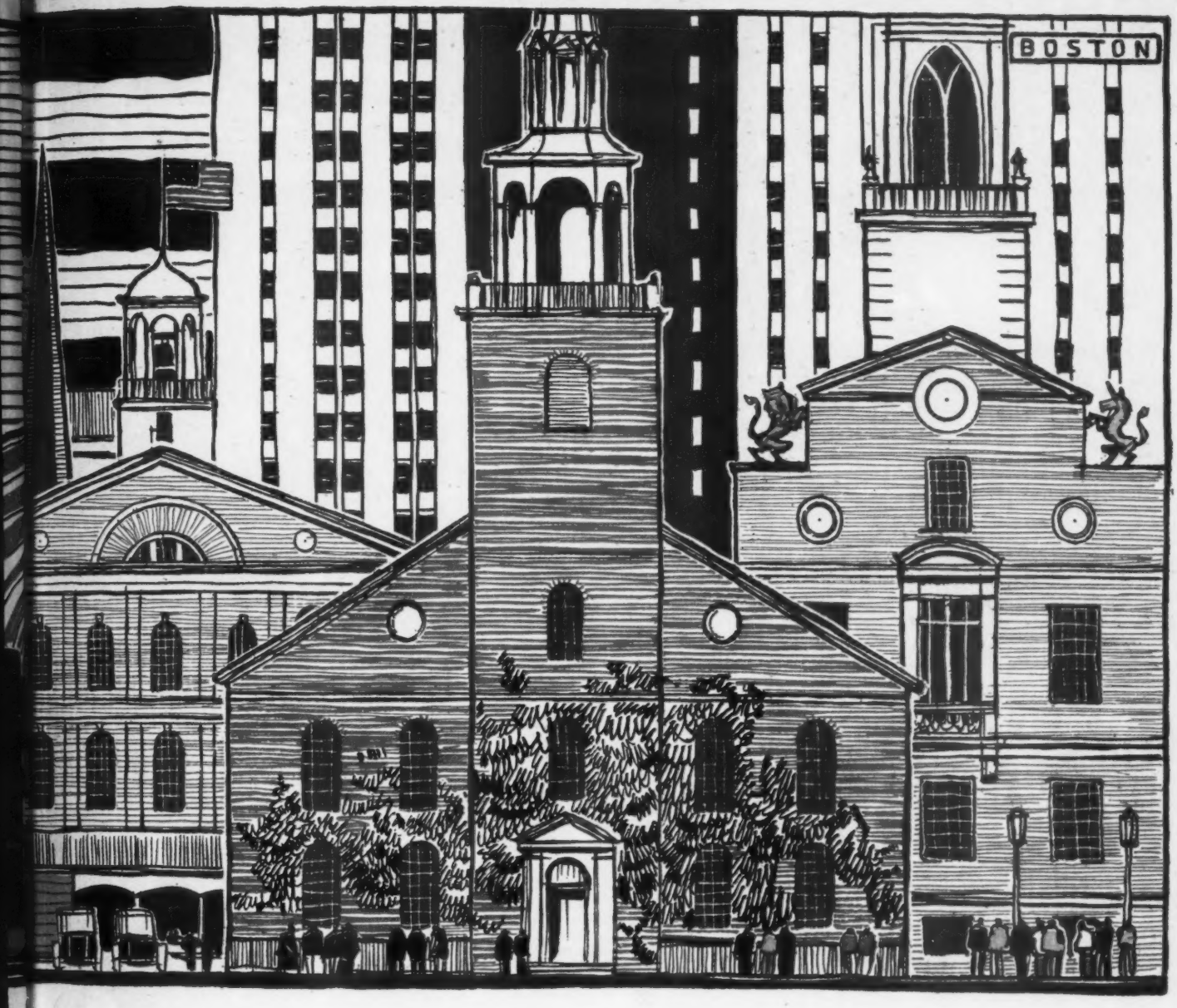


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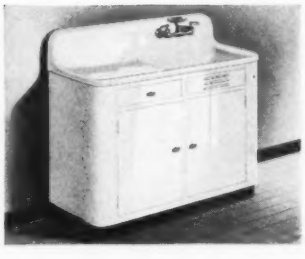

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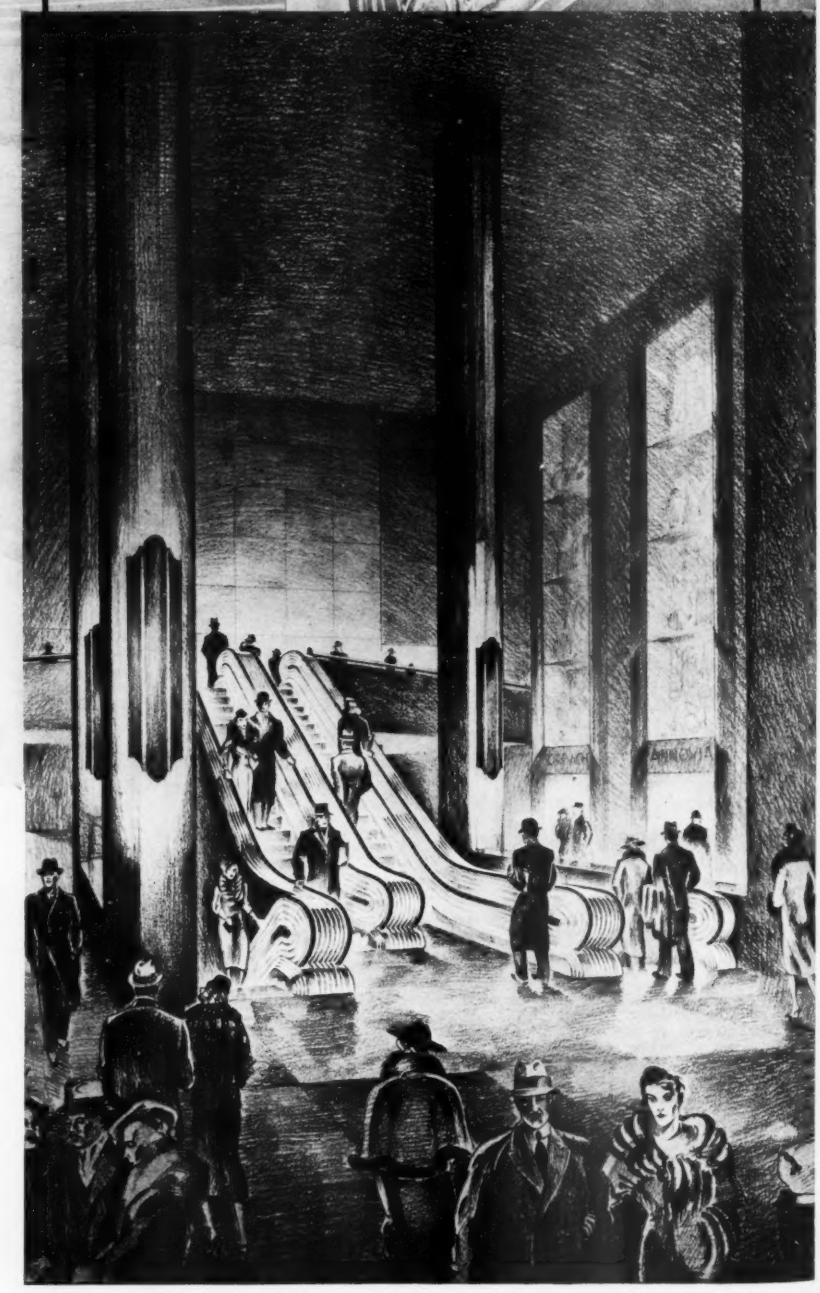

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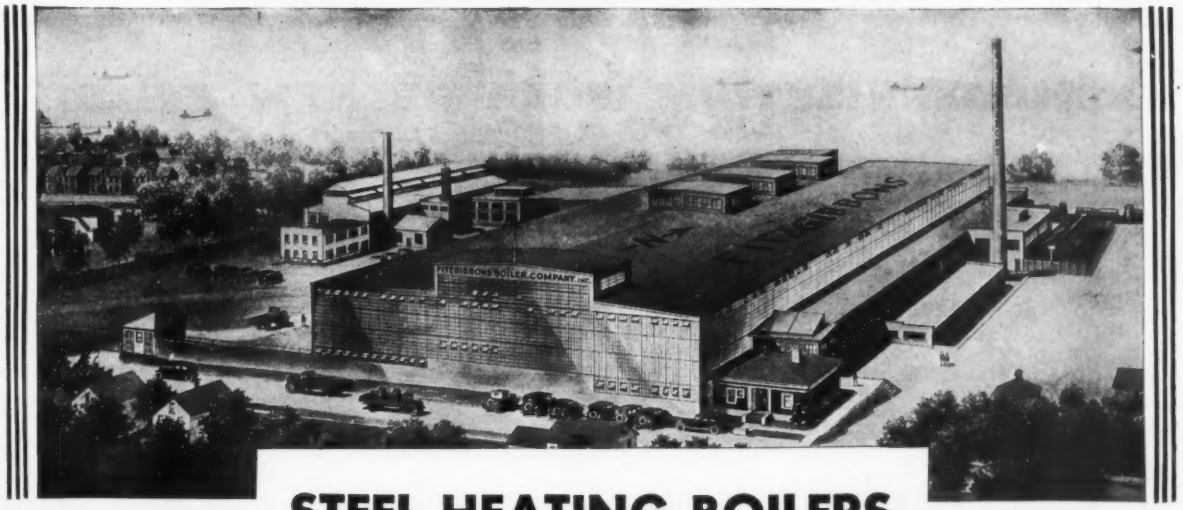


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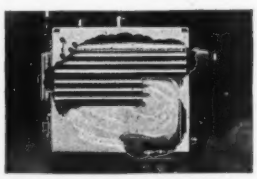

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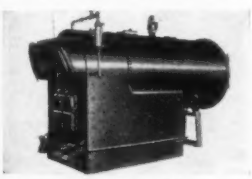

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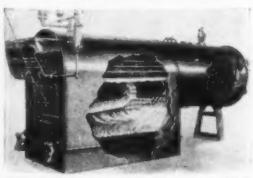

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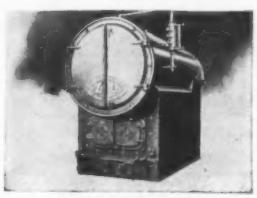

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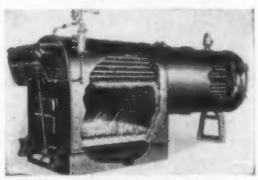

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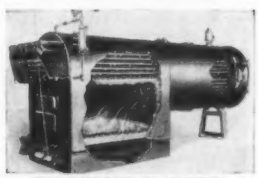

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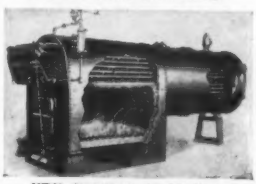

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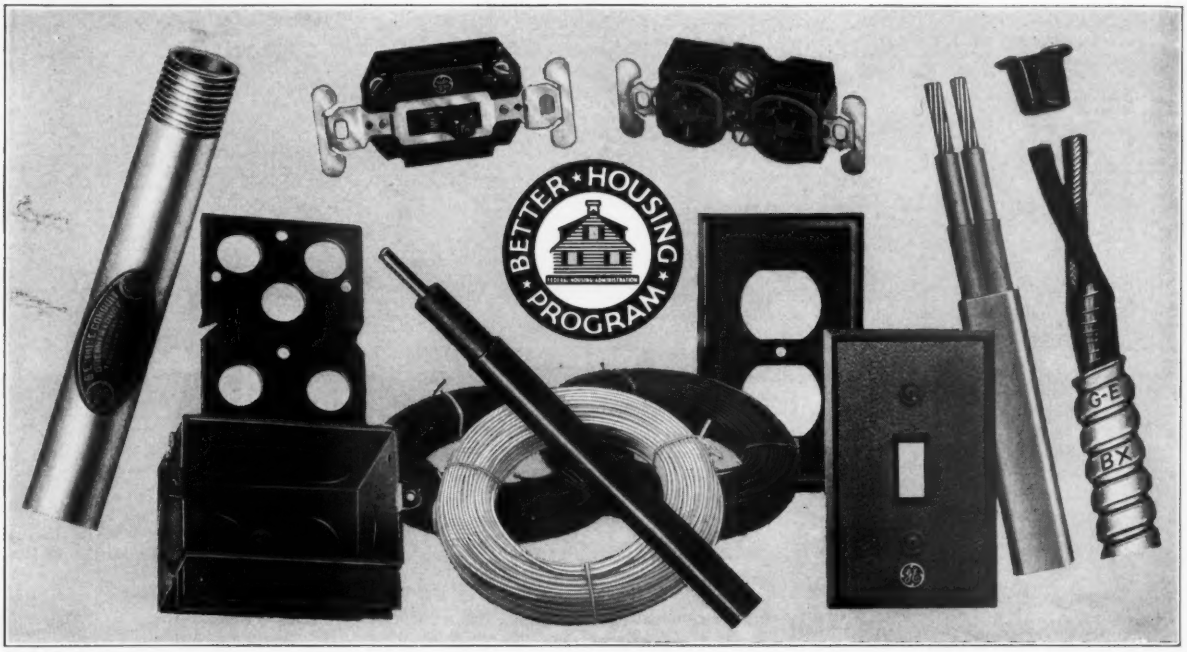


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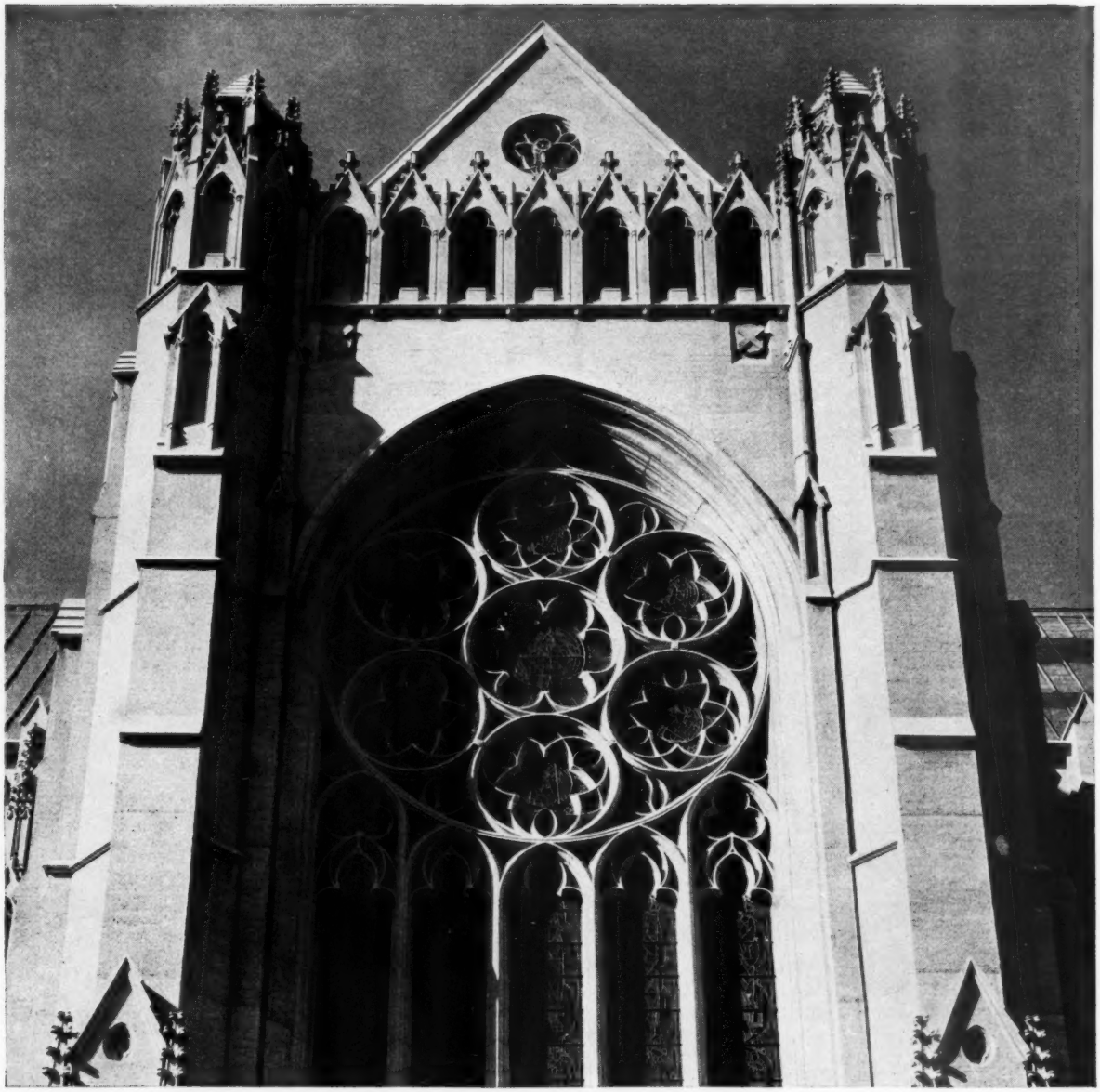

