chairman of the Board of Directors.

The Kuljian Corp., Engineers and Constructors, of Philadelphia, has announced the appointment of Edwin Lundgren as their Washington, D. C. representative, with offices at 1415 K St., N.W.

Abraham Levy and Edwin H. Silverman have announced the establishment of individual offices for the practice of architecture in their present quarters at 1411 Walnut St., Philadelphia 2, Pa. The firm of Silverman & Levy was dissolved on December 31.

E. B. Van Keuren, Chas. F. Davis, Jr., Paul M. Speake and J. Marion Thrasher have announced the formation of a partnership for the general practice of architecture and related engineering under the firm name of Van Keuren, Davis and Company, Architects & Engineers. Address: American Life Bldg., Birmingham, Ala.

The name of the firm of Merrill & Wigen, Architects, has been changed to Frederick E. Wigen, Architect. Address: 132 S. Washington Ave., Saginaw, Mich.

ELECTIONS, APPOINTMENTS

Edmund N. Bacon has been appointed executive director of the Philadelphia City Planning Commission. A graduate of Cornell University College of Architecture, Mr. Bacon has worked with architects Oskar Stonorov and W. Pope Barney of Philadelphia, and in 1938 was awarded a graduate fellowship to study under Eliel Saarinen at Cranbrook Academy.

John M. Dacey, formerly economic adviser and director of planning for the Chicago Housing Authority, has been appointed executive director of the National Association of Housing Officials.

Richard J. Seltzer, Philadelphia realtor, has been reelected president of the Urban Land Institute. Reelected to serve with him were: Foster Winter, Detroit, vice president; Herbert U. Nelson, Chicago, secretary; and L. D. McKendry, Chicago, treasurer.

Franklin Thomas, Professor of Civil Engineering and Dean of Students at California Institute of Technology, has been elected president of the American Society of Civil Engineers.
TRUCKS THAT HAVE ADEQUATE PLATFORMS ... ROOM TO MOVE AROUND IN ... SAVE YOUR DOLLARS AND TIME!

Today, with mounting costs all along the line, loading platform congestion is a serious problem. No matter how much money you pour into new tools and methods—inadequate shipping facilities will always eat into your profits.

Right now, make a study of your "bottleneck" areas. Minor remodeling can often take care of normal plant expansion for years to come.

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THE AMERICAN TRUCKING INDUSTRY

AMERICAN TRUCKING ASSOCIATIONS, WASHINGTON 6, D. C.
quately against the fungi of bluestain and decay only where a little extra assistance suffices to discourage the organisms. As a rule these are places where the wood is dry most of the time but occasionally becomes damp enough for the fungi to grow. A well established example is the window sash in houses, which normally stay too dry for attack but in cold weather when moisture condenses on the glass, may give trouble unless they are treated. On the other hand, superficially applied preservative does not furnish adequate treatment for wood that remains damp much or all of the time, such as wood in contact with the soil.

**Water-Repellent Preservatives**

Water-repellent preservatives, which contain the ingredients needed for both water repellency and preservation in the same mineral spirits solution, make it possible to impart moderate resistance to moisture changes and to fungi in a single treatment of wood. They are products of dual purpose. The water repellency is not impaired by incorporation of the preservative and the resistance to bluestain and decay is not sacrificed, in fact it may be enhanced, by the combination with water repellents.

**Wood Sealers**

Wood sealers are forms of varnish or lacquer made to sink into wood surfaces but not to penetrate much beyond the pores close to the surface. They are themselves decorative finishes of a kind that cannot chip or wear off as surface coatings do. They may also serve to seal or prime the wood in preparation for surface coatings of wax, varnish, lacquer, or enamel. A single application of wood sealer gives wood much less protection against change in moisture content than can be obtained with a water repellent, but two applications of wood sealer may prove equal to or, with the best sealers, somewhat superior to a water repellent in protection.

Preservative wood sealers contain fungicides. The water-repellent preservatives, because they penetrate farther into wood, are considered superior to preservative wood sealers for keeping wood free from bluestain and decay. Sealers, however, are now used fairly frequently for woodwork exposed to the weather when a natural finish is desired. In such uses the preservative is often needed to resist mildew, which is a growth of fungi on the surface of the finish. A good plan is to apply a water-repellent preservative first, to preserve the wood, and then to apply the preservative wood sealer to give the desired appearance.

The water-repellent preservatives and related products enjoy a wide field of usefulness in which they can improve the service or prolong the life of wood that has usually had to struggle along without treatment of any kind. Such wood and other kinds of wood that absorb moisture quickly and rot easily can be particularly benefited. Structures in which there are joints through which rainwater gains access to unprotected parts of the wood can be improved at their most vulnerable points. On the other hand the limitations of these products by reason of the superficial way in which they are applied should be kept constantly in mind; they should not be used where more thoroughgoing treatments are needed.
WOOD... Stimulant to Sales

Where discriminating people shop, the atmosphere of quality that beautiful woodwork imparts is a potent stimulant to sales. That is why wood, beautifully formed and finished, is a basic element of any interior designed for selling. It is well to remember that two generations of outstanding architects and store designers have looked to the craftsmen of Woodwork Corporation for faithful reproduction of their ideas. Creative men have always appreciated the Woodwork policy of adhering precisely to details. Discriminating people have approved the results, not only in retail establishments, but in a long list of hotels, clubs, dining rooms, office suites and churches noted for their beautiful wood interiors. Whether your plans involve a complete interior, or a single display case Woodwork craftsmen and executives are prepared to meet your needs. Your inquiry will receive immediate attention and a prompt reply.

WOODWORK CORPORATION OF AMERICA
1426 WEST TWENTY-FIRST STREET • CHICAGO & ILLINOIS

MARCH 1949
is decreased when more "cover" is added. Naturally the uniformity could be made almost perfect if the pipe were placed with negligible clearance between the coils, but the cost would be prohibitive. Optimum comfort, when considering uniformity, can be taken as the best that can be afforded. Generally the maximum pipe spacings are taken as 12 in. for a concrete slab and 9 in. for plaster construction.

PANEL CONSTRUCTION

The three points of panel construction are (1) controllability, (2) uniformity and (3) availability. Controllability means that a panel must be able to respond to changing heating requirements with sufficient speed to permit the control devices to maintain the desired air and panel temperatures. The effect of conductivity of the material over pipe coils and depth of the coils has already been discussed. But it might be well to point out that there is no space for variation of pipe coil depth for wall or ceiling panels as normally fastened to metal lath and covered with plaster. For floor slabs there is the possibility of a compromise between a deep coil with good uniformity and poor control with a shallow coil having poor uniformity and good control. The latter is favored, however (see Fig. 4) because good control is more important than uniformity.

Availability of panel area means that the portion of heated surface that has been considered effective by the designer should not be made ineffective by changing furniture, rugs, tapestries, or other objects that will reduce or in other words "hide" the radiating surface. For example, if a designer requires 1000 sq. ft. of wall panel area in an office and it is necessary to place filing cabinets against all but 500 sq. ft. of the wall area, then the availability of panel is insufficient.

REVERSE SIDE HEAT LOSSES

Floor Panels

During the fall when the heating system is just starting to operate, the ground beneath the slab is at its minimum temperature — about 60 F. Then losses from the back of panel to the ground are at a maximum; however, total heat load on the system is very low because of the higher outside air temperatures. The boiler, therefore, has sufficient reserve to carry the back losses during the peak periods. During coldest weather, when the boiler is operating at full capacity, the ground has been warmed and back losses are at a minimum. It is for this condition that back losses should be computed in determining the size of the boiler. Floor panel construction to minimize back losses is illustrated in Fig. 4. (See also Time-Saver Standards, Architectural Record, Jan., 1948.)