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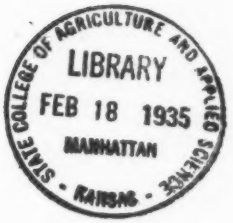



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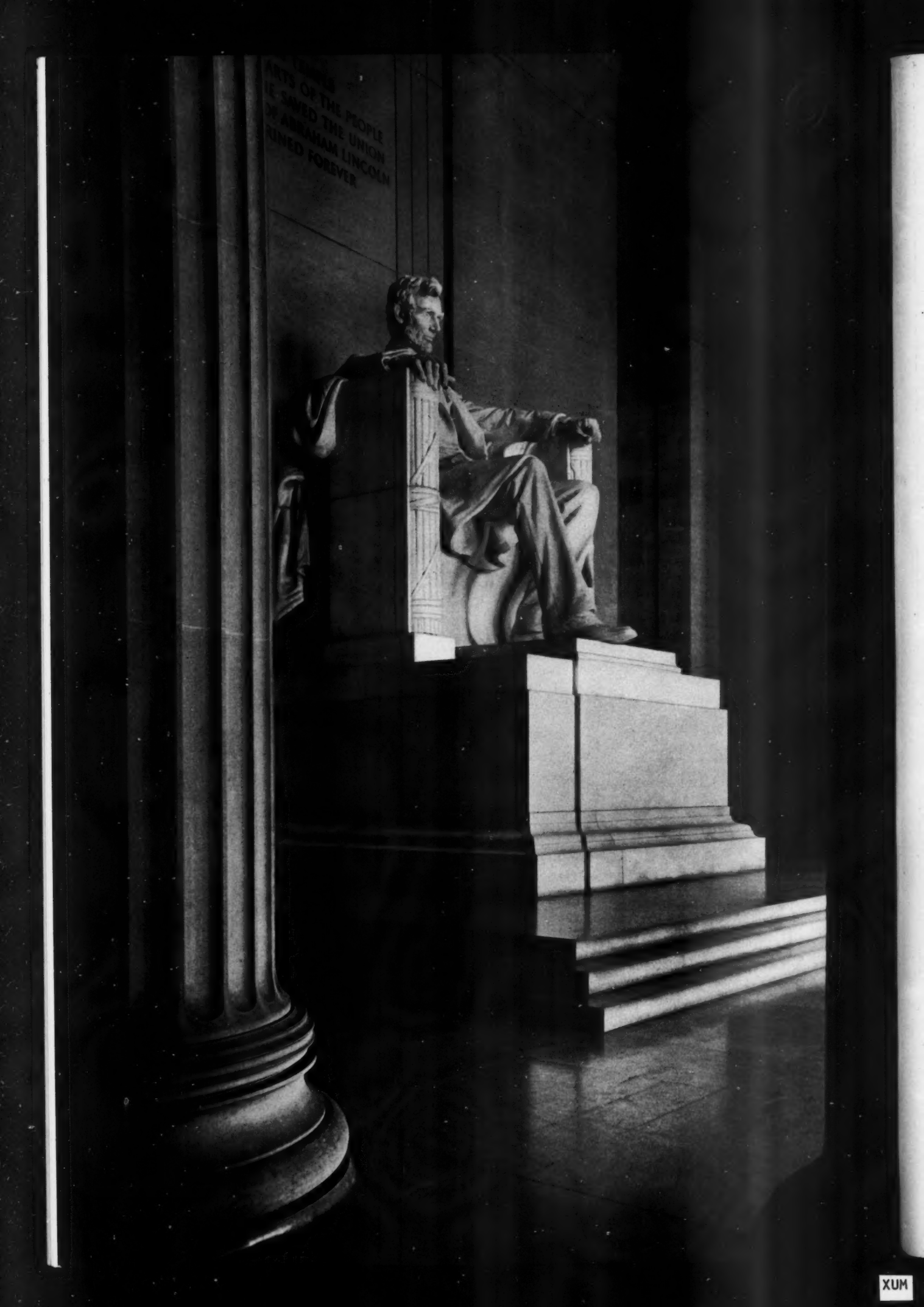
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# Housing Must Be Co-ordinated

BY BENJAMIN F. BETTS, A.I.A.

PRESIDENT ROOSEVELT has advocated the appropriation of billions of dollars for housing and unemployment relief. If Congress approves the recommendation, as it probably will, the question arises—How will the program be administered?

• Three Government agencies are at present concerned with housing. Each is also involved, directly or indirectly, with unemployment relief and with activities intended to aid economic recovery through stimulation of building. It is inevitable that the interlocking aims of each lead to overlapping of functions, confusion of individual interests and the unfortunate lessening of efficient action.

• The Government must distinguish between a permanent housing program and unemployment relief. That is a basic consideration. It is just common sense. To do so would best serve the interests of the Government, the building industry and housing itself.

• Low-rent Housing—the objective of the PWA Housing Division—should be divorced from the present program of slum clearance for the costs of the latter tend to limit practical possibilities for low rents.

• Subsistence Homesteads — an FERA activity—constitute a special type of low-rent housing. They should be regarded as such and not primarily as a means of unemployment relief. They should receive the benefits of a technically expert housing administration.

• Moderate-cost Houses—privately financed—are regarded by FHA as a means of stimulating building. FHA is concerned with financing methods that will permit private capital and owners to meet on common ground. Slum-clearance and low-rent housing projects of a relief nature are outside FHA objectives. Such problems should be solved by other agencies.

• The necessity for low-rent housing on a national scale has been recognized. It is on the way toward realization through the agencies of PWA and FERA. Proper solution of the problem involves the efficient and widespread use of architects and other able experts of the building industry. Only by co-ordinating all Government housing activities under one policy and direction can the desired end be achieved. A permanent Federal Housing Authority should be established without delay.



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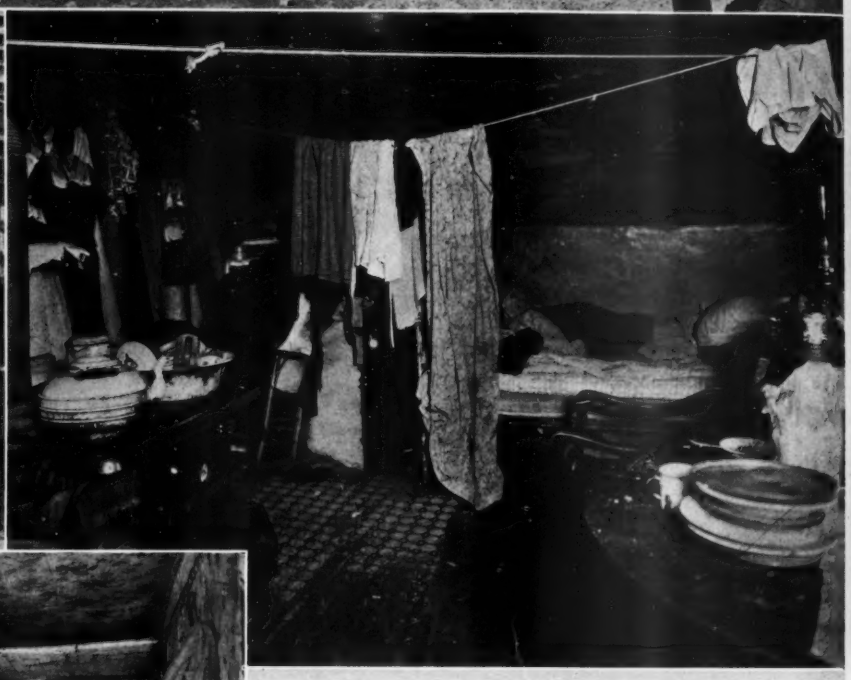

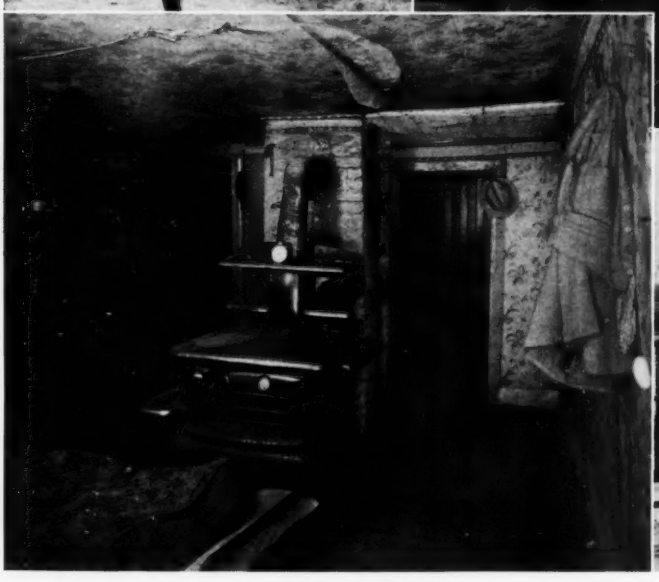

**ELIMINATION** of present conditions is one objective of Government housing activities. Planning Standards for Low-Rent Housing developed by PWA Housing Division are to aid architects in attainment of this ideal. They are presented exclusively on the following pages


# LOW-RENT HOUSING . . .



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# Planning American Standards for Low-Rent Housing

BY ALFRED FELLHEIMER, A.I.A.
Consultant, Housing Division, Public Works Administration

LOW-RENT housing in the United States has been for years the Sphinx's riddle of the building industry. Today, a sound approach, at least, has been made to an ultimate solution of the problem.

Under the leadership of Public Works Administrator Harold L. Ickes, the Housing Division of PWA, charged with the task of working out the nation's first slum-clearance and low-rent housing program, has been marching steadily toward its goal. The Division, of which Colonel Horatio B. Hackett is Director and A. R. Clas, Assistant Director, has put basic policies and plans into action. As a result coming months will show evidence of greater activity in construction and its related industries with low-rent housing projects rising in many sections of the country.

As a means of starting once more the wheels of an idle industrial machine, low-rent housing during the last two years has assumed the significance of a national problem. Only recently has it been approached as such. For some months the Housing Division sorted a maze of unrelated facts figures and fancies about low-rent housing, seeking a sound foundation on which to build. Architecturally, it found such a basis and evolved a cleanly mapped program of procedure in which the private architect looms large as a factor of importance.

Two fundamental problems of a housing program were early recognized by the Division. One was the matter of financing which has blocked the road to low-rent housing. Experts long held some sort of subsidy to be essential if low-rent housing were ever to be more than an impractical dream. Experiences of other nations pointed to the necessity of this expedient. Yet they gave no valid answer to the problem of subsidizing a project in which capital—even with a limited return—could participate. Nor did they indicate a way by which our own building industry could be stimulated through the financial interests of any private agency.

Apparently, the only answer to the double problem of providing industry with work and at the same time creating adequate, low-rent dwellings lay in direct action by a Governmental agency. The opening of this course came with the establishment of the Public Works Administration. As the active arm of this agency the Housing Division was organized and eventually placed under the direction of Colonel Hackett. The Division is now engaged on a program of slum clearance and low-rent housing in which it finances the entire cost of the Federal projects it approves and works out.

Financing of a Housing Division Federal project follows the loan and grant procedure of PWA. The necessary fund for a project is set aside with thirty per cent of the cost of labor and material designated as an outright grant. The remainder is charged against the project and is returned eventually to the Government through amortization of the rent income of the housing development. Thus, the thirty per cent PWA grant in effect constitutes a subsidy.

Of primary interest to architects is the approach of the Division to the second question involved, that of policies relating to participation of private architectural engineering and contractng firms in the program. From the inception of the PWA Housing Division such firms were invited to participate to the fullest possible extent. But difficulties attendant upon the new organization and its analysis of the many phases of a new and intricate problem constituted an embarrassment to architect and official alike. Complications, both technical and administrative were unexpected. The result was an inefficiency that at present has been eliminated.

Today, the administrative technique has been simplified so that the largest feasible number of private architects will participate in PWA's low-rent housing program. In every instance, local organizations and industries will be employed. Already the approval of some thirty projects has been accomplished since last July largely as a result of Colonel Hackett's new policies.

Among the most important contributions to this new and rapid efficiency is the series of planning standards recently developed by the technical staffs of the Housing Division and reproduced in part here for the first time.


LOW-RENT HOUSING, MODEL AT RIGHT, WILL REPLACE THIS TYPICAL INDIANAPOLIS SLUM

BLUM

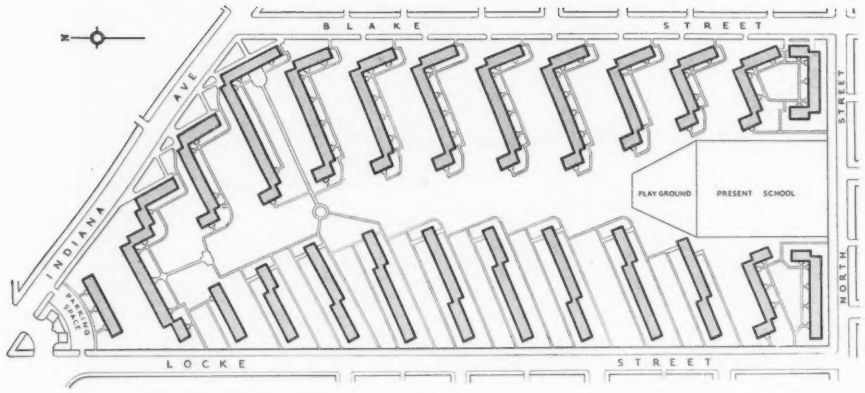
Unit Plans of the PWA Housing Division constitute a guide to well-planned housing projects. They were developed to aid architects in finding solutions to the national problem of Slum-Clearance and Low-Rent Housing

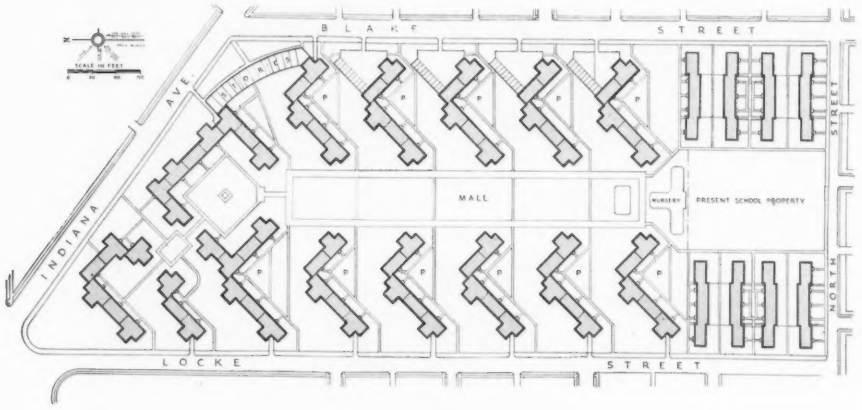
They are the result of an intensive research into the fundamental problems—social, economical and technical—of our national housing problem. They constitute a triangulation point in the Housing Division's program.