Wall and Ceiling Panels

When wall or ceiling panels are used adjacent to warm rooms there is, of course, no back loss. When the reverse side of the panel is exposed to unheated spaces (outdoors, attic, etc.), insulation to prevent back losses must be determined from an economic standpoint. Back losses add slightly to the boiler size and fuel bill, but insulation adds to the initial cost. The proper amount of insulation, therefore, depends upon initial costs, fuel costs, and interest rates.

(Continued from page 135)
For Low Cost Homes...

Why not use part of the attic for the "Furnace Room" with a gas-fired Janitrol THERM-O-ATTIC FORCED AIR FURNACE.

Put the heating in the attic? Yes, it's entirely practical with a Janitrol Therm-O-Attic—the installation works like a charm—we have testimonials to prove it. Now, think of the advantages for low-cost homes, where you want to merchandise all that's modern, but you've got to trim costs without seriously sacrificing quality.

1. No basement is needed for the heating plant.
2. You don't use up scarce closet space.
3. Short simple duct systems cut down installation costs.
4. Grills at floor levels lead into return air ducts.
5. Heat is comparable to a more expensive installation of a winter air conditioner.
6. A merchandising plus—the Janitrol Unit can be operated in summer for attic ventilation to exhaust hot air from rooms.
7. Janitrol Therm-O-Attic furnaces are complete, factory-assembled and tested packages to further simplify installation.

So, here's the way to put more sales appeal into your smaller homes—provide all the advantages of clean, automatic and economical gas heat with the famous Janitrol name, and at the same time cut your costs. Write today for complete specifications and operating data.

Compact Janitrol Therm-O-Attic Forced Warm Air Furnaces are available in 4 sizes to meet practically every Btu requirement and are equipped for operation with natural, manufactured or LP-Gases.

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO
Janitrol Winter Air Conditioners, Gravity Furnaces, Conversion Burners, Unit Heaters, Boilers and Triple Service Systems

MARCH 1949 177
PREVENTING DAMAGE TO PANELS

Where floor or wall panels are contemplated, adequate protection should be provided to prevent damage to pipe coils or warm air ducts.

Floor Panels: a substantial cover of concrete will prevent damage that might be incurred due to excessive concentrated loads such as narrow wheel trucks or sharp objects. Such damage could also occur during the moving of heavy furniture or in garages and warehouses. Another hazard to floor coils exists if there is any probability of renovation such as cutting in new drains for a garage floor. Although not an injury to floor panels, the placing of large crates, stock piles or low furniture will "hide" the panel and prevent effective radiation.

Wall Panels: where heavy vehicles are likely to be used near wall panels, the panels should be protected with a bumper placed on the floor similar to those used to protect a fence. It is seldom wise to use an inside wall for panels in commercial buildings since they are often altered. In residences, wall panels of thin tubing are apt to be punctured when tapestries or pictures are hung. If the panels are not injured, they are at least made less effective as radiant areas.

VENTING

The venting problem for radiant heating coils is just the same as for any other forced hot water system; however, some points should still be stressed. When the system is being filled, petcocks at the end of the coils must be opened to release the air. After the system has been completely filled, any air that gets into the system must either leak in or be released by the air at the boiler. If a positive pressure of 2 or 3 psi is maintained in the coils, no air will leak into the system, so the only remaining source is the boiler. There are vents made for the purpose of venting the boiler; these vents should be located preferably at the boiler or at the high point by the expansion tank. The use of automatic air vents at high points is unnecessary; they frequently rust and become useless. The air that remains after filling the system will be carried along by the high velocity of the water and eventually expelled at the vent or collected in the expansion tank.

APPEARANCE OF RADIANT PANELS

The appearance of a radiant heating panel should remain unimpaired until it has been decided to redecorate the panel. This means that streaking and cracking must be considered in selecting the material and in constructing the panel.

It is generally accepted that present construction practices allowing 3/4 in. cover of plaster will prevent cracking and streaking of the panel. In addition to having an acceptable appearance, the material should have a high conductivity. If low conductivity materials are used, the required boiler water temperature will be increased and the controllability will be decreased.

The material should also withstand the operating temperature that is to be used. For example, some asphalt products tend to soften at temperatures of 100 F; therefore, these materials would be inadequate for coverings in halls where panel temperatures of 100 F are expected.
WHEN THE FINEST COSTS THE LEAST . . . . . . . YOU WANT IT!

Drop-forged Von Duprins are the highest quality exit devices made. They have longer life and far greater strength. They add the precision, beauty and character of drop-forged metals to the doors on which you put them.

Yet, in the end, all this extra quality, this added dependability and fine workmanship cost nothing. The higher first cost is soon absorbed by the freedom from maintenance expense and the perfection of their trouble-free, attention-free, care-free operation. Drop-forged Von Duprins provide exit . . . safe and sure beyond comparison . . . at the lowest cost per year.

Isn’t that just what you want?

VON DUPRIN DIVISION
VONNEGUT HARDWARE CO., INDIANAPOLIS 9, IND.
WOOD PRESERVATIVE

Insurance against premature replacement of millwork is among the benefits claimed by the manufacturer for Tremco Wood Preservative, a double-action treatment which is said to keep moisture out — reducing warping, shrinking, swelling — as well as preventing wood from rotting.

Usable for treatment of wood either during fabrication or at the time of installation, Tremco Wood Preservative is applied by impregnation, dipping, brushing or painting.

Strips of wood treated with Tremco and buried in the ground for test purposes were reported by the manufacturer to have remained in excellent condition. The Tremco Manufacturing Company, 8701 Kinsman Rd., Cleveland, Ohio.

The architect has not only himself to please, but also the building owner and the public. He therefore chooses wisely when he specifies Vermont Marble. Proof of this is shown in this statement made by the owner of the above building in Stamford:

"We have never properly expressed our appreciation of the marvelously accurate work and the beautiful appearance of the front you furnished for our new building. Without doubt it is the finest business building front in Stamford. We have received a great many compliments." (Signed)

Charles G. Talbott, Executive Secretary.

Whether for building exteriors or interiors, or for Memorials, the correct variety of marble is now available, produced by the most modern plant equipment. Choose Vermont Marble for:

COLOR • CHARACTER • PERMANENCE • LOW MAINTENANCE

crystalline VERMONT MARBLE

VERMONT MARBLE COMPANY • PROCTOR, VERMONT

Branch Offices:
Boston • Chicago • Cleveland • Dallas • Houston • Philadelphia • Los Angeles • New York • San Francisco

In Canada: Ontario Marble Company, Ltd., Peterboro, Ontario and Toronto, Ontario
Brooks Marble & Tile Company, Ltd., Toronto, Ontario

AIR DIFFUSERS MODIFIED

A modification in the design of the Knob-Draft adjustable air diffusers, a new, quick-opening set-lock assembly, is reported to reduce installation time and simplify cleaning and inspection by allowing the whole inner element of the unit to be removed or replaced in a few seconds.

The diffuser is comprised of an outer, stationary cone and an inner, remov-
These Experiences are Proof

"Increased dollar volume and better employee efficiency have resulted from my decision to install Frigidaire Air Conditioning in my jewelry store," says Robert S. Cohen, Winchester, Ky. "We achieved increased efficiency and cost savings." (See chart for details.)

"Frigidaire's high quality was well known to us," says B. F. Spilzig, executive vice-president of Sterling-Holman Printing Co., Chicago. "That's why we picked two Frigidaire Room Conditioners for relief from heat and grime." North Town Refrigeration Co., Chicago, sold the equipment.

"One of our best investments — both from the stand points of employee efficiency and operating costs — is our Frigidaire Air Conditioning System," says Harold Star, executive vice-president of the Dallas Title & Guarantee Co., Dallas, Texas. The dealer was Joe Hoppie & Co., Dallas.

Frigidaire's high quality is known to the executive vice-president of Sterling-Holman Printing Co., Chicago, B. F. Spilzig, who decided to install Frigidaire Air Conditioning in his store. The Frigidaire installation was handled by North Town Refrigeration Co., Chicago.

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Frigidaire makes a good business better! Frigidaire's high quality is known to the executive vice-president of the Dallas Title & Guarantee Co., Dallas, Texas, Harold Star, who decided to install Frigidaire Air Conditioning in his store. The Frigidaire installation was handled by Joe Hoppie & Co., Dallas.

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For fast facts about Frigidaire Products — fill in and mail coupon today

Frigidaire Air Conditioning
- Room size air conditioners. Store size air conditioners. Central systems.

Frigidaire Water Coolers
- Pressure, bottle and industrial types; central systems. Variety of sizes and capacities.

Frigidaire Reach-In Refrigerators
- Self-contained or remote types up to 60 cu. ft. Forced air or ice-making cooling units.

Frigidaire Ice Cream Cabinets
- Remote and self-contained models, 1-hole to 10-hole sizes.

Frigidaire Display Cases
- Self-service and standard types. Normal and low temperature models.

Frigidaire Beverage Coolers
- Both wet and dry models available in several sizes.

Frigidaire Compressors
- Sealed rotary and reciprocating types. Sizes up to 25 H.P.

Frigidaire Cooling Units
- Forced air, wet and dry expansion evaporative and ice-making types.

Frigidaire Home Appliances
- Household Refrigerators
- Home Freezers
- Electric Ranges
- Kitchen Cabinets and Sinks
- Automatic Washer, Ironer, Dryer
- Electric Water Heaters
- Electric Dehumidifiers

Name..................................................
Address.............................................
City..................................................
County............................................
State..............................................

MARCH 1949
METAL ENTRANCE DOORS

Fenestra stock, hollow-metal entrance doors are now available for use in offices, apartments, stores, schools, etc.

Furnished in one standardized size, 3 by 7 ft., the doors may be used in single or double openings and are supplied with a standard cylinder lock. Bronze push and pull bars and bronze ball bearing hinges are supplied if desired. The doors may be hinged right or left to swing in or out.

These doors come complete with frames and hardware machined, fitted and ready to assemble. Detroit Steel Products Co., 3113 Griffin St., Detroit 11, Mich.

"QUILTED" PLASTIC MATERIAL

Quilting without stitching is the feature of a new plastic material developed for use in upholstery and wall covering.

Sealulf, which the manufacturer reports is resistant to scuffing, abrasion, alcohol, grease and dirt, is made by using electronic heat to seal Vynilite plastic sheeting, a layer of fire-resistant filler material, and a backing of Vynilite plastic film.

Available in a wide range of colors, the material may be had with front surface either plain or embossed in patterns resembling leather, sharkskin, moire or taffeta. Jason Corp., Hoboken, N. J.

(Continued from page 180)

Save $1
OUT OF EVERY $5
by using
the Durisol Insulated Roof Plank

This roof plank combines so many functions in one material...all at one low installation cost...that $4 does the work of $5 as compared with other materials. Note the 3-in-1 advantages of this light-weight, precast, factory-coated plank:

1 Fireproof, reinforced, cement-surfaced, and ready for application of the built-up roofing.

2 Because Durisol itself is such an effective barrier against heat losses, no additional insulation is required.

3 Noise-deadening ceiling at no extra cost...distinctive and pleasing in appearance, with a sound absorption coefficient of 0.87 at 512 cycles.

Durisol is made from chemically mineralized wood fibres bonded with Portland cement and moulded under pressure. It is unaffected by moisture and is proof against rot, mould, vermin, termites—proved incom bustible by laboratory tests.

DURISOL is made from chemically mineralized wood fibres bonded with Portland cement and moulded under pressure. It is unaffected by moisture and is proof against rot, mould, vermin, termites—proved incom bustible by laboratory tests.

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Width</th>
<th>Maximum Span</th>
<th>Weight per sq. ft.</th>
<th>Long Edge</th>
<th>Load</th>
</tr>
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<tbody>
<tr>
<td>3 1/4&quot;</td>
<td>16&quot;</td>
<td>6'8&quot;</td>
<td>15 lbs.</td>
<td>Tongue and Groove</td>
<td>40 lbs. per sq. ft. live load with high safety factor.</td>
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<tr>
<td>4 1/4&quot;</td>
<td>16&quot;</td>
<td>8&quot;</td>
<td>18 lbs.</td>
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For complete information, write for folder (A.I.A. File Number 4-K). Also see catalog 3c/13a, Sweet's File Architectural, 1949.

DURISOL, INC. 420 Lexington Avenue, N. Y. 17, N. Y.

(Continued on page 184)
The emphasis on Sellevision in advanced store front design is increasingly evident. Sellevision permits the shopper to see deeply into the store interior and to preview its alluring attractions. With the reduced height of Safety-Set metal sections, greater Sellevision is actually provided.

The largest plates of glass are held securely in the deeper grip which characterizes all Brasco sash. Heavy-duty bars, substantially reinforced, supply extra protection for enlarged and heightened areas. The complete line is expertly fabricated and handsomely finished in both stainless steel and anodized aluminum of heavy gauge.

Many additional features contribute to Safety-Set's superiority. For nearly four decades we have worked in close collaboration with the country's leading architects and store designers. Safety-Set Construction embodies their ideas as well as our own. That's why Safety-Set offers the utmost in practical construction and distinguished appearance, for wisely spent store front dollars.

** A COMPLETE LINE FOR EVERY DESIGN **

Brasco MANUFACTURING CO.
Harvey • (Chicago Suburb) • Illinois
Specialists in Metal Store Front Construction for more than 35 Years.
strength than cast iron while being far less brittle. The pipe and fittings are furnished in 2, 3 and 4 in. sizes. General Aluminum Supply Corp., Rialto Bldg., Kansas City 6, Mo.

TRIGGER-ACTION TACKER

A trigger-action stapler especially designed to work in places where there is not room enough to swing a hammer is now available.

Bostitch Model T-5, for driving staples into wood and similar materials, has a short, narrow base that gets into small places and is said to drive the staple within \( \frac{3}{16} \) in. of inside corners, moldings, etc.

Three models are available, using light, medium, and heavy wire staples of varying lengths. The machine weighs only 3 lb. Bostitch, 651 Mechanic St., Westerly, R. I.

(Continued from page 182)

HEAVY DUTY TUBULAR LOCKS

Yale Heavy Duty Tubular Locks, made to be assembled in 30 seconds, have been developed in an effort to cut building costs by reducing installation time.

Only two small holes bored in the door are necessary for installation; the entire mechanism of the new locks has been put into two cylindrical housings. The knob and cylinder axis fit into a hole bored through the door and the bolt goes into another hole bored into the edge of the door.

Five basic locksets, four of them with the optional deadlocking bolt, to make a total of nine different models, comprise the new line. The Yale & Towne Mfg. Co., Chrysler Bldg., New York 17, N. Y.