## RESULTS OF RESEARCH

FOR some time it has been evident that no adequate technique of low-rent housing existed in this country. European practices, advocated by well-meaning enthusiasts as criteria for our own problems, have only served to confuse technicians and officials alike. Except in special instances there has been no apparent attempt to analyze planning technicalities of our low-rent housing problems in terms of a purely American solution.

Much has been written about the needs of lower income groups for economical, sanitary dwellings: but heretofore the proffered fulfillments of these needs have been largely presented with evident overemphasis of unessentials or an obscurity of the real solution on the side of costs. Former mistakes have




## Planning Standards Applied To SITE PLANNING

**Above:** preliminary layout of row houses on the site of an Indianapolis slum clearance and low-rent housing project.

**Below:** revision of the preliminary site plan. By adapting a combination of the strip, corner and tee plan units developed by the Housing Division the architects have improved the orientation of apartments and the use of the land itself. As planned this layout will cover an area of 17.12 acres. Apartments will be built at one time and will represent a land coverage of 19 per cent. The number of rooms total 2,548. Triangles marked "P" in layout designate playgrounds. William Earle Russ and Merritt Harrison, architects

arisen not from inabilities on the part of anyone concerned, but from a lack of a sound standard by which low-rent housing projects might be checked and judged.

Plans and data that accompany these paragraphs constitute, in effect, a system of measurement. They were primarily developed for the use of the Housing Division staff. It seemed essential, before submitted projects could be approved, that the Housing Division should have a clear understanding of the objectives of low-rent housing. Equally necessary was an intimate knowledge of planning possibilities by which those objectives might be gained. Consequently, an intensive study was made of every conceivable element which might concern the successful development of a low-rent housing venture.

The result of this study is a number of unit plans based upon the graphic analysis of low-rent housing objectives. They are of two essential types, a tee unit and a strip unit. Each type is further classified as to the structural system employed. In one arrangement, columns have been placed exactly midway between exterior walls; in another the columns are placed off-center. Both systems have a variety of advantages and disadvantages; and both represent usual planning practices. Variations in types of plan units are sufficient to allow a wide range of plot planning possibilities well within the boundaries of economical and adequate housing provisions.

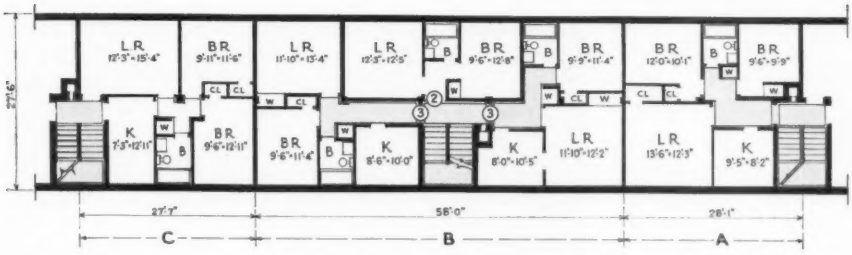
Minimum requirements only have been incorporated in all unit plans. This point should be emphasized. There is no reason to believe that variations in local conditions of site, costs or legal restrictions will permit use of all plan types without change. In every case, plans have been developed with no implication of standardization beyond what has been determined as necessary to the safety, health and comfort of low-rent housing tenants.

In passing to architects the plan studies and low-rent housing data developed primarily for use by its own reviewing staff, the Housing Division implies no mandatory adherence to these minima. Local conditions vary. What may be a rigid code requirement in New York may be an unfortunate violation in Idaho; and a six-foot stairwell in one state will infringe upon another state code that may call for an eight-foot width with no direct entrances allowed to individual apartments from stairwell. Local code restrictions automatically must govern. But aside from such inevitable variations, Housing Division plans represent basic minimum standards of room sizes and arrangements that will normally govern approval of all low-rent housing projects submitted in the future for PWA financing.

Use of the plans by local architects concerned with local housing projects is almost unlimited. A

## Planning Standards Applied To UNIT LAYOUTS

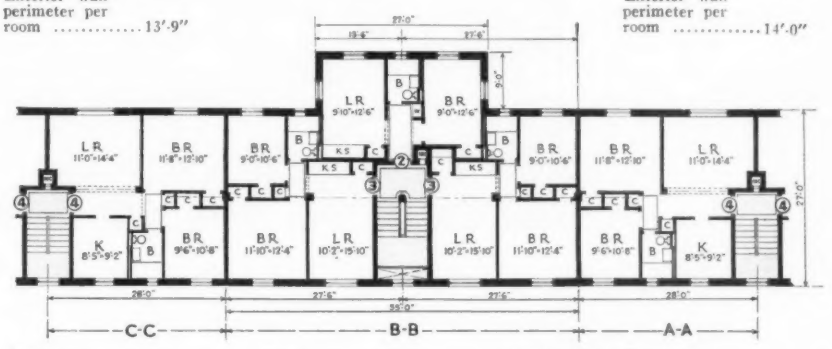
**Above:** preliminary study of a typical strip-type housing plan. Criticisms are: In Plan "A", 1. Two plumbing stacks; 2. No pipe spaces for baths; 3. Inefficient use of space; In Plan "B", Four plumbing stacks; 2. No cross ventilation in two-room apartment; 3. Lack of privacy. In Plan "C", 1. Two entrance doors. **Below:** revision of the preliminary study to embody principles of Housing Division standards. Advantages are: In Plan "A-A", 1. Only one plumbing stack; 2. More privacy; 3. Five feet less interior partitioning. In Plan "B-B", 1. More compact arrangement; 2. Greater privacy; 3. Two-room apartment has cross ventilation. In Plan "C-C", Advantages similar to those noted for Plan "A-A"




Gross area per unit.....758.5 sq. ft.
Average area per room.....189.6 sq. ft.
Interior partitions per room...29'-6"
Exterior wall perimeter per room .....13'-9"

Gross area per unit..... 1595 sq. ft.
Average area per room..... 199.5 sq. ft.
Interior partitions per room.... 26'-10"
Exterior wall perimeter per room 14'-5"

Gross area per unit.....792 sq. ft.
Average area per room.....198 sq. ft.
Interior partitions per room...31'-0"
Exterior wall perimeter per room .....14'-0"




Gross area per unit..... 756 sq. ft.
Average area per room..... 188 sq. ft.
Interior partitions per room... 26'-1"
Exterior wall perimeter per room ..... 14'-0"

Gross area per unit..... 1728 sq. ft.
*Average area per room..... 216 sq. ft.
Interior partitions per room.... 26'-4"
Exterior wall perimeter per room 16'-0"

*Includes strip kitchen

Gross area per unit.....756 sq. ft.
Average area per room.....188 sq. ft.
Interior partitions per room...26'-1"
Exterior wall perimeter per room .....14'-0"

study of those published here will disclose types that will conform to almost any desired arrangement on almost any type of plot. They are presented as an aid to the architect in the solution of his individual problem—a kind of short cut by which an architect can confine his efforts to creation of his own ideas without the time-consuming research necessary to detail the adequacy of a solution.

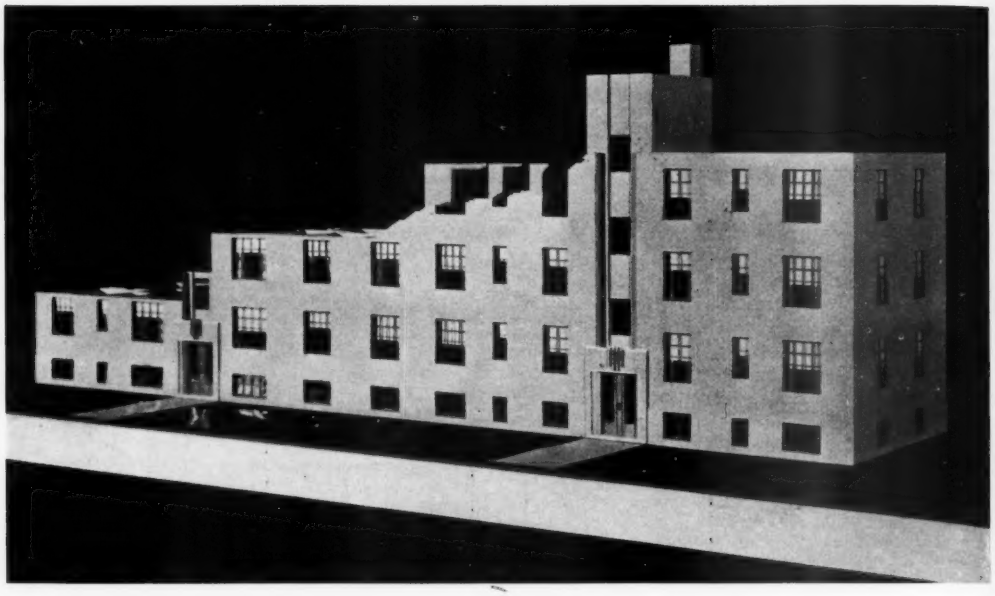
### OBJECTIVES

IN no sense can these plans be considered a final solution. They represent merely the conclusions to date of a searching analysis of the low-rent housing problem from the double standpoint of tenant and builder. Colonel Hackett and every member of his staff hope that from their use will develop even more efficient solutions to one of the most intricate and far-reaching of all architectural problems.

In many of the units themselves and in the ways by which they may be combined to serve local requirements, advocates of European housing techniques may find much to criticize. Others may think that the minimum provisions of the units leave much to be desired in the way of refinement and amenities. The most complete answer to criticism of both kinds is the definition of low-rent housing as it has been adopted by the Housing Division. This is to the effect that low-rent housing implies primarily the most economical type of dwelling that will assure the safety, health and reasonable comfort of its inhabitants.

From this basis the graphic findings of the Housing Division staff resulted. Standards of living in the United States are not the same as those of Europe. Our ways of living are likewise different; and many things bearing upon the layout and equipment of a housing scheme are recognized as essential parts of everyday American life, though there may exist no counterpart for them in Europe.

Analysis of housing needs, therefore, has been made solely in terms of the minimum, decent requirements of American family life. The unit plans that are the graphic result of this analysis can best be regarded as establishing bases from which individual projects may be planned. In no sense do they imply standardization of the projects themselves. On the contrary, any attempt to achieve a regimentation of units beyond the bounds of economical construction or demonstrated local expediency is discouraged by the Housing Division's staff of review. The wide variety of unit plans has been developed to the end that a desirable and basic minimum standard of living can be economically maintained in any housing development, whatever its extent or location.



## STANDARDS

THIS desirable standard of living has been the paramount factor in translating low-rent housing objectives in terms of detailed layouts. These unit plans are emphatically not theoretical demonstrations of technical skill. They embody the highest degree of sound efficiency applied to architectural and structural theory. From sound fundamentals of planning, design, construction and location of equipment were developed certain formulae which govern the characteristics of all plan units.

**1. Economy and flexibility of plan layout without loss of any desirable feature.** A tee plan was found most desirable from this double standpoint, since it permits a greater number of rooms to be served from one set of utilities (stairs, halls, incinerator). In any low-rent housing project the per room cost of building and maintaining these necessary utilities is a factor of importance. From this standpoint alone, the tee shape is preferable, since utility costs are distributed over a greater number of rental units with a consequent lessening of per room costs. The tee plan unites more efficiently than other types, though in a large housing development there must often be included a number of strip units serving as connections for tees. In all types of plans cross ventilation has been held an important factor.

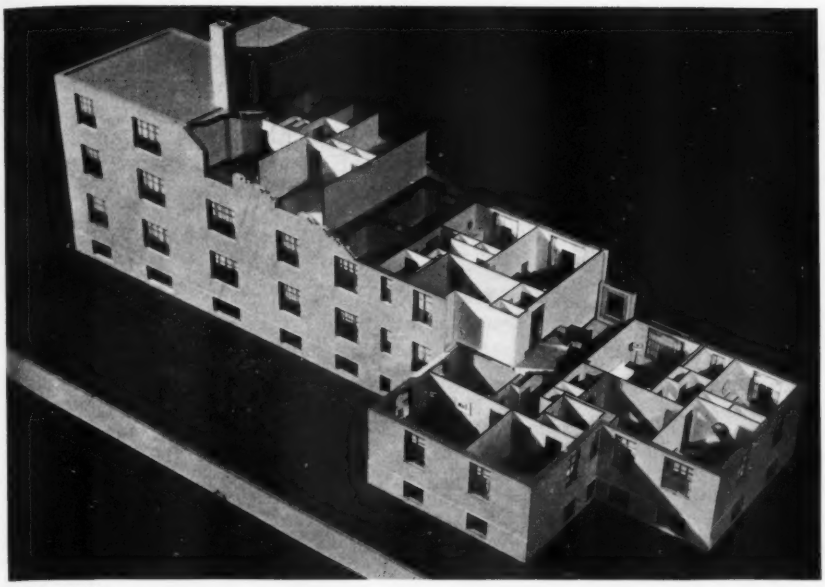
**2. Code of minimum sizes for all rooms, including baths and halls.** All units have been laid out in the plans with an over-all span of 27 feet, a dimension which can be extended depending upon local conditions or factors relating to a specific project. Under the 27-foot plan, approximate minimum areas for rooms are: Living room, 150 square feet; main bedroom, 110 square feet; second bedroom, 100 square feet; kitchen, 70 square feet. In all instances bathrooms have a minimum dimension to take a full 5-foot tub.

**3. Establishing standards for kitchen, bath and mechanical equipment.** Housing is to be electrically lighted and provided with accommodations for radio. Heating arrangements are subject to local requirements. Kitchens are to be planned to include at least combination sink and laundry tray, refrigerator and range, allowing ample space for concealing plumbing pipes and allowing kitchen working space.

**4. Formula for number, sizes and types of closets.** A coat closet, linen closet and at least one closet per bedroom, each with a minimum depth of 1'10" are mandatory. Basement storage requirements vary with the type and location of each project.