GAS FLOOR FURNACE

An automatic gas floor furnace which requires no basement or utility room is reported by the manufacturer to provide the advantages of "big home" automatic heating at a fraction of the cost.

The unit, which is 25 \( \frac{1}{2} \) in. deep, is installed directly beneath the floor. Only the floor-level grill through which the heat flows is visible from the room.

Desired temperature is maintained by a wall thermostat, which automatically turns the gas supply on and off. Tennessee Enamel Mfg. Co., Nashville, Tenn.

ACOUSTICAL TILE

Development of a new acoustical tile composed of compressed glass fibers has (Continued on page 186)
Here's Why It Pays To Specify

**Pittsburgh Steeltex Lath For Plaster**

You get low maintenance and high fire protection in your buildings with Pittsburgh Steeltex Lath for Plaster. This combination of galvanized welded wire mesh and absorbent backing makes possible positive embedment of the wire mesh and provides maximum reinforcement and protection against plaster cracks. Also this reinforcement has earned high fire ratings for Steeltex including Underwriters' Laboratories, Inc. test R-2258.

In addition Steeltex provides a rigid troweling surface which speeds its application and saves plaster. For better plaster construction see our catalog in Sweet's or write for Catalog D.S. 130 to Dept. AR, Pittsburgh Steel Products Company, Grant Building, Pittsburgh 30, Pennsylvania.

**PITTSBURGH STEEL PRODUCTS COMPANY**

_A Subsidiary of Pittsburgh Steel Company_

_Pittsburgh, Pa._
been announced by the manufacturer.

The lightweight, perforated tile is described as non-combustible, and the manufacturer reports that its high sound-absorbing properties are supplemented by excellent thermal insulation value.

Weighing 0.7 lb. per sq. ft., the tile comes in two sizes, 12 by 12 in. and 12 by 24 in., both 3/4 in. thick.

The tile is said to be unaffected by humidity conditions and claimed not to warp, buckle, expand or contract. Owens-Corning Fiberglass Corp., Toledo 1, Ohio.

HOUSE NUMBERS

Metal numbers permanently cemented to a 12 by 12 in. glass block create a new house number said by the maker to be clearly visible by day or night.

A weatherproof lacquer is used to coat the numbers after they are cemented in place. The block, which is 4 in. thick, is installed in the frame or masonry of a new house during construction.

The Silhouette house number utilizes the light from inside to illuminate the figures and is reported to give a soft general illumination to the entrance porch as well. Paul M. Burroway, P.O. Box 3592, Phoenix, Ariz.

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HOUSE NUMBERS (Continued from page 184)

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NEW EVAPORATIVE CONDENSER
SAVES MANY COSTS

Where water for use in refrigerating condensers is expensive, high in temperature or difficult to secure and dispose of, the Worthington ECZ Evaporative Condenser saves water, equipment, space and money.

Water consumption is reduced 90% or more—only enough new water is added to make up for evaporation and keep the circulated water sweet and clean. No long line losses; and pumping costs are reduced proportionately.

Equipment such as cooling towers, water service and disposal facilities is not needed, saving investment cost, maintenance cost and space.

Prime surface coils are staggered to permit air deflection and wetting of the entire surface. Smooth surface makes washing easy and helps prevent scale accumulation.

Installation of this compact unit can be made inside or outside, in basement or on roof. Two types—Freon and Ammonia. Other features: Worthington Monobloc Pump, anti-corrosion fans (at slight extra cost), receivers available for Freon unit.

Write us for new Bulletin C-1100-B28, giving complete information. Worthington Pump and Machinery Corporation, Harrison, N. J. Specialists in air conditioning and refrigeration for more than 50 years.

Higbee Is Ahead On Air Conditioning, Too

One of the country's greatest department stores, considered throughout the retail business as a pace-setter, is Higbee's in Cleveland. 17 years ago, a Worthington 1,000-ton carbon dioxide refrigeration plant was installed to provide air conditioning. When it recently became necessary to enlarge the installation, the success of the original equipment suggested having Worthington provide the new machinery.

The new installation provides for 2,000 tons of Worthington centrifugal refrigeration.

J. Gordon Turnbull, Inc., Consulting Engineers.

Another Modern Plant Selects Modern Air Conditioning

When North American Manufacturing Company—manufacturer of oil and gas-fired furnaces—built its new plant in Cuyahoga Heights, Cleveland, it decided first, to install air conditioning. When it recently became necessary to enlarge the installation, the success of the original equipment suggested having Worthington provide the new machinery.

The new installation provides for 2,000 tons of Worthington centrifugal refrigeration.

Vincent Eaton, Consulting Engineer.

Why "Balanced Air"? Why Worthington?

The ideal air conditioning or refrigeration system consists of machinery all manufactured—not just assembled—by one company. This makes more possible a perfect balance among all interrelated machinery.

Worthington is the company that manufactures all the vital "innards"—compressors, condensers, engines, turbines, pumps. The result is a completely integrated system—for more efficient, more economical operation.

That's why there's more worth in Worthington. See your nearby Worthington distributor—in the Classified Telephone Book.

MARCH 1949
and inspection, are finished in white. The end caps, which do not have to be removed or disturbed for servicing, are aluminum finished. Sylvania Electric Products, Inc., 500 Fifth Ave., New York, N. Y.

UNDERGROUND DAM

Shellperm, a new method of controlling subsurface seepage which may cause loss or pollution of water, consists of a subterranean barrier built without excavating by injecting an asphalt emulsion into the earth through a pipe.

In addition to its function in water conservation, the originator claims it can also be used to check seepage around tunnels, road beds or other subsurface structures, without the use of such relatively expensive techniques as sheet piling.

Pumped under low pressure through a metal pipe driven into the ground, the asphalt emulsion spreads out and then coalesces, producing a mass impermeable to water. After repeated injections at progressively higher levels have produced a vertical asphalt column, the pipe is moved and the process repeated until overlapping columns form an underground dam.

Special importance is attached to the development because at depths of more than a few feet, control of underground movement of water has heretofore been costly and difficult. Shell Oil Company, Inc., 50 West 50th St., New York 20, N. Y.

NEW SHADE IN STRUCTURAL GLASS

Vitrolite structural glass now comes in a tenth shade, Sky Blue, the first new color to be added to the line in 1949.

Sky blue is described as a more subdued shade, deeper and richer, than the provar Princess Blue, which it replaces. It is being produced in 1/16 in. thickness with a fire-polished surface.

Vitrolite is considered especially suitable for bathroom and kitchen in the home and for rest rooms in public buildings because its color is permanent, being inherent in the glass itself. Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo 3, Ohio.

CONVECTOR RADIATORS

Designed for household, institutional and commercial installations, a new line of Type F Convector-Radiators is said to combine attractive appearance with high heating efficiency.

Cabinets designed for either free standing or semi-recessed installations are made of formed steel with removable front panel. Stamped louvers integral with the front panel give directional circulation of air into the room.
SKYLETTE R

"Converts to hinged louvred or hinged glass bottom."

"Hinged wiring channel."

"All parts packaged for continuous mounting at no extra cost."

SKYLETTE RECESSED FIXTURE

EXCLUSIVE MATING SLOTS AND TRACK ASSURES PERFECT ALIGNMENT

NEO-RAY EXCLUSIVE PREFABRICATED PERFECT ALIGNMENT

Exclusive NEO-RAY ML-2448 is made in stock sections 24" and 48". They can be cut on the job to fit all types of job conditions such as: projections from wall, curved areas and center columns and yet maintain rigid and perfect alignment, no cork screw effect.

SOLD THROUGH ELECTRICAL WHOLESALE JOBBERS

WATCH FOR NEO-RAY'S NEW SLIMLINE FIXTURES!

MARCH 1949
Copper tubes and aluminum fins of the heating elements are intended to ensure prompt response to heat control devices, and die-formed collars on fin holes give large heat transfer contact between tube and fin instead of the line contact afforded by mere punching of fin holes.

Heating elements are available without convector cabinet for use in buildings where specially designed concealed radiation is specified. They come in standard 4, 6, or 8 in. widths and lengths up to 64 in. Fedders-Quigan Corp., Buffalo 7, N. Y.

EXPLOSION-PROOF HEATER

The new Electromode All-Electric Explosion-Proof Heater is expressly designed for use where inflammable gases, mixtures, or other highly flammable substances are manufactured, used, handled or stored, all locations specified by Underwriters' Laboratories in Class 1, Group D.

Fire, shock and burn hazards are said to be eliminated by the Safety-Grid, the patented, cast aluminum, natural convection feature of the heating element. The element consists of a nickel-chromium resistor wire, insulated and sheathed in seamless metal tubing, and imbedded in a one-piece finned aluminum casting.

The Electromode Explosion-Proof Heater has been approved by the Underwriters' Laboratories, Inc. Electromode Corp., 45 Crouch St., Rochester 3, N. Y.

Unique Interior Effects

Cabot's Stain Wax makes possible a variety of striking effects for interior woodwork. With a single application, Cabot's Stain Wax produces the color of a penetrating stain and the lustre of a soft wax finish. Available in many unique light shades including white and gray. The transparent wax surface is long lasting and easy-to-clean.

Write today for FREE SAMPLE and COLOR CARD.
See for yourself what Cabot's new Stain Wax can do.

SAMUEL CABOT, INC.
322 Oliver Building, Boston 9, Massachusetts
WELDWOOD PANELING ... one basic reason for the architectural excellence of THE ZILBOORG HOUSE

This interesting Dri-Built home was designed on a 4' module...to make most efficient use of Standard Weldwood Panels

ARCHITECT Percival Goodman's modern technique and use of modern materials make a showplace of the recently completed home of Dr. & Mrs. Gregory Zilboorg, Bedford Village, New York.

Almost every room is paneled in Weldwood, using either birch, maple, cedar or oak. And...taking advantage of the ease with which "built-ins" can be planned into Weldwood walls...Mr. Goodman provided extensive cabinet and storage wall accommodations in the bedrooms, kitchen, dining room and living room...all executed in matching Weldwood.

Other features include ceilings of acoustical tile...brick-paved flooring in the entrance foyer, with most of the other floors in cork tile...and a dead-flat built-up roof which is flooded with two inches of water throughout the summer for cooling purposes.

Another interesting detail is the use, in most rooms, of Keyhole Standards and Brackets extending from floor to ceiling between each Weldwood panel. This makes possible easily moveable, random width shelving almost anywhere in the house. In addition, the metal strips contribute an interesting decorative effect to the Weldwood-paneled walls.

Add other advantages of dri-wall construction, such as tight, rigid sheathing and sub-floors...fast, economical construction...and you can see why this particular design gives a client a house he will be proud of.

But don't limit your thinking of Weldwood just to the "modern" designs. Dri-wall construction and, especially, Weldwood-paneled interiors fit any architectural style.

So plan now to add extra appeal and convenience to your designs with Weldwood. There are many fine hardwoods, both domestic and imported, to fit right in with any motif. Write for complete information.

WELDWOOD Plywood
Weldwood Plywood and Mengel Flush Doors are products of
UNITED STATES PLYWOOD CORPORATION THE MENGEL COMPANY
New York 18, N. Y.
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Weldwood® Hardwood Plywood
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California Pine Weldwood
Mengel Flush Doors
Weldwood Fire Doors
Weldwood Flush Doors
Douglas Fir Doors
Overhead Garage Doors

Tekwood® (paper-faced plywood)
Prestwood
Weldwood Glue® and other adhesives
Weldtec® (stirred plywood)
Decorative Micarta®
Firwood®
Flextex®
Fairex® and Satindex®

Weldwood Plywood is made in both Interior and Exterior types, the former bonded with extended area resins and other approved bonding agents; the latter with phenol formaldehyde synthetic resin.
tins, remains resilient and is water- and weatherproof to insure leak-proof windows without maintenance costs of painting. Tremco Mfg. Co., 8701 Kingsman Rd., Cleveland, Ohio.

FOLDING LUNCHROOM TABLES

All-steel, folding table and bench units designed to convert gymnasiums, auditoriums and similar areas into lunch rooms are now being offered with marblized as well as solid color linoleum tops.

These folding tables are available in two types — against-the-wall and in-the-wall units. The first type folds into a cabinet that extends 7 in. from the wall, and can be installed in existing buildings without remodeling. The second type is built into the wall in new construction. Schieber Mfg. Co., 12720 Burt Rd., Detroit, Mich.

STAINLESS STEEL SHOWER CABINET

The Bathe-Rite Stainless Steel Shower Cabinet is available especially for application where maintenance is a big factor such as hotels, hospitals, institutions and industrial plants.

Every item in the construction of the new shower cabinet is said to be corrosion resistant — from the porcelain enameled reinforced receptor to walls, fastenings, shower head, valves and curtain rings.

This shower cabinet, 36 in. in size, is said to be particularly easy to install. Milwaukee Stamping Co., Bathe-Rite Div., 865 S. 72nd St., Milwaukee 14, Wis.

CELLULAR CEILING

A new type of louvered ceiling for diffused lighting has been developed which consists of thin, corrugated, steel strips prefabricated into honey-combed panels. The panels fit together into a single continuous ceiling when hung below lighting fixtures.

The panels come in 24- or 30-in. widths and in lengths varying by 6 in. steps from 96 down to 12 in. The light weight of Cell-Cell, 12 ounces per sq. ft., is said to eliminate cumbersome, expensive hanging equipment.

The Cell-Cell panels are galvanized, bonderized and finished in pastel shades of baked enamel. Federal Enterprises, Inc., 8700 S. State St., Chicago 19, Ill.

MODULAR FURNACE

With the Mueller Climatrol Modular Furnace, the home owner can buy a complete winter and summer air conditioning system in installments.

The basic unit is a gravity furnace with oil or gas automatic firing. A forced circulation blower and a summer cooling unit can be added later.

Standardization and interchangeability of the units allows the system to be expanded without making the original equipment obsolete. L. J. Mueller Furnace Co., 2065 W. Oklahoma Ave., Milwaukee 7, Wis.

AUTOMATIC HOT WATER AIR VALVE

Complete elimination of air from convectors, radiators, mains, baseboard radiators and panel heating units is claimed for the new Dole No. 20 Automatic Hot Water Air Valve.

It is announced as "the first fully automatic hot water air valve." A coin or screw driver sets the selector screw.

(Continued from page 190)
**Exclusive Advantages of Low Velocity Air Diffusion!**

*Pyle-National Multi-Vent's unique principle of low velocity, pressure displacement air diffusion through perforated metal is fully protected by U.S. and foreign patents. Only with Multi-Vent can you enjoy its benefits.

1. **No Strong Air Streams to Direct!** Only with Multi-Vent are duct velocities so radically reduced (within the diffuser itself) . . . diffusion so rapid, thorough and widespread . . . that no air movement in excess of ASHVE comfort zone requirements exists more than six inches away from the perforated distribution plate.