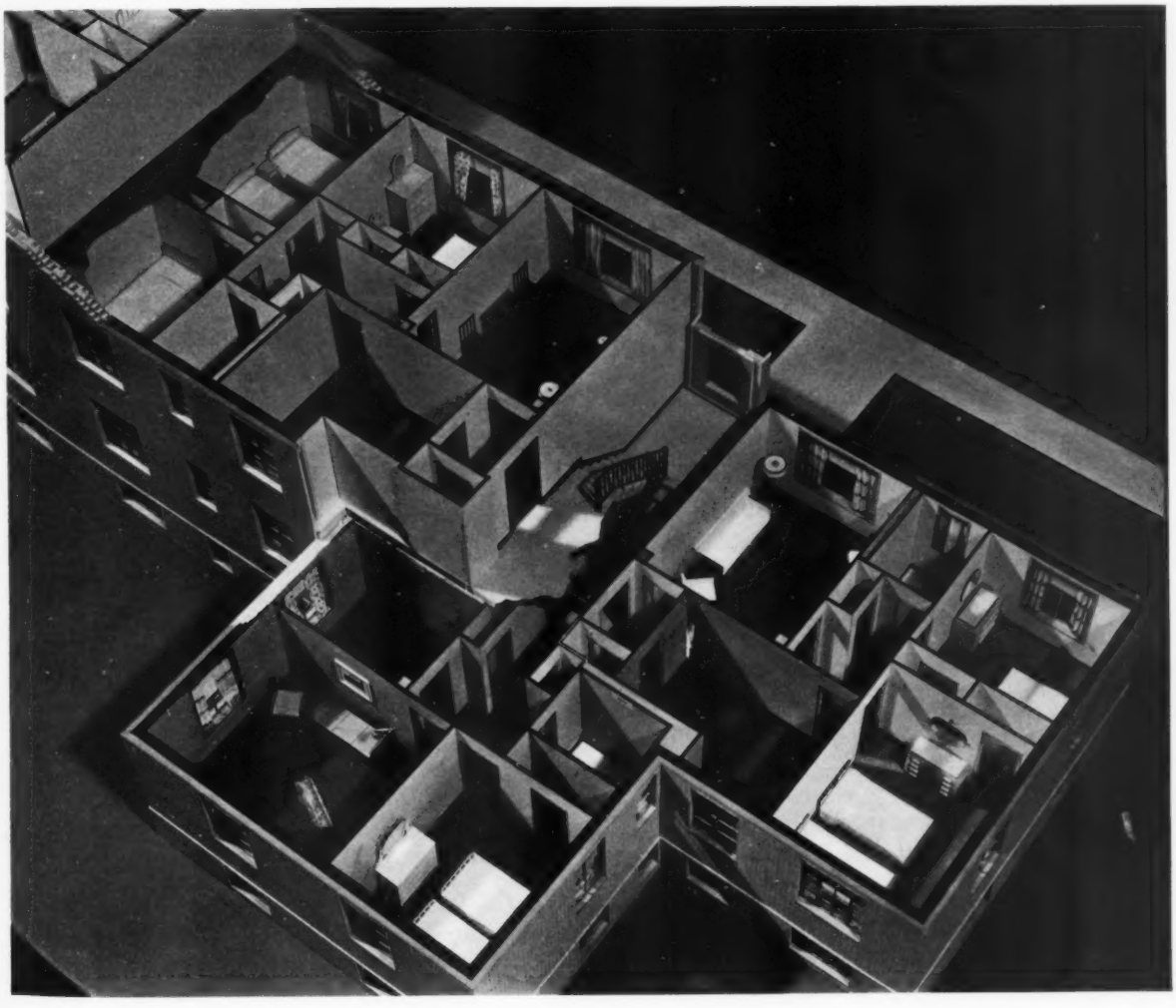
**5. Standardization of door and window sizes, area of stair halls, etc.** Entrance doors are either 2 ft., 8 in. or 2 ft. 10 in.; bedroom doors, 2 ft., 6 in.; bathroom doors, 2 ft.; and closet doors, 2 ft., 4 in. Window sizes may vary somewhat in accordance with the type of exterior design. The necessary minimum glass areas should conform with local code requirements.

**6. Standards, so far as they can be set, for recommended types of construction.** The Housing Division has no wish to impose construction specifications upon architects or owners except insofar as the safety, health and comfort of tenants will be concerned and the Federal Government's investment given reasonable protection. To allow the greatest possible latitude in construction technique two types of column spacing were included in determining various plan layouts. Both types permit almost total concealment of columns and allow beams to be placed directly over partitions, a desirable feature of any structural system.



BLUM PHOTOS

**Models of typical plan** units give a dramatic visualization of the objectives toward which the Housing Division is working. Illustrations on this page show what is believed to be the minimum, decent requirements of an American family's apartment home. Furnishings shown in the model are suggestions only. The elevation shown on the opposite page indicates the desirability of simplicity in design



## THE OWNER'S STANDPOINT

THE Low-Rent housing problem must be approached from two points of view. Standards listed above refer primarily to the safety, health and comfort of the tenant. From the standpoint of the builder or owner another set of conditions must be considered.

Success of any housing development is naturally predicated upon a low percentage of vacancies. This is merely another way of saying that apartments must be attractive and appointed well enough to rent easily and thus insure justification for the financial structure. No amount of financial aid can make certain the success of any housing venture unless, from the viewpoint of prospective tenants, an apartment combines economy with practical means that assure comfortable and convenient living.

To these ends, therefore, another system of architectural standards has been embodied in every plan unit. In general, emphasis has been placed on clean-cut layouts. In practically none of the plans developed by the Housing Division staff is it necessary to pass through the living room to reach the bath or bedroom. Each room has an unbroken perimeter; that is, closets do not cut into them and with the exception of some of the kitchens, all are regular in shape, permitting the most effective and useful arrangement of furniture.

Such an arrangement accomplishes two things. First, it brings the low-rent apartment into the same planning category as the single family house, wherein living rooms are normally segregated in some fashion from service areas such as the kitchen. Thus, a highly desirable privacy is assured within a relatively constricted area. Second, because of this privacy, the living room can be used as an auxiliary bedroom thus increasing the capacity and utility of the apartment.

Even within minimum space allowances, apartments should be arranged so that rooms are in a properly efficient relation to one another. In the Housing Division units this relationship was accomplished, first of all by analyzing the manner in which each room would be used. In the kitchen, for example, space has invariably been allowed for a dining table in a location that will not interfere with the normal functions of the kitchen or with circulation through the entire apartment. Each bedroom has been planned to accommodate the usually necessary pieces of furniture; and in every plan there is a bedroom in which twin beds may be placed without uncomfortable crowding. In two-bedroom plans the second bedroom, though smaller, will easily take a three-quarter bed.

Planning of apartment units in relation to the structural system of column spacing has, in the majority of cases, entirely eliminated interruption of ceilings by beams. In all cases, door clearances are sufficient to take standard trim; and doors to all rooms are placed so as to interfere least with the use of the room and furniture which it contains.

Thus, an approach has been made to low-rent housing units which will fulfill the tenants' demands for comfort and convenience as well as the owner's need for economy of first and maintenance costs, together with the most efficient utilization of space.

## ASSEMBLY OF UNIT PLANS

IT is self-evident that even with many sets of graphic unit standards, it would be impossible to encompass solutions to all individual housing problems or to aid conditions of site or local restriction. Also, it is patently impossible to develop any system of plot planning that might be equally applicable to every situation. Unit plans of the Housing Division can do no more than stimulate the architect to a more generally feasible and economical solution to his own problems. Through an understanding of the standards which they represent, however, the architect's plot-planning problem can be enormously simplified.

As the unit plans, themselves, grew from analysis of the function of an economical, minimum apartment, so the idea of plan units grew from the analysis of many types of general housing schemes. The majority of these are composed of various types of units, some more efficiently planned than others. To the Technical Department of the Housing Division and its consultants, Ernest A. Grunsfeld, Jr. and the writer, it seemed most practical to attack the whole problem from the standpoint of these units. From analysis of general schemes sprang the conclusion that the most generally efficient unit was the tee. The strip unit was recognized as a necessity in many instances and consequently it also was developed in all its most practical potentialities.

In combination, these two units can be used to produce an effective solution to the low-rent housing problem. That this is a relative statement is admitted. No housing scheme will ever attain perfection. Those planners who stress orientation must necessarily sacrifice something of planning economy, highest convenience in room arrangement and, possibly also, an appreciable amount of "livability" as regards appearance. Use of the tee units does lose, in some cases, the benefits of ideal orientation in every apartment. But its compensating advantages should be apparent to every architect who has had even the briefest experience with the technique of any low-rent housing scheme.

Given the preliminary advantages of detailed standards of planning, the architect's job is one of synthesis. Such advantages are presented in the unit plans of the Housing Division. The standards that are embodied in them have been set as the most practical for the rank and file of American families. Given a definite building site, restriction of local codes and limitations of a financial structure, the architect will be able to adapt the suggestions in substantially their present form toward the most efficient solution of his problem.



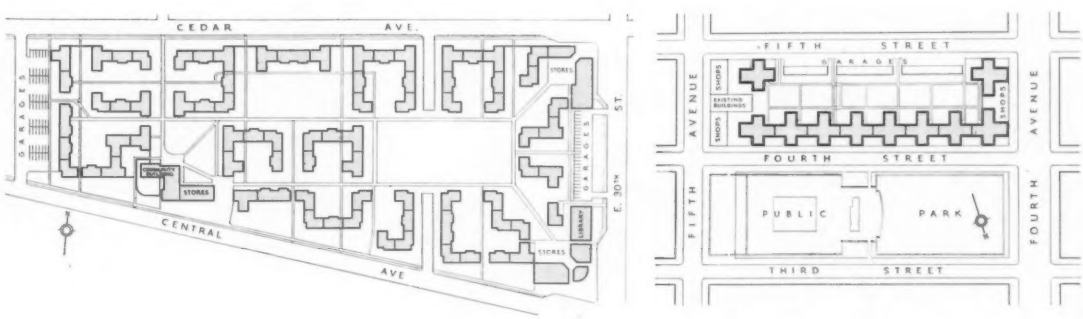
XUM

# Plan Units for Low-Rent Housing

**DEVELOPED BY THE TECHNICAL STAFF AND THE HOUSING CONSULTANTS OF THE PWA HOUSING DIVISION**

The thirty-seven plans shown on the following pages constitute a graphic system by which development of individual housing projects may be aided. Except as indicating minimum room sizes, formulae for equipment and provision for service areas, none of the plans are to be considered as final solutions of any low-rent housing problem. In some instances local restrictions may prevent the use of them as shown. In other cases it may be possible to improve on the facilities provided without increased costs.

Classification of the plans is by shape, since this factor largely controls site planning. Basic types are strip and tee units. Variations of strip units include protruding bays, to permit cross-ventilation in two-room apartments, and depressed bays to provide balconies between apartments. Variations of tee units include the cross plan and two types of corner plans. None of the units are planned for use in elevator apartment projects. Heights are considered to be four stories, a fifth story pent-house apartment being possible from the use of certain of the tee units. Spans of all plan units measure twenty-seven feet from exterior faces of outside walls.




Site plans of two low-rent housing projects approved by PWA Housing Division. Each was based upon the use of standards embodied in the Housing Division's plan units. Left, Cedar-Central Project, Cleveland, Ohio, uses strip, tee and corner units. Walter R. McCornack, architect. Right, Brooklyn Polytechnic Project, Brooklyn, N. Y., uses only a combination of cross plan units. Mayers, Murray and Phillip, architects

# Plan Units for Low-Rent Housing

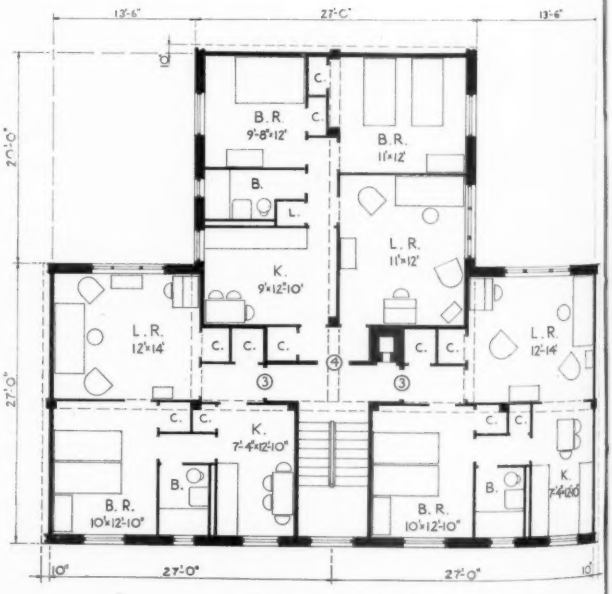
## Developed by the Technical Staff of the PWA Housing Division as aids to the solution of low-rent housing problems

American Architect for February, 1935


1 UNIT 5 · 4 · 5
Total gross area per unit 2650 sq ft
Average gross area per room 189 sq. ft.


2 UNIT 3 - 3s - 3
Total gross area per unit - 1904 sq. ft.
Average gross area per room - 211 sq. ft.


3 UNIT 3·3·3 "A"
Total gross area per unit - 1818 sq. ft.
Average gross area per room-202 sq. ft.




4 UNIT 3·4·3
Total gross area per unit - 1998 sq. ft.
Average gross area per room - 200 sq. ft.

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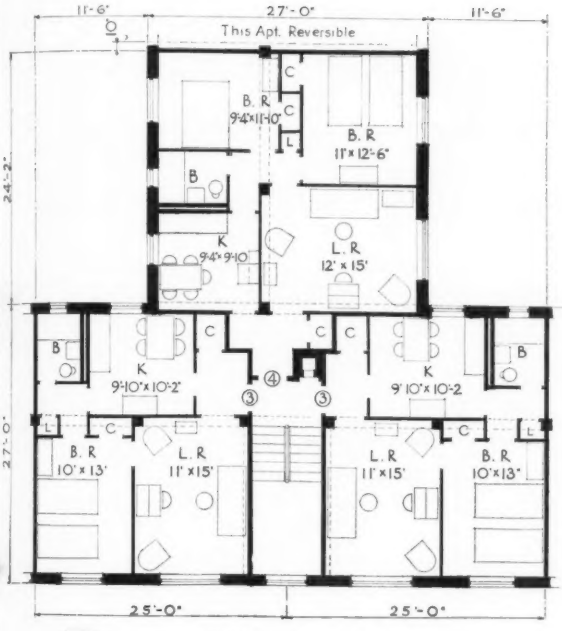
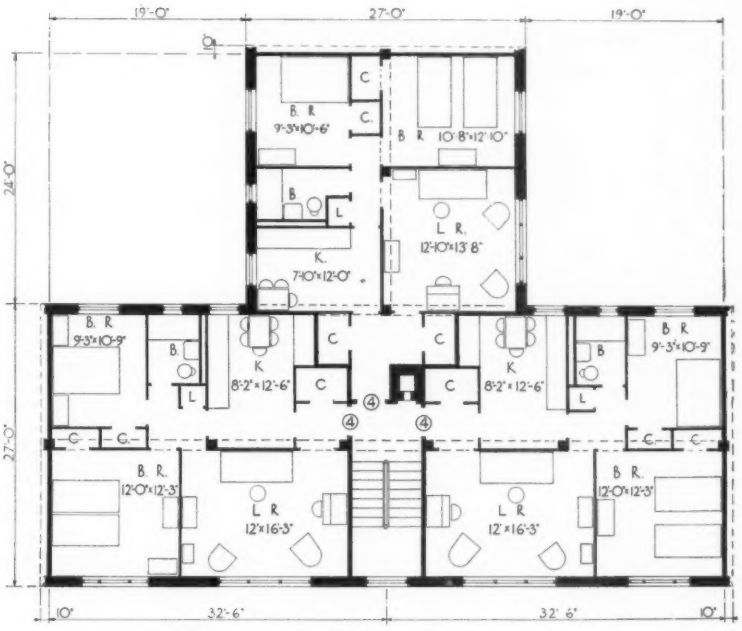
## TEE UNITS

Scale as shown: one-sixteenth of an inch equals one foot. Units shown on this and the opposite page are planned for connection with other units, though end walls can be built on any of the branches. Except where noted, apartments opposite stairs can be used for a fifth-story pent-house. Most are reversible

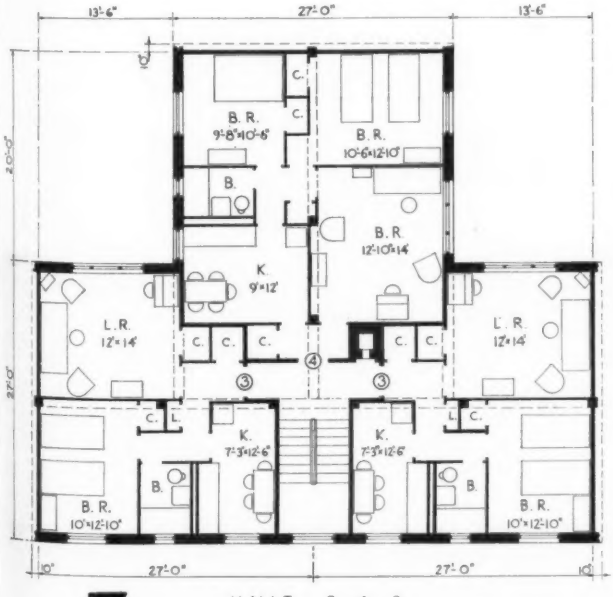
American Architect for February, 1935




5 UNIT - 3 4 3
Total gross area per unit - 2002 sq. ft
Average gross area per room - 200 sq. ft.




6 UNIT 4 4 4
Total gross area per unit - 2403 sq. ft
Average gross area per room - 200 sq. ft




7 UNIT 3 4 3
Total gross area per unit - 1998 sq ft
Average gross area per room - 200 sq. ft


8 UNIT 4 4 4
Total gross area per unit - 2327 sq ft
Average gross area per room - 194 sq ft

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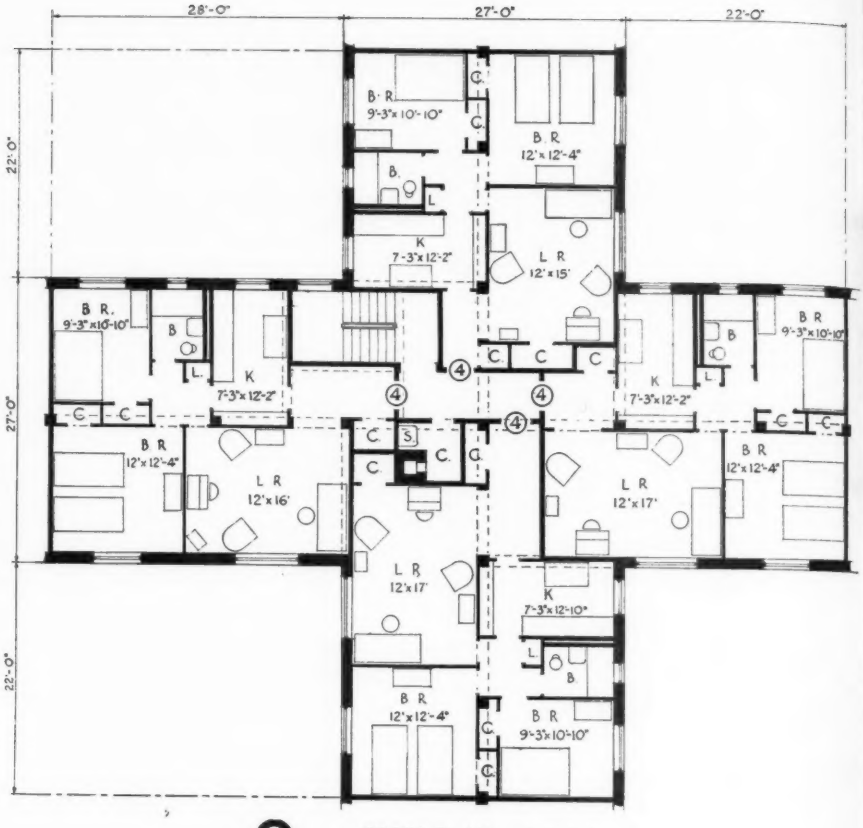
## TEE UNITS

### Plan Units for Low-Rent Housing Developed by the Technical Staff of the PWA Housing Division

Scale as shown: one-sixteenth of an inch equals one foot. Units on this page are planned for connection with others. All tee units may be built with free ends. Cross plan units are the most economical variation of tee plans, since four apartments are served from one set of utilities (stairs, incinerator, halls)

**American Architect for February, 1935**




**9** CROSS PLAN 4·4·4
Total gross area per unit - 3267 sq ft
Average gross area per room - 204 sq ft


**10** UNIT 5·4·5
Total gross area per unit - 2754 sq ft
Average gross area per room - 197 sq ft

# TEE AND STRIP UNITS

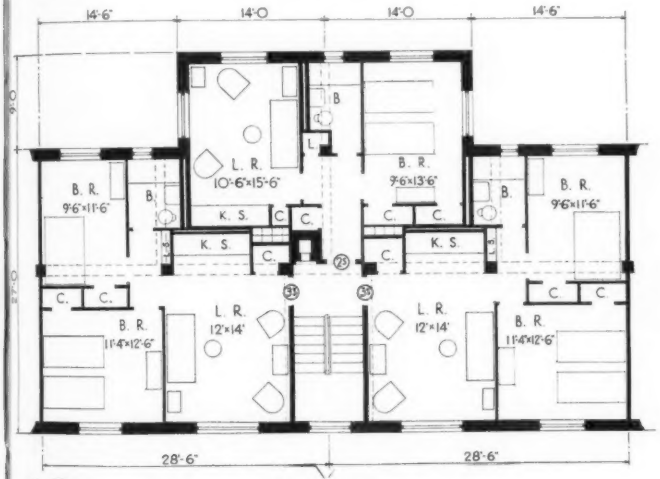
## Plan Units for Low-Rent Housing Developed by the Technical Staff of the PWA Housing Division

Scale as shown: one-sixteenth of an inch equals one foot. Units 11, 13 and 14 are tees used with closed ends on the leg apartments as a variation of strip plans. Unit 12 is essentially a strip plan. The projecting bay allows cross circulation in the two-room apartment. K.S. indicates a kitchen-strip in place of the usual room

American Architect for February, 1935

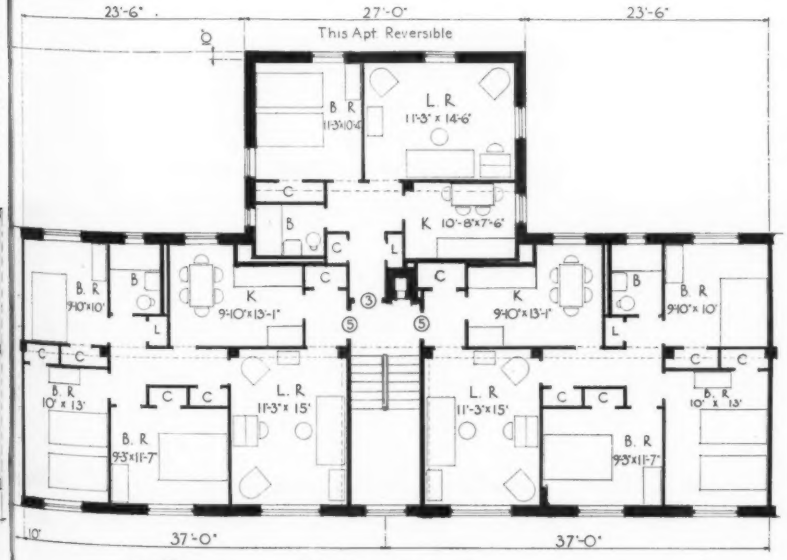

11 UNIT 4 3 4

Total gross area per unit - 2146 sq ft
Average gross area per room 195 sq ft



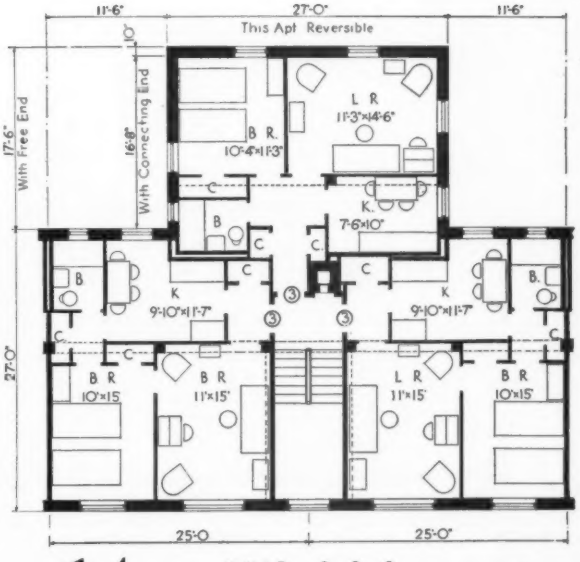

12 UNIT 3s · 2s · 3s

Total gross area per unit - 1781 sq. ft.
Average gross area per room - 223 sq. ft




13 UNIT 5 · 3 · 5

Total gross area per unit - 2470 sq ft
Average gross area per room 190 sq. ft.




14 UNIT 3 · 3 3

Total gross area per unit - 1822 sq ft
Average gross area per room - 202 sq. ft

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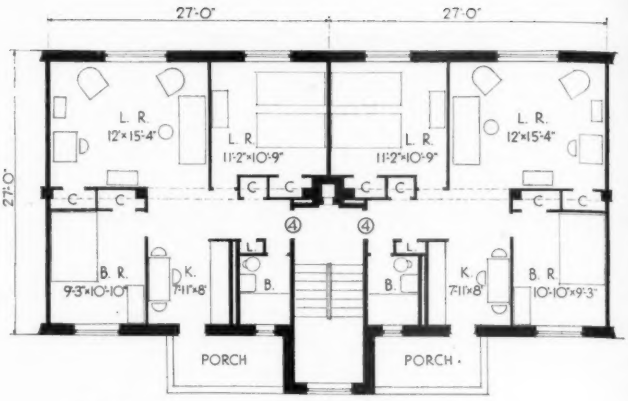
## STRIP AND TEE UNITS

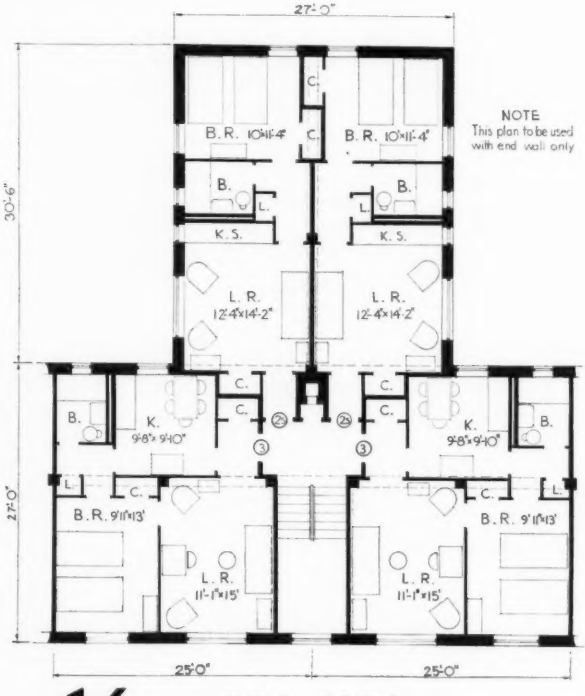
### Plan Units for Low-Rent Housing Developed by the Technical Staff of the PWA Housing Division

Scale as shown: one-sixteenth of an inch equals one foot. Unit 16 is a variation of the tee plans, connection being possible only on branches of the tee. Of the strip plans shown on this page, Unit 19 is the most economical since three apartments are served from one set of utilities (stairs, incinerator, halls)

**American Architect for February, 1935**

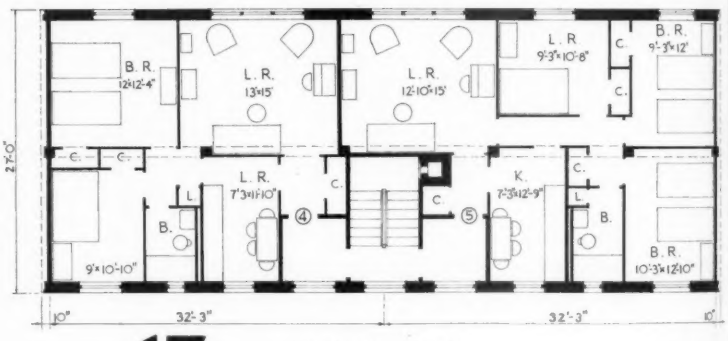



**15** UNIT 4-4
Total gross area per unit - 1568 sq. ft.
Average gross area per room - 196 sq. ft.

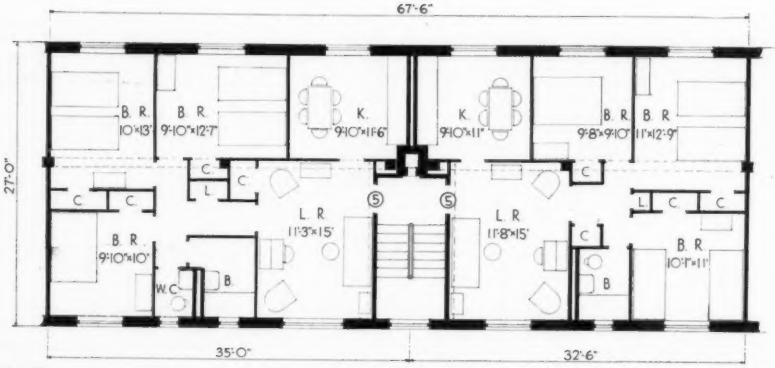



NOTE
This plan to be used with end wall only

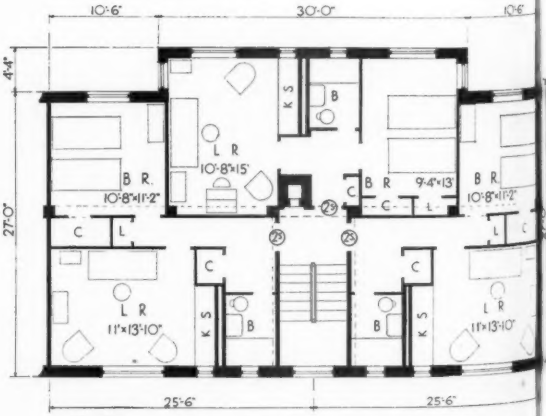
**16** UNIT 3·2s·2s·3
Total gross area per unit - 2174 sq. ft.
Average gross area per room - 217 sq. ft.




**17** UNIT 4·5
Total gross area per unit - 1768 sq. ft.
Average gross area per room - 196 sq. ft.




**18** 35'-0" UNIT — UNIT 5-5 — 32'-6" UNIT
35'-0" UNIT: Total gross area per unit 945 sq. ft. Average gross area per room 189 sq. ft.
32'-6" UNIT: Total gross area per unit 878 sq. ft. Average gross area per room 175 sq. ft.