2. **No Deflection Problems to Restrict Location or Capacity of Outlet Panel!** Only with Multi-Vent can the location and the capacity of the diffuser be determined solely by load considerations assuring maximum effectiveness and efficiency. The proximity of seating locations or the relative positions of partitions and lighting fixtures—which must be a major consideration in locating high velocity diffusers to avoid drafts—need not be considered with Multi-Vent regardless of ceiling heights.

3. **No Change in Air Diffusion Patterns When Desired Volume of Air Delivered is Varied!** Only Multi-Vent has an adjustable pressure displacement valve which can be easily set for delivery of various amounts of air without disturbing the balance of the overall system. Neither single panel adjustments to suit occupants special requirements nor substantial reduction or increase of air capacity at source to meet seasonal demands will in any way affect the desired air flow pattern.

4. **40% Higher DTD Will Meet Comfort Zone Requirements!** Only Multi-Vent will permit raising the usual 15° Diffusion Temperature Differential to as high as 25° (with an eight foot ceiling for example). Thus 40% less air need be used to handle a given load making possible substantial economies in ducts, fans, filters and coils.

5. **No Protruding Outlet Fixtures to Mar the Beauty of Modern Interiors!** Only Multi-Vent can be completely concealed above the square perforated pans in a metal acoustical ceiling. Multi-Vent installed flush in all other type ceilings is less conspicuous than diffusers of any other make.

6. **Incomparable Uniformity of Room Temperature and Humidity!** Multi-Vent can achieve a temperature differential of as little as 1 degree within the comfort zone in all seasons . . . and 2 degrees is guaranteed! This insures true air conditioning comfort and will meet the most exacting air conditioning requirements for scientific research and industrial processing.

Write for complete specifications and selection data to THE PYLE-NATIONAL COMPANY, Multi-Vent Division, 1375 W. 37th St., Chicago 9, Illinois. Sales engineers and agents in the principal cities of the United States and Canada.
TO STOP LEAKS BEFORE THEY START—Specify

Minwax Mark Weathercap for masonry joints!

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Please send me free sample of Weathercap with descriptive folder and specification data.

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Address ____________________________
City ____________________________
State ____________________________

ARCHITECTURAL ENGINEERING
(Continued from page 192)

for one of the three functions: fully automatic air eliminator, manual shut-off, manual venting. The Dole Valve Co., 1933 Carroll Ave., Chicago 12, III.

LAWN HOSE HOLDERS

An answer to the problem of hose storage is offered in the Guardian Lawn Hose Holder, said to be simple to manipulate and a contribution to fire protection.

A wire basket attached to the basement ceiling receives the hose, which will coil itself into the receptacle after it

Wire basket attached to basement ceiling
stores garden hose until ready for use

is pushed with a very slight twist through a pipe leading from the exterior wall, according to the manufacturer's description.

The hose is always connected for immediate use with the water supply. Guardian Mfg. Co., P. O. Box 302, Minneapolis, Minn.

INTERCOMMUNICATION SYSTEM

An intercommunication system has been designed recently to enable workers to answer paged messages clearly and intelligibly from high noise level areas.

The new circuit coordinates the operation of a "trumpet-type" reproducer and a two-way "staff station."

When the system is used to page a person in one of the high noise level areas, the message is reproduced at high volume through the trumpet station. To reply, the paged person depresses a lever on the nearest staff station. The trumpet is automatically cut out, and two-way

(Continued on page 196)
It's Easy to Plan a Sound System...

—with time-saving RCA Engineering Service

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This benefit is yours when you use the services of RCA Sound Engineers to assist you when working out the details of a modern sound system. You also save time and save money.

There is no ready-made "package" system that perfectly suits the noise level, type of buildings, needs of various types of plant and office layouts. Working with RCA's practical help for architects, you provide clients with a sound system that gives them the most for their money. An RCA Sound System utilizes the latest developments in sound system engineering practice for high-quality reproduction of voice and music.

No matter what size or type of job you have on your drawing boards, RCA will help you. Put your sound system problems up to RCA. No obligation, of course.

Contact your nearest RCA Sound System distributor, or write: RCA Sound Products, Department 3C, RCA, Camden, New Jersey.

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SAVES UP TO 85% OF WASHROOM COSTS!
You eliminate towels completely with the Sani-Dri. No unsanitary litter . . . no fire hazard . . . no paper clogged soil pipes — Sani-Dri provides completely automatic drying service 24 hours a day, year after year with little or no maintenance! Sani-Dri pays for itself out of savings!

GET THE LATEST FACTS!
New brochure 1082 shows both built-in wall and pedestal models of new faster-drying Sani-Dri electric hand and face dryer. Write today!

Distributors in Principal Cities

THE CHICAGO HARDWARE FOUNDRY CO.
"Dependable Since 1877"
8349 Commonwealth Avenue
NORTH CHICAGO, ILL.

(Continued from page 194)

conversation at normal voice level can be conducted between the person paged and the originator of the call.

Formerly, when replies were made through a two-way trumpet reproducer, the trumpet would pick up all shop noises so that the reply was frequently unintelligible.

The trumpet reproducer is constructed of heavy gauge, spun aluminum with gray wrinkle finish; it is 10 1/2 in. in diameter and in overall length, and is equipped with an adjustable mounting bracket. The compact, die-cast staff station is 6 in. wide, 6 1/2 in. high and 3 1/2 in. deep, and is finished to match the trumpet reproducer. Executeone, Inc., 415 Lexington Ave., New York 17, N. Y.

ELECTRIC RADIATOR

Electrically heated through the medium of hermetically sealed oil is a new pressed steel radiator unit called Hur-seal.

The thermostatically controlled radiator is filled with a special grade, low expansion oil, and is permanently sealed. An electrical element, welded into the radiator or wall panel types, heats the oil and is said to provide a quick temperature rise to a surface temperature of 160° F.

Twelve models of various heights and designs are available in a range of colors with glossy finish. Acrow, Inc., 155 Washington St., Newark, N. J.

PLASTIC WALL COVERING

A plastic coating for finishing concrete, brick or block walls is said to provide both color and texture in a single spraying operation.

The coating is described as resisting scuffing, grease and oil, water, sunlight and exposure to weather.

The product consists of a liquid binder of synthetic rubber and a powder composed of plastic materials and asbestos fibers. These components are mixed on the site with water, which serves as the vehicle for spraying.

Scolex-Top is made in white and in 12 different shades of green, red and yellow.

The coating is now available in the Chicago area and will be offered nationally, according to the manufacturer, when skilled applicator crews have been trained. Minnesota Mining and Mfg. Co., 900 Fanuier St., St. Paul, Minn.

You'll find that for replacement of obsolete equipment or for new installations, Todd Burners will effect savings in fuel and maintenance costs. Skilled Todd specialists, modern Todd facilities—backed by 35 years of engineering experience—guarantee you economical burning of liquid and gaseous fuels. See your local Todd dealer now!

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ORLEANS • LOS ANGELES • SAN FRANCISCO
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ARCHITECTURAL RECORD
Spokane's Fox Theater was built in 1931. For 18 years it has been exposed to frequent freezing and thawing cycles and extremes of temperature that range from -30°F to 108°F. Yet this severe weathering has had no effect on the architectural concrete. Arrises remain as sharp as when the forms were stripped.

Architectural concrete buildings like this that are designed and constructed to resist any weather conditions maintain their original good appearance and remain structurally sound indefinitely. Such durability is the result of applying the well-defined principles and procedures of quality concrete construction.