**19** UNIT 2s 2s 2s
Total gross area per unit - 1507 sq. ft.
Average gross area per room - 251 sq. ft.

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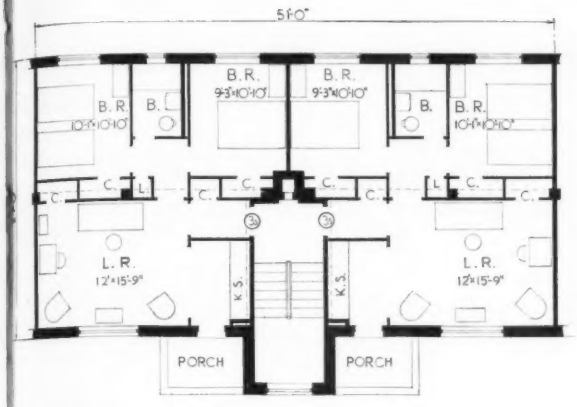
## STRIP UNITS

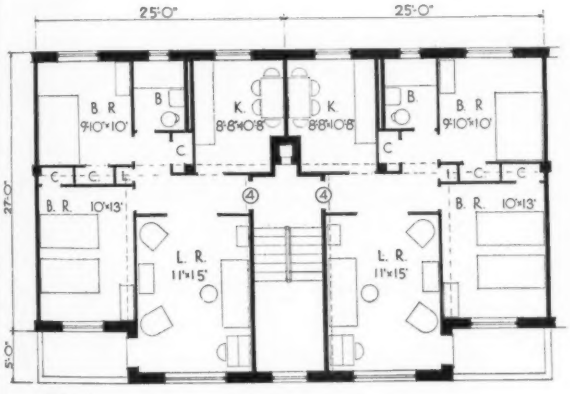
### Plan Units for Low-Rent Housing Developed by the Technical Staff of the PWA Housing Division

Scale as shown: one-sixteenth of an inch equals one foot. Units 20, 21 and 22 indicate possibilities of incorporating porches as variations of the strip plan. Note particularly the unusual arrangement of the two-room apartment in Unit 22. This is an economical layout, since one stair serves three apartments

**American Architect for February, 1935**

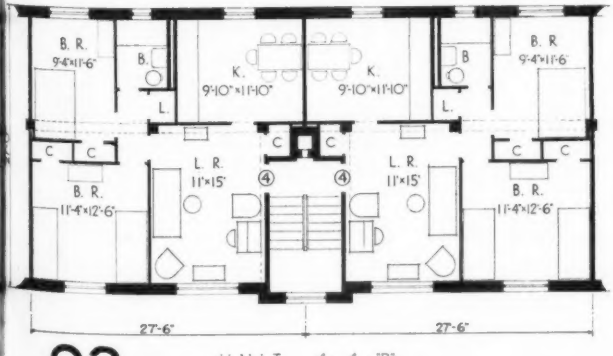



20 UNIT 3s - 3s
Total gross area per unit - 1425 sq. ft.
Average gross area per room - 178 sq. ft.
Porches not included

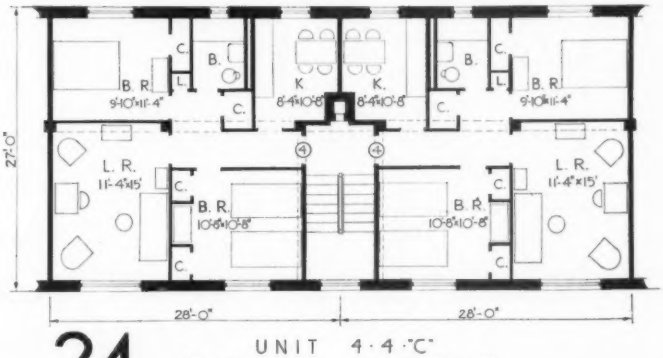



21 UNIT 4-4
Total gross area per unit - 1506 sq. ft.
Average gross area per room - 188 sq. ft.


22 UNIT 3 · 3 · 3
Total gross area per unit - 1793 sq. ft.
Average gross area per room - 199 sq. ft.




23 UNIT 4 · 4 · "B"
Total gross area per unit - 1494 sq. ft.
Average gross area per room - 187 sq. ft.




24 UNIT 4 · 4 · "C"
Total gross area per unit - 1512 sq. ft.
Average gross area per room - 189 sq. ft.

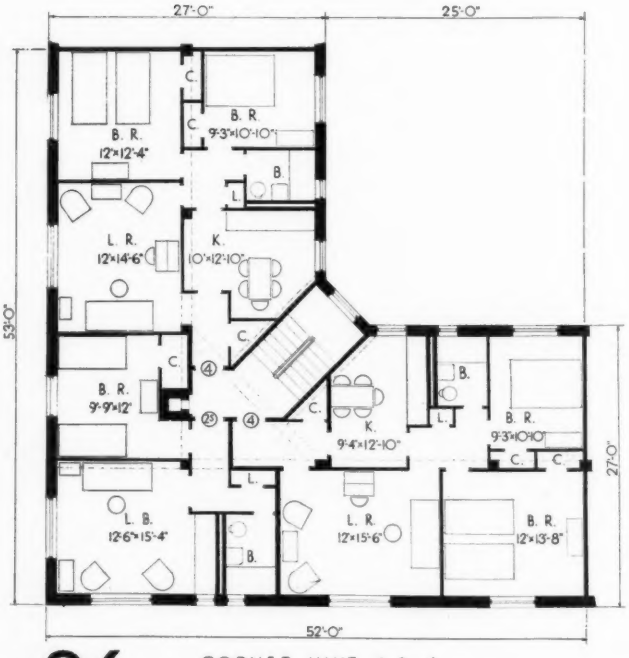
XUM

# CORNER UNITS

## Plan Units for Low-Rent Housing Developed by the Technical Staff of the PWA Housing Division

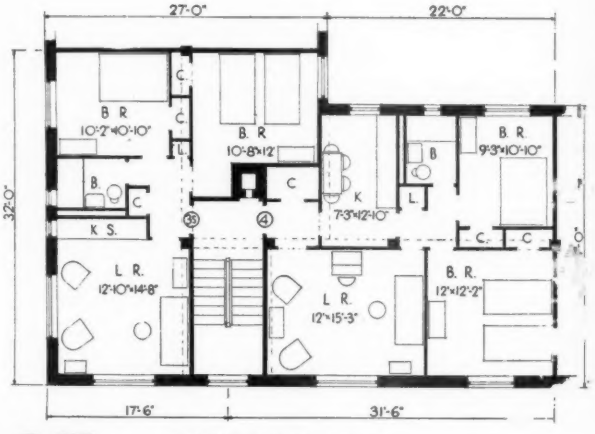
Scale as shown: one-sixteenth of an inch equals one foot. For connection with tee or strip units. Units on this page illustrate methods of turning corners with stairs and entrances on either side. Choice of units depends upon controlling conditions of the site

**American Architect for February, 1935**




**26** CORNER UNIT 4·2s·4
Total gross area per unit 2114 sq. ft
Average gross area per room 212 sq. ft.


**25** UNIT 3·4
Total gross area per unit 1462 sq. ft
Average gross area per room 208 sq. ft




**27** CORNER UNIT 3s-4
Total gross area per unit - 1458 sq ft
Average gross area per room - 208 sq ft


**28** CORNER UNIT 3 2s 3
Total gross area per unit - 1711 sq. ft
Average gross area per room - 214 sq ft


**29** CORNER UNIT 3·4
Total gross area per unit - 1440 sq ft
Average gross area per room - 205 sq ft

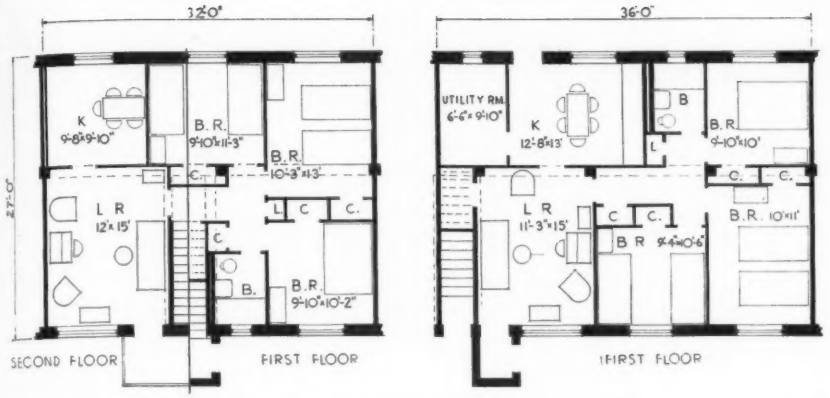
XUM

# ROW HOUSE UNITS

## Plan Units for Low-Rent Housing Developed by the Technical Staff of the PWA Housing Division

Scale as shown: one-sixteenth of an inch equals one foot. These units can be combined in a variety of ways to avoid monotony of site lay-out. Spans are similar to those of apartment units. Thus, they may be combined with tees, strips and corners having off-center columns

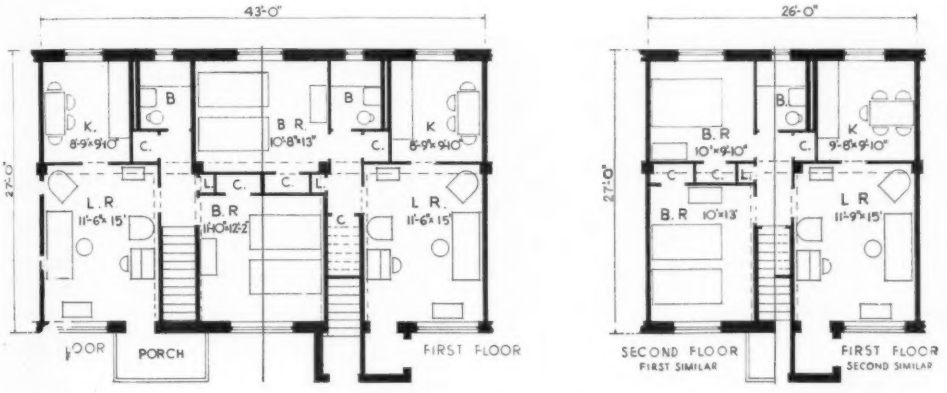
American Architect for February, 1935




30 TWO-STORY FLATS 31

FIVE ROOM FLAT
Total gross area per unit - 886 sq ft
Average gross area per room - 177 sq ft

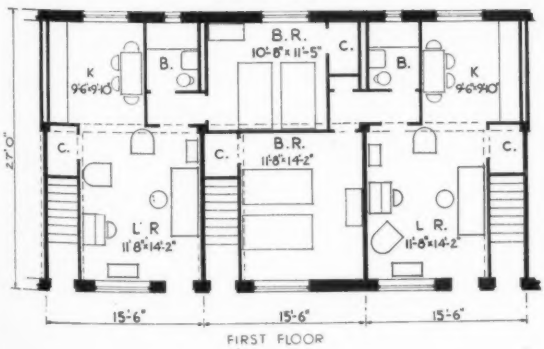
FIVE ROOM FLAT
Total gross area per unit - 996 sq ft
Average gross area per room - 199 sq ft




32 TWO-STORY FLATS 33

THREE ROOM FLATS
Total gross area per unit - 1188 sq ft
Average gross area per room - 198 sq ft

FOUR ROOM FLAT
Total gross area per unit - 729 sq ft
Average gross area per room - 182 sq ft

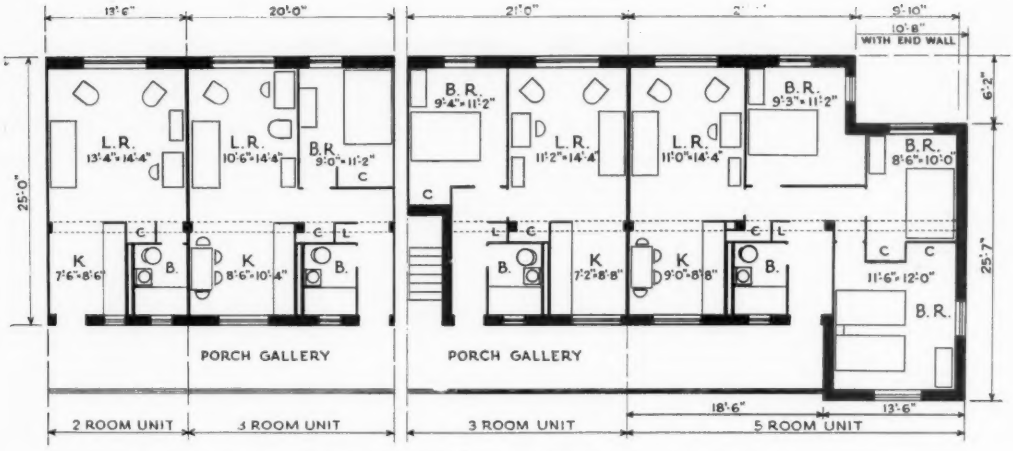

# 34

## 3 & 4 ROOM HOUSES IN THREE STORIES

Total gross area per unit - 3767 sq. ft
Average gross area per room - 209 sq. ft.

Interlocking 3 room houses
Can be used on First Floor

XUM




## 35 GALLERY TYPE APARTMENT

TOTAL GROSS AREA = 2175 SQ. FT.
AVERAGE GROSS AREA PER ROOM = 167 SQ. FT.
GALLERY NOT INCLUDED



## 36 TWO STORY ROW HOUSES 37

4 ROOM ROW HOUSE
Total gross area per unit - 837 sq. ft.
Average gross area per room - 209 sq. ft.

4-5 ROOM ROW HOUSES
Total gross area per unit - 1890 sq. ft.
Average gross area per room - 210 sq. ft.

## GALLERY APARTMENT AND ROW HOUSE UNITS

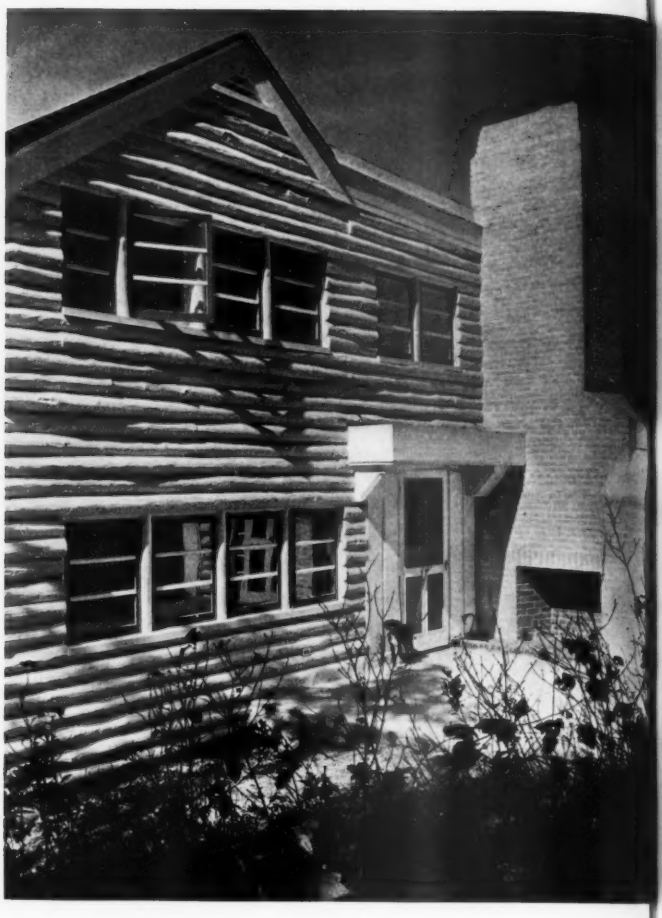
**Plan Units for Low-Rent Housing Developed by the Technical Staff of the PWA Housing Division**

Scale as shown: one-sixteenth of an inch equals one foot. Unit 35 cannot be combined with others since the span is less than the 27-foot standard. Units 36 and 37 can be combined with units on the preceding page or with apartment plans having similar column arrangements

## ALLAN TAFT SQUIRE, ARCHITECT

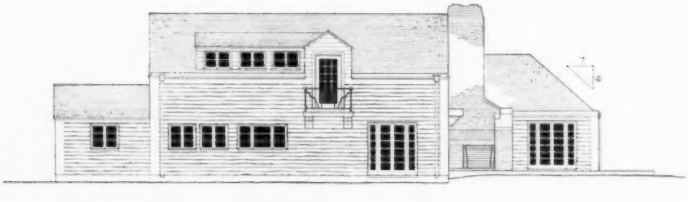
**HOUSE OF DENNY BRERETON**
**GREENWICH, CONNECTICUT**

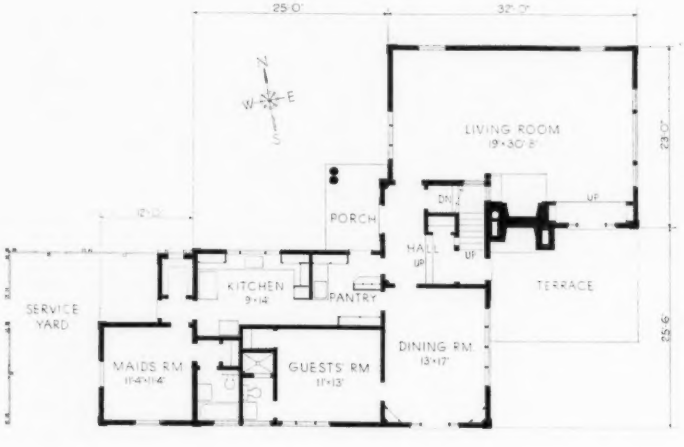
Photographs by Samuel H. Gottscho

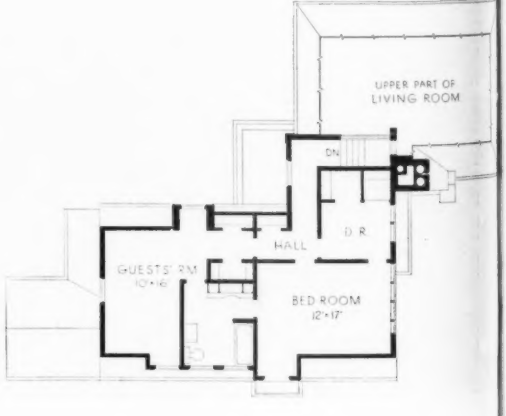


HOUSE OF DENNY BRERETON
GREENWICH, CONNECTICUT

ALLAN TAFT SQUIRE, ARCHITECT





HOUSE OF
DENNY BRERETON
GREENWICH, CONN.