The beauty and durability of architectural concrete also make it ideal for apartments, hospitals, schools, factories, office and commercial buildings. Having long life and requiring little or no maintenance, architectural concrete renders low-annual-cost service, the true measure of construction economy. That's important to owners, investors and public officials.

Illustrations above show a general view of the Fox Theater, Spokane, with (inset) a close-up of large ornamental bas-relief butterfly panel cast integrally with the wall against a plaster mold built into the forms. R. C. Reamer and Frank Wynkoop were the architects. Alloway & George were the contractors.
Onan Emergency Electric Plants provide power for all essential needs:

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When storms, floods or breakdowns interrupt commercial power, Onan Standby Plants start automatically and take over the power load within seconds, stop when power is restored. Operating and maintenance costs are negligible. Widely used in hospitals and other institutions, radio stations, hatcheries, theaters, industrial plants... wherever power interruptions would be dangerous and costly. Available from 1000 to 35,000 watts.

Send coupon below for folder on Onan Standby Plants. It will help you specify the right size plant and the necessary accessories. If you have an unusual problem write our engineering department.

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ONAN STANDBY POWER

(Continued from page 140)

timber connectors are illustrated by sample designs and on-the-job photographs. Roof designs include trussed rafters, pitched trusses, Lank-Teco trusses, flat trusses and bowstring trusses. Special designs include bridges, trestles, towers, hangars, grandstands and farm structures. The book is being distributed free of charge to practicing architects and engineers. 116 pp., illus. Timber Engineering Co., 1319–18th St., N.W., Washington 6, D. C.

Boilers

Federal Boilers (Bulletin No. 125). Outlines special features and advantages of a line of boilers for radiant heating, domestic hot water, steam and hot water heating. Drawings and photos illustrate construction details. Ratings and specifications are listed. 6 pp., illus. Federal Boiler Co., Inc., Granite and West Sts., Midland Park, N. J.

LITERATURE REQUESTED

The following individuals and firms request manufacturers' literature:

- M. Raymond Adler and Co., Architectural Design, 120 Academy St., Poughkeepsie, N. Y.
- Pierre Buevrais, Architectural Student, 3518 Dorion, Montreal, Canada.
- Bilt-Rite Organization, Inc., General Contractors, 64 Fourth Avenue, Brooklyn 17, N. Y.
- A. Burns Cadwalader, Designer-Draftsman, 1525 Jay Street, Redding, Calif.
- Alvaro Cardenas, Carrera 13 No. 33–13, Bogota, Colombia, S. A.
- William V. Cobern, Architectural-Draftsman, 2913 Monroe Street, Ashland, Ky.
- Herbert I. Fogelberg, P. O. Box 300, Fort Lincoln, Bismarck, No. Dakota.
- Miss Luke Lietzke, Curator of Industrial Design, Akron Art Institute, 140 East Market Street, Akron 8, Ohio.
- John G. Marks, Jr., 5211 Gerry Drive, Pittsburgh 27, Pa.
- Frederick G. Nobbe, Architect, Box 98, R. D. 1, Long Branch, N. J.
- John T. Simpson, A.I.A., 12 Broad Street, Red Bank, N. J.
- Mrs. B. M. Smith, Librarian, Blair Public Library, Blair, Wis.

ARCHITECTURAL RECORD
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Many reasons account for the growing acceptance of oil heat for modern buildings. Hospitals, for example, emphasize the quiet operation and freedom from noisy fuel deliveries oil heat assures. Hotels welcome its dependable, comfortable warmth. To the exacting homeowner, it brings the convenience of automatic firing without furnace drudgery. To apartments it means a minimum of supervisory attention. To such establishments as hat factories it provides cleanliness, no soot or dirt.

AND when the plans call for a Petro, you gain a still further advantage — maximum heat per dollar of fuel cost.

You can appreciate why this holds true. Petro’s Thermal Viscosity Control enables a Petro oil burner to handle the heaviest, lowest cost fuel oil at high combustion efficiency. Since heavy oils have also highest heat content, substantial savings are assured.

Yet, Thermal Viscosity Control represents only one of several exclusive Petro fuel-saving features that result from Petro’s more than 45 years’ specialized oil heat experience. As Mr. Severud puts it, when you want “maximum heat from each dollar of fuel cost,” specify Petro.

One of the country’s outstanding consulting engineers, Mr. Fred N. Severud has been identified with the engineering profession for the past quarter century. He has served as consultant on such well-known structures as: Rome Air Depot, Rome, N. Y.; Lillian Wald Housing Project, New York; Tripler General Hospital, Hawaii; Veterans Hospital, Wilkes-Barre, Pa.; Hotels Interamericanos, Panama; Broadcasting Station KNX, Los Angeles, Calif.; and the Office Building and Broadcasting Station, Reykjavik, Iceland. Mr. Severud expresses this opinion of oil heat:

"Where we have used Petro Systems, we have found that a large part of their economy record is due to Petro's Thermal Viscosity system for burning lowest cost oils at high combustion efficiency and with completely automatic operation. This means maximum heat return from each dollar of fuel cost and a labor expense limited to nominal observation.

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FULL DATA on Petro Industrial Burners are in catalog files of Sweet’s, and Domestic Engineering. Details on Petro Domestic Burners available in separate catalog. Copy of either sent gladly on request.
INTRODUCTION TO ARCHITECTURAL DESIGN
Donald Atkinson Fletcher • Architect D.P.L.G.

A HANDBOOK FOR STUDENTS • DESIGNERS • ARCHITECTS • TEACHERS
Dealing with the design process and with problems encountered in designing buildings. Published December 1947 • 6" x 9" • 212 pages
For beginners in architecture, this book offers a systematic introduction to design. It states in organized form material in design that is treated orally in the drafting room, but usually at random. Only when this material has been grasped can the study of design become effective. Basic factors in design, selected and paired, are exemplified by common architectural subjects forming eleven short exercises. These are arranged in a typical sequence, in an order suitable for learning. (Reviewed in December 1948 issue of Architectural Record.)

IN USE AS A TEXT
Department of Architecture, Rice Institute
Department of Landscape Architecture, University of Illinois
Department of Landscape Architecture, University of Georgia

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Halsey Taylor DRINKING FOUNTAINS
During New England's severe winter of 1947-8, the J. C. Corrigan Company, Inc., of Dorchester, Mass., cut its fuel bill nearly 50% by installing a DRAVO Counterflo Heater. Coal for the previous winter season had cost this company between $1100.00 and $1200.00, whereas only $652.00 was spent for oil to fuel the DRAVO Heater during a similar period.

Besides fuel savings, the maintenance expense for the old heating system was practically eliminated because the DRAVO Heater operates automatically by thermostatic control. "Even more important" says J. C. Corrigan, President, "... part of our substantial increase in production this winter was due to the improved heating system."

Employees in the Corrigan plant manufacture custom-built conveying systems and need adequate warmth for efficient fitting and assembling. Previously, the plant was heated by a coal burning furnace using blowers and ductwork to distribute the warm air. Excessive roof heat losses in this 165' x 70' x 27' building, prevented it from being comfortable. To heat "cold spots" that developed, eight pot-bellied stoves were installed. Maintenance of this old heating method required three hours labor every day. Coal and ashes had to be hauled through the heart of the busy plant. Even with the eight stoves to supplement the coal-fired furnace, heat was inadequate and employees spent valuable production time huddling around the stoves.