ALLAN TAFT SQUIRE,
ARCHITECT

HOUSE OF
DENNY BRERETON
GREENWICH, CONN.
ALLAN TAFT SQUIRE,
ARCHITECT

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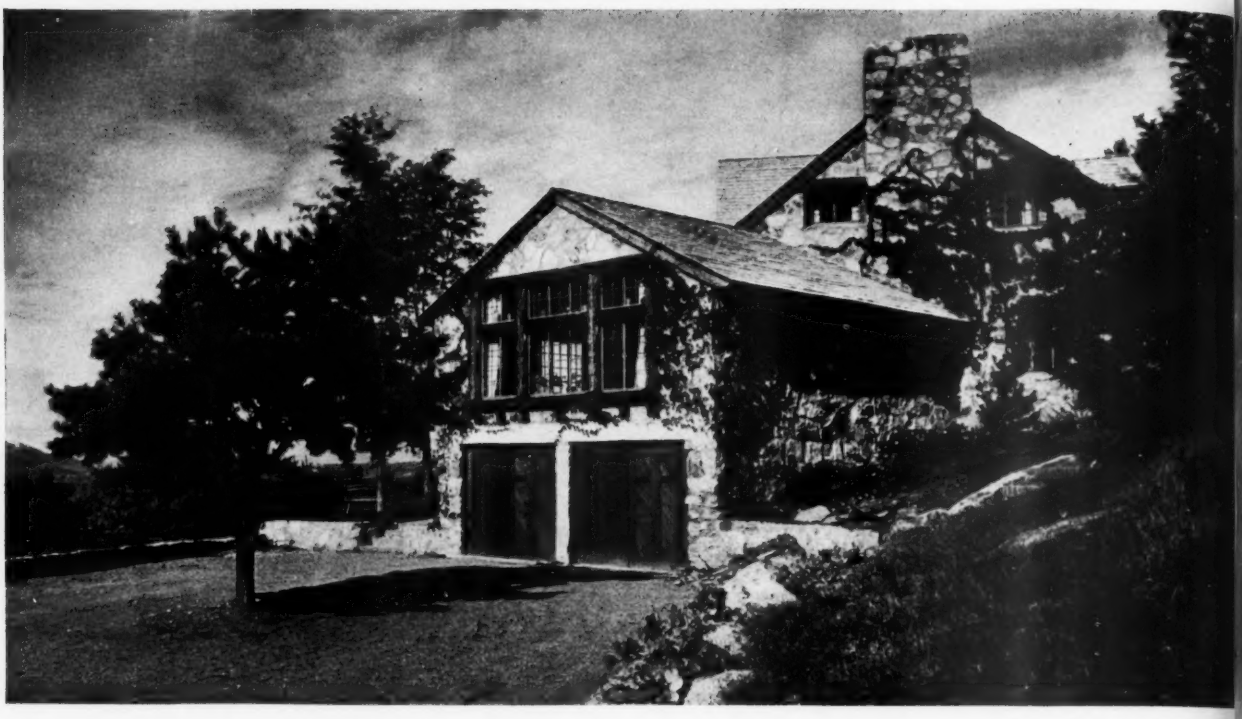
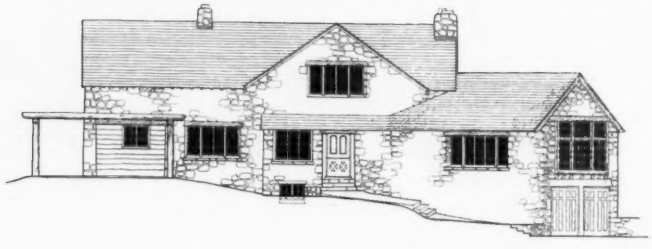
KANSAS

RALPH S. TWITCHELL, ARCHITECT

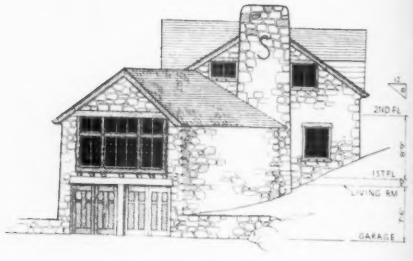
HOUSE OF COREY FORD, FREEDOM, N. H.

Photographs by Robert Maclean Glasgow





SOUTH ELEVATION



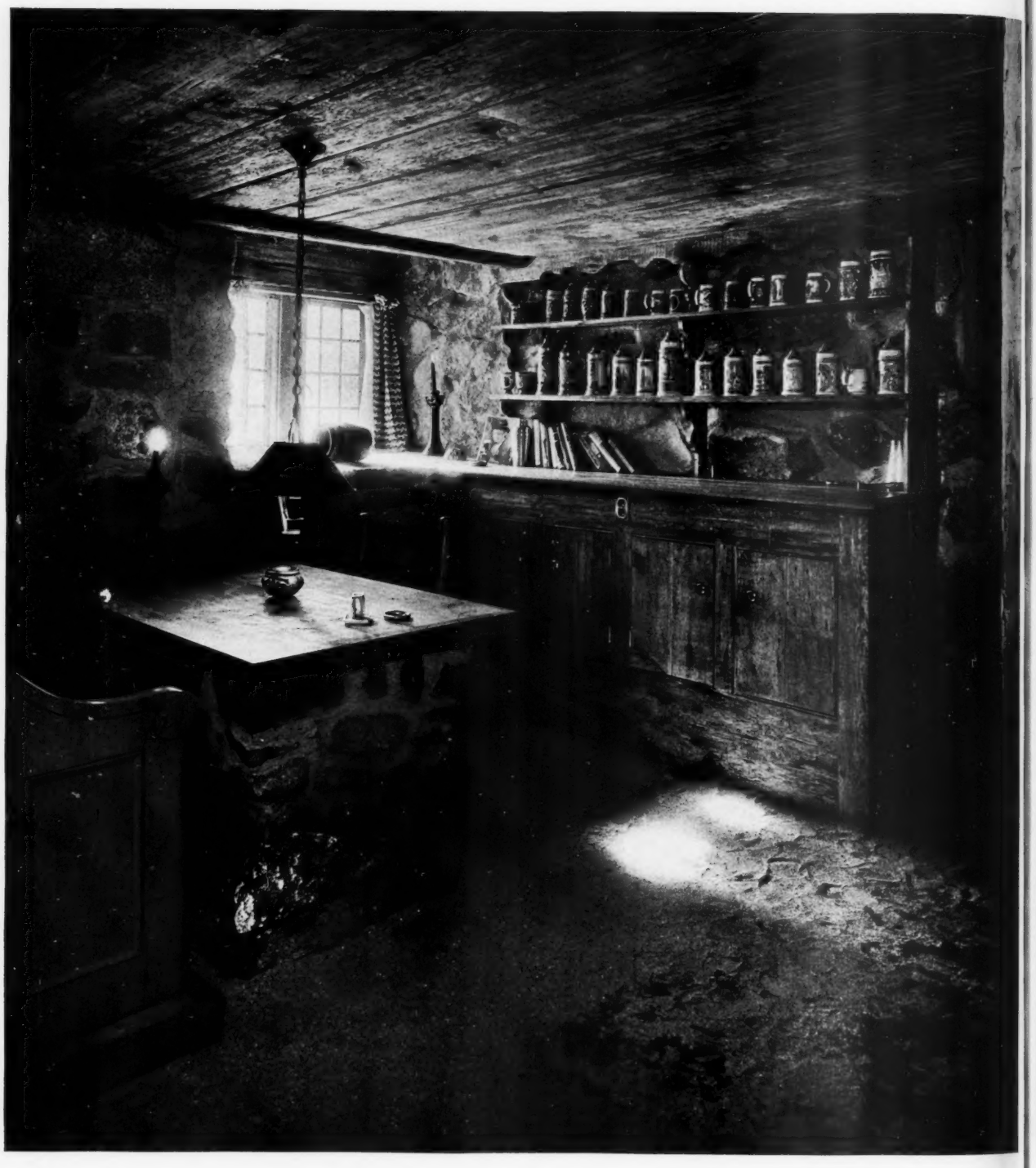

EAST ELEVATION


FIRST FLOOR PLAN


SECOND FLOOR PLAN

Construction: frame, old hand-hewn oak and chestnut; solid masonry walls. Roof, black handscraped asbestos shingles

HOUSE OF COREY FORD, FREEDOM, N. H., RALPH S. TWITCHELL, ARCHITECT



Above: basement tap room. Walls, rubble masonry; woodwork and ceiling, weathered wood; floor, worn brick. The seat is an old church pew. On facing page; the large studio

HOUSE OF COREY FORD, FREEDOM, N. H., RALPH S. TWITCHELL, ARCHITECT

Above: fireplace alcove in living room. Hearth is split granite. Right: dining room. Floors throughout are random oak. Plaster finished with rubber glove and brush. Predominant colors of decorative scheme: weathered wood, coral and dusty blue

**HOUSE OF COREY FORD, FREEDOM, N. H.**

**RALPH S. TWITCHELL, ARCHITECT**

# A Time-Saving Method of Cost Analysis

BY ORLANDO B. LITTLE

INTEREST of the architect in the financial problems of his clients is today a professional matter of importance. Efficiency of preliminary planning solutions usually is determined by successful solution of problems dealing with interest bearing loans. The costs of financing are often important enough to determine the success or failure of the project.

To assist architects in finding preliminary solutions to many commonly met financing problems a Chart of Financing Costs is reproduced on the facing page. A little practice will enable any architect to arrive quickly and easily at answers to many questions involving the size and number of payments, rates of interest, total costs of various interest rates and others that relate to construction loans. Explanation of a few typical problems will clarify the methods of using the chart.

**PROBLEM 1:**
**To Find the Size of Periodic Payments**

A LOAN of $200,000 must be paid back in 15 years; money can be secured at 6 per cent. What amount must be set aside in making the financial "setup" of the building in order to pay off the principal, with interest, in the time required by the owner?

**Solution:** From left of the chart at 15, the number of payment periods follow this line to the right to the 6 per cent interest curve. In line with the intersection, the bottom of the chart will show that a periodic payment of $.103 is necessary to pay off each dollar of loan with interest. This amounts to a total annual charge of $20,600 on a loan of $200,000.

**PROBLEM 2:**
**To Find the Number of Periodic Payments**

HOW long it will take to pay back a loan bearing interest at 7 per cent figured semiannually, payments of 1 per cent of the loan to be made monthly and deducted from the principal and accumulated interest each six months.

**Solution:** Payment of $.01 on each dollar of principal per month will equal $.06 on each dollar, to be deducted from the principal, with accumulated interest, semiannually. Starting at the .06 line at the bottom of the chart, follow it vertically to the curve of 3½ per cent, or half the annual interest charge. (See note under the chart.) A number to the left from this point will indicate the number of payment periods. Approximately 25 will be necessary. Since this is a semiannual basis it will take 12½ years to pay off the loan.

**PROBLEM 3:**
**To Find the Rate of Interest**

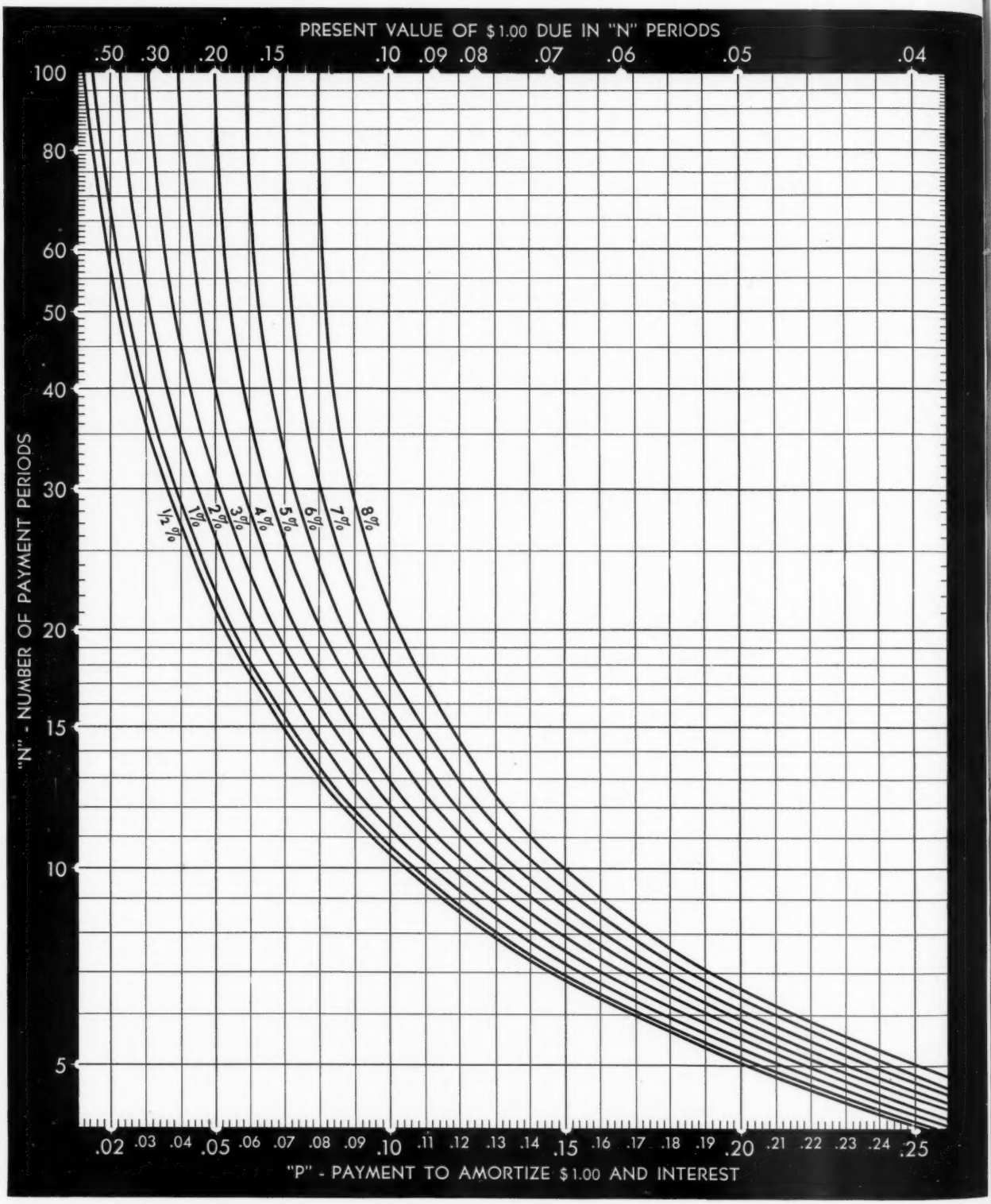
AT what rate of interest must money be secured to pay off a loan of $150,000 in 25 years if a $10,500 payment is made annually?