In November 1947, one DRAVO Counterflo Heater with an output capacity of 2,000,000 Btu was installed. No ductwork was needed. Only fuel and power lines had to be connected and a vent stack installed. Now the entire factory area is maintained at the proper degree of warmth for workers' comfort and efficient production. During sub-zero weather last winter, the single DRAVO Heater delivered enough heat within 20 minutes after it was turned on to satisfy the thermostat's setting. Moreover, the DRAVO Heater is shut down to conserve fuel during non-working hours, whereas the coal furnace had to be fed over weekends while the plant was not in operation to maintain some warmth for the Monday morning shift.

DRAVO Counterflo Heaters burn oil, gas or coal. Units burning non-solid fuels can be converted from one fuel to another very readily. Coal-fired heaters can be converted for burning gas or oil.

You may also have a problem like Corrigan's—or one more complex. Write us for information and the name of our nearest representative. DRAVO CORPORATION, Heating Section, Dravo Bldg., Fifth and Liberty Avenues, Pittsburgh 22, Pa.
REST ASSURED—a Wayne Grandstand or Gymstand can be depended upon for safety. Their all-steel understructures are designed to carry full live load, plus impact and sway, with an ample factor of safety.

The Type “H”, for example, is a safe, inexpensive, steel portable grandstand that meets almost every outdoor need. Note, in the photo below, that the construction permits base members to adjust themselves to uneven ground without straining the supporting members. Note, also, the strongly fabricated supporting structure and the comfortable seats and footrests.

Furnished in depths up to 15 rows and in 15 foot units, or as a continuous stand, the Type “H” presents a good appearance and is really economical. You can find out more about this grandstand by writing to:

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GLASIRON PANELS!

Since 1924, the word for attractive, durable building panels has been: Glasiron.

These porcelain enameled-steel building fronts have always possessed excellent resistance to hard knocks, abrasion, temperature extremes and corrosive atmospheres.

And now they are free of the threat of unsightly rust stains.

These rust stains could have been caused by the steel clips used to attach panels to wood, masonry or other building materials. The careful erection of a building front frequently requires adjustment of the clips — bending, twisting and hammering. Their protective coating is often fractured or knocked off, leaving the metal itself exposed.

After a thorough testing of several other alloys, Inconel® was specified for the attachment clips. Corrosion resistant and completely rustproof, Inconel's high ductility permits quick, easy panel installation.

Inconel-equipped Glasiron building panels are made in a wide selection of sizes, shapes, colors and finishes ... for all sizes and types of buildings. Full information and specification details can be obtained by writing the manufacturer, Wolverine Porcelain Enameling Co., Detroit, Michigan.

The Wolverine Company’s use of Inconel is only one of the dramatic ways in which the Inco Nickel Alloys are providing “life-of-the-building” service. Better known examples are Monel® Tie Wire and Monel Roofing Sheet. These materials are regularly specified by leading architects throughout the country.

Corrosion-resistant, strong and highly ductile, Monel Tie Wire is used to secure metal or fabric lath to furring bars, channels and studs. It is also used to anchor brick and masonry to framework.

Monel Roofing Sheet can be easily and quickly fabricated into gutters, downspouts, flashings and louvers as well as complete metal roofs. Its superior mechanical properties and corrosion resistance make it possible to use light weight, economical sheet thicknesses. As a result, roofers’ quotations on Monel roofing parts are comparable to those submitted on other materials — and sometimes they are even lower.

You can easily get full information on Monel Tie Wire and Monel Roofing Sheet. Write today for our free, fully-illustrated literature.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET
NEW YORK 5, N.Y.

MARCH 1949
Specify CALDWELL ADJUSTABLE SASH BALANCES for the same price as ordinary balances

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ARCHITECTURAL RECORD
March 29th . . . when the history-making new lighting discovery by Holophane will be revealed . . . in Booths 11 & 12 at the Third International Lighting Exposition, Stevens Hotel, Chicago.

Those unable to attend the exposition are invited to write for full details of this important lighting development which will be released immediately on March 29th.
### Selection Chart for Wires and Cables

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>CABLE NO.</th>
<th>RECOMMENDED CABLE</th>
<th>MAX. VOLT.</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission and Distribution</td>
<td>14</td>
<td>Okonite Paper</td>
<td>75,000</td>
<td>Lead-covered, high voltage</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Okonite V. C.</td>
<td>28,000</td>
<td>Tighten and risers to 28 KV</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Okefoil</td>
<td>12,000</td>
<td>For severe abrasive or free conditions</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Okoloom</td>
<td>12,000</td>
<td>Insulated to prevent ground contacts —</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Candee</td>
<td>5,000</td>
<td>Insulated or insulated</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Okolite</td>
<td>35,000</td>
<td>With built-in messenger—light weight, economic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5,000</td>
<td>Either Unlay or Duelling construction</td>
</tr>
</tbody>
</table>

### AERIAL

<table>
<thead>
<tr>
<th>Application</th>
<th>CABLE NO.</th>
<th>RECOMMENDED CABLE</th>
<th>MAX. VOLT.</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution, Feeders and Power</td>
<td>2</td>
<td>Okolite</td>
<td>35,000</td>
<td>Non-metallic or wet locations Types RW and RWS</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Okonite</td>
<td>28,000</td>
<td>General use for “permanent” buildings</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Okonite V. C.</td>
<td>20,000</td>
<td>General use</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>Hazakrome</td>
<td>12,000</td>
<td>Types T and TW, general use and wet locations</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Okosheath</td>
<td>12,000</td>
<td>Non-metallic in wet locations</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Waterlite</td>
<td>5,000</td>
<td>Type RW, wet locations</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Okolite</td>
<td>5,000</td>
<td>Type RW and RWS, wet locations</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Performite</td>
<td>5,000</td>
<td>Types R, general use — for 75°C, operation</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>Hazakrome</td>
<td>5,000</td>
<td>General use</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>Hazakrome</td>
<td>5,000</td>
<td>Types T and TW, general use and wet locations</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>Hazard Armored</td>
<td>5,000</td>
<td>Small diameter</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>Hazardex</td>
<td>400</td>
<td>Laminated metallic armor</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Okolitex</td>
<td>600</td>
<td>Non-metallic sheathed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>600</td>
<td>Type RU, also for communication</td>
</tr>
</tbody>
</table>

### BUILDING

<table>
<thead>
<tr>
<th>Application</th>
<th>CABLE NO.</th>
<th>RECOMMENDED CABLE</th>
<th>MAX. VOLT.</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior Cables</td>
<td>8</td>
<td>Hazard Telephone</td>
<td>600</td>
<td>Dry braided</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Okolitex</td>
<td>600</td>
<td>Small diameter, light weight</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Hazard Telephone</td>
<td>600</td>
<td>Outside wire — weatherproof</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Okotel</td>
<td>600</td>
<td>Twisted pair or quaderead pairs</td>
</tr>
</tbody>
</table>

**Compiled to Help You...**

**...Condensed to Give You Vital Data on Cable**

Shown above is part of a specimen page in Okonite's basic condensed catalog. You may have it already in your office bound in Sweet's Architectural, Builders', Engineering, Mechanical Industries, Power Plant, or Process Industries Files. If you do not have any of these catalogs, or if you should wish an extra reprinted copy, you can get one from us merely by requesting it on your company letterhead.

It contains descriptions of each cable listed under “buildings” and twenty other classifications in the Selection Chart. Almost all these wires and cables are illustrated. Protective Coverings and Conductors are treated separately in illustrated sections of their own along with a section on Okonite Tapes and Splicing Materials. When you write, ask for Bulletin AR-1036-B. The Okonite Company, Passaic, N. J.