**Solution:** $10,500 ÷ $150,000 = .07, the annual payment required to pay off each dollar of the loan. A vertical line from .07 at the bottom of the chart and a horizontal line from 25 on the left intersect on the 5 per cent line. Therefore, money should be secured at a 5 per cent rate.

**PROBLEM 4:**
**To Find the Outstanding Principal at Any Time**

HOW much is still owing on the loan in problem 3 after the twelfth payment has been made?

**Solution:** 25 — 12 = 13, the number of payments still to be made. A vertical line from the inter-




**TIME SAVER CHART OF FINANCE AND COSTS**

"P" (Periodic Payment) = Principal $\frac{\text{Interest}}{1-(1+\text{interest})^{-N}}$. If payments are made and interest figured semi-annually, use one-half annual interest rate for required number of payments, "N". If payments are made and interest figured quarterly, use one-fourth annual interest rate for required number of payments, "N"

section of the horizontal line N 13 and the 5 per cent interest line, shows .106. The annual payment of 10,500 divided by .106 equals $99,999 +, or approximately $100,000, the amount still owing on the loan.

**PROBLEM 5:**
**To Find the Total Interest Cost of a Loan**

WHICH will finally be most economical: to borrow $100,000 at 5 per cent interest, to be paid in 30 equal annual installments, or to borrow the same amount at 6½ per cent to be paid in 20 equal annual installments, interest in both cases to be added?

**Solution:** By the method of Problem 1, the annual payment required to amortize a loan of $100,000 at 5 per cent in 30 years will be $6,500. (30 × $6,500) —$100,000 = $95,000, the interest cost. Similarly the annual payment required to amortize a $100,000 loan at 6½ per cent interest in 20 years will be $9,100. (20 × $9,100) —$100,000 = $82,000. Thus approximately $13,000 will be saved by paying the higher interest rate for the shorter period of time.

**PROBLEM 6:**
**To Find the Cost of Prolonging the Life of a Product**

THIS problem has to do with the influence which the length of life of a product or material has upon its ultimate cost, a phase of construction costs which has been given little if any consideration by many architects. Suppose that in making preliminary estimates of the cost of a house, the architect finds that a roof with a probable life of ten years will cost $650. On that basis he wants to know what his client is justified in paying, with money worth 4 per cent, for a roof which will last indefinitely.

**Solution:** At the intersection of the horizontal line N equals 10 and the 4 per cent interest line follow the vertical line to the bottom of the chart and read 0.123 which is the annual cost of each dollar of roof. Multiplying the cost of the roof by this, gives $79.95, the total annual cost of the cheap roof. $79.95 ÷ .04 = $1,999.00, the amount that will produce $79.95 at 4 per cent. Therefore, approximately $2,000.00 is the most the owner would be justified in putting into a permanent roof; and any lower cost for the permanent roof would be a direct saving to him.

Usefulness of this chart is not limited to problems of finance dealing with large projects. It is equally as applicable to those that concern the small house.

For example, a young couple with an annual income of $2,500 wish to own a house as a permanent home. Its cost cannot exceed $5,000 nor can they spend more than $50 per month for rent. They discover that $5,000 will not purchase the kind of home which they desire. They are willing to build their home in units and can make an immediate payment of $1,000.

Their architect recommends a house the first unit of which, with the lot, will not cost over $5,000. To finance this, $1,000 is paid down and the builder accepts a contract calling for monthly payments of $50. Interest at 7 per cent is to be figured semiannually, monthly payments to be credited at the same time. At the end of 4½ years an addition costing $1,600 is to be built, at which time a loan with interest at 6½ per cent is to be secured from a Building and Loan Association. This will be large enough to build the addition and pay off the first mortgage. At the end of 3½ years more the final addition is to be built at a cost of $1,400 and a new loan made.

Details of the various transactions are as follows:

Amount of contract for first unit..... $4,000
Amount credited on contract each 6 months.. 300
Semiannual interest rate, 3½ per cent.

Number of periods required to pay off first mortgage: $\frac{\$300 \text{ (semiannual payment)}}{\$4{,}000 \text{ (amount of loan)}} = .075 =$ amount to amortize each dollar of loan. The chart indicates that 18 semiannual payments represent amount of unpaid loan. $\frac{\$300 \text{ (semiannual payment)}}{\$.13 \text{ (payment at } 3\tfrac{1}{2} \text{ per cent to amortize \$1 in 9 periods)}} = \$2308$, balance due on loan. (*Problem* 4.)

Cost of second unit..... $1,600
Amount to pay first loan..... 2,308

Amount of new loan needed..... $3,908
Cost of first and second units..... $6,600
Possible new loan, 60 per cent of new value $3,960

This loan of $3,960 will bear interest at 6½ per cent, monthly payments still to be $50.

Number of periods N, required to pay second loan: $\frac{\$300 \text{ (semiannual payment)}}{\$3{,}960 \text{ (amount of loan)}} = .075$ amount to amortize each dollar of loan. The chart indicates 17.3 semiannual payments will be required. (*Problem 2.*) At the end of 3½ years the number of payments required to repay loan will be, 17.3 — 7 payments = 10.3 payments. $\frac{\$300 \text{ (semiannual payment)}}{\$.116 \text{ (payment at } 3\tfrac{1}{4} \text{ per cent to amortize \$1 in 10.3 periods)}} = \$2{,}586$ still owing on the contract at the end of 3½ years. (*Problem* 4.)

Cost of third unit..... $1,400
Balance due on second loan..... 2,586

Amount of new loan needed..... $3,986
Total cost of three units..... $8,000
Possible new loan, 60 per cent of total value $4,800
Actual loan made for..... $4,000

At no time the total indebtedness amounted to more than $4,000 nor have monthly payments exceeded $50 or 25 per cent of the monthly income.

# Nationally Planned Publicity—

BY ROGER WADE SHERMAN
Managing Editor, American Architect

ADVERTISING and publicity for architects have long been subjects of avid professional discussion. The columns of this magazine have been open to the valid pros and cons of the subject; and in many a constructive article architects have offered suggestions for promotional programs or have reported the more or less successful activities of local organizations.

Today more than ever before, the architect—collectively and individually—stands in need of an effective program which will inform the public as to his technical abilities, his necessity as a member of the building world and the value of his service in every type of building operation.

Thus far, however, no such comprehensive program has been mapped. Many ideas already published have obvious merit; but a hindrance to their most effective use is the fact that behind them lies no broad plan into which they fit as a necessary, integral part.

As the value of the legal and medical professions have been impressed upon the public consciousness, so might the use of architectural service be made ultimately a legal necessity to the erection of buildings. But this objective cannot be gained automatically. It will take time; and it will cost money. And under no circumstances can it be accomplished without the effort necessary to develop a carefully integrated plan of action.

Upon what basis can such a plan be projected? What specifically might an ensuing program include? How might it best be organized? What organization might sponsor it into being—and how? Finally, what benefits could the architectural profession and the individual architect ultimately expect from the conclusion of a well-conceived campaign of advertising and publicity? These are questions of moment. All cannot be answered here. But the following paragraphs may clarify their scope and indicate some practical approach to a solution of the problem they represent.

## THE BASIS FOR A PLAN

A PREREQUISITE to any practical answer to the first question is organization—notably organization toward a well defined objective. Herein lies one of the gravest difficulties that architects must face—and overcome—before they are regarded by the public as important beyond their present status.

An objective is as vitally necessary to the formation of a publicity campaign as the proper sort of foundation is to any building. Indeed, an objective *is* the foundation of any publicity effort. Not until the desired results are explored and definitely stated can the public's antipathy or active opposition be measured. And without this measurement effective results will be hardly more than happy accidents from even the best-intentioned of advertising or publicity efforts.

In matters of publicity, architects are prone to be like the client, all of them have known, who feels himself supremely competent to design the house himself. His only use for an architect is "to have the blueprints made." Publicity today is a kind of subtle science; and its technique and materials are as foreign to the average architect as is the art of good building to his client. The simple advertising of yesterday has given ground to the Public Relations Program, the extent of which is regulated by the exigencies of the situation as a coat is cut to the conformation of the man.

Thus, before any plan involving the promotion of the architectural profession can be projected the services of a Public Relations Counselor should be retained.

The work of such an individual—or organization—involves two methods of attack. First of all the problems of the profession must be analyzed and means developed by which each individual architect might aid in the discovery of solutions. Concurrently aggressive campaigns should be pushed to mould the public's attitude toward architects into a more favorable form and to eliminate from architectural practice many elements of opposition.

Much requires attention in the latter field of activity. There exists, in the field of public work, infringement by a variety of Governmental agencies upon preserves that architects have rightfully regarded as their own. The growth of organizations that design, construct and finance has cut largely into the architects' volume of industrial and residential work. And the rapid development of the speculative builder has effectively overshadowed the architect as a designer and supervisor of small house construction.

# The Key to Better Business

**A Public Relations Program with national scope is needed by the architectural profession. Essentials of such a program include:**

1. **Organization of all architectural bodies and individuals toward attainment of well-defined objectives.**
2. **Direction of nation-wide publicity and advertising efforts by an able, energetic Public Relations Counselor.**
3. **Sponsorship by a nationally-known organization of a comprehensive plan to impress the public with the value of architectural service in every type of building.**

No architect can overcome these hindrances alone. No local organization can combat them effectively. The consciousness of the general public must be effected before viciousness of any general current practice can be eliminated; and in the case of the architectural profession this applies with telling force. Competitors of architects have "sold themselves" to the public. Architects *must* do likewise. But only through the strength of organization, an unanimity of opinion as to desired results and the professional guidance of an expert Public Relations Counselor can this be accomplished. In combination these three requisites form the basis for a plan of professional promotion.

## PROGRAMS OF ADVERTISING AND PUBLICITY

SUPPOSE that architects had recognized the necessity for a campaign to improve public relations. Suppose they had organized themselves sufficiently to retain the required expert assistance. What, specifically, could be done by a central bureau operating on a national scale to further the stated objectives of the architectural profession?

One of the most telling practices of any public relations program is the national co-ordination of every publicity and advertising effort. All successful campaigns have been directed from a central source, the elements keyed to a characteristic type of presentation and released simultaneously to all sections of the country.

Thus, in an exhibition program for example, the publicity bureau might prepare general details, provide a skeleton selection of material, indicate desired methods of presentation, exploitation and local publicity, and instruct local organization representatives by means of mimeographed information sheets. Planning would be done centrally, execution of the details, locally.

At a stated time—through advertisements and news stories in magazines and newspapers, on billboards and over the radio—announcement would be made, say, of a "National Small House Week." Simultaneously all local exhibitions would open. Business and civic associations would announce their sponsorship of the program. Throughout the exhibition period, news stories, prepared in advance would appear in local papers.

Co-operation of department stores and building material dealers would have been assured long since; and the local interest thus generated would effectively place in the mind of the public the fact that architects are an important factor in the small house building field.

Plans to make "National Small House Week," a yearly event would be announced at the close of the exhibitions. Throughout the following year, advertisements would appear stressing the value of the architect's services in the small house field. Stories in both magazines and newspapers would point out interesting examples of the architect's service to his client. All would emanate from the central publicity bureau; and by the time the next exhibition was held, the public would have a greater interest in the product of the architect's abilities and a greater enlightenment as to the value and availability of his services.

Thus, in substance, have all successful campaigns been executed. Publicity created "The Sweetest Day in the Year" for the candy manufacturers. It made "Mother's Day" a red-letter event for the florists; and "Father's Day" means invariably the purchase of a new necktie to millions of well-mean-



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ing wives. Objectives of these campaigns are different from that under discussion. But the point to be made is that well-directed, properly co-ordinated and continuing publicity can create and hold new markets—for architects as well as others.

Means of accomplishing this are not confined to the example chosen. Effective direct action of a publicity and advertising nature might result from radio talks by prominent local architects, lectures on architectural subjects before clubs and in schools, sponsorship by architectural organizations of civic developments, articles in both magazines and newspapers, merit awards for new buildings, prizes for modernization in local block-improvement competitions. Doubtless there are many other ways by which the public's interest in architecture can be stimulated and information spread as to the worth of the architect's professional activities. All are valuable to some degree. Their greatest effectiveness can be assured only when each becomes an element of co-ordinated effort based upon planned action along a broad front.

## THE INDIRECT ATTACK

ALL of the foregoing suggestions refer to the direct mechanics of a public relations campaign. As such they may be the least valuable work of a Public Relations Counselor. For often the most important objectives cannot be gained by such relatively simple methods. In some instances there may exist policies or deep-seated prejudices that cannot be changed except through indirect attack of the most delicate nature.

Suppose, for example, the policy of some Governmental department excluded private architectural firms from participation in a large building program. It is safe to say that direct action could accomplish relatively little toward changing the policy of the department or the attitude of the officials concerned, for architects are weak numerically and ordinarily not influential. Indeed, pointed demands that the policy be changed might serve only to antagonize the department and thus, by strengthening its opposition, defeat the entire purpose of the architects' objective.

A Public Relations Counselor might advise a different method of attack. Leaving Government officials to their own devices, he might plan a campaign that would involve, perhaps, a series of lectures to women's organizations throughout the country. To them would be presented the possible facts that exclusion of architects from a public building program implies added administration expense in the form of a technical bureaucracy and a dangerous lowering of former high standards of architectural and civic design. The women's part in combating the situation would be a petition to the Government—not to the department involved, but to an officer superior to it.

The result of such a course might conceivably become attainment of the objective. Concerted action by representative organizations implies widespread and strong feeling against an existing situation. It also represents an adverse attitude of a significant political unit. And the combination of the two makes a wall of public opinion, the strength of which many a politician has, before this, tested to his sorrow.

## THE SPONSORING ORGANIZATION

IF such results could be accomplished, through the agency of a Public Relations Program, the costs would be trivial in comparison, whatever the amount. Charges of Public Relations Counselors are based upon the relative complexities of the problem at hand and are usually divided into two parts.

A retainer fee assures a complete study of the problem involving analysis of the objectives and a detailed measurement of the opposition to be encountered. From this a public relations plan is projected, mechanics of which may include paid advertising and various types of publicity depending upon the extent of the program and the type of opposition to be overcome. This plan is usually offered as a means of attaining the desired objective, within a specified number of months. If accepted, the Public Relations Counselor is retained on the basis of a monthly fee, expenses incident to the program being borne by the organization.

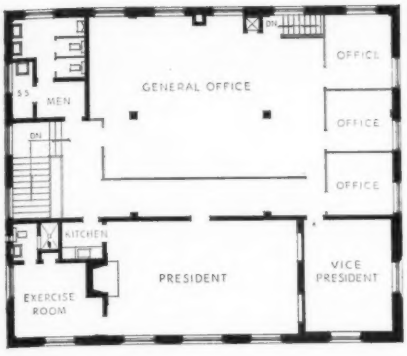
The logical body to employ a Public Relations Counselor on this scale would be one interested generally in the advancement of the architectural profession. This does not necessarily mean the A. I. A., though, with a complete representation among architectural organizations and with adequate financing, a public relations plan might well be carried forward under its auspices. A cultural foundation might also provide the necessary sponsorship.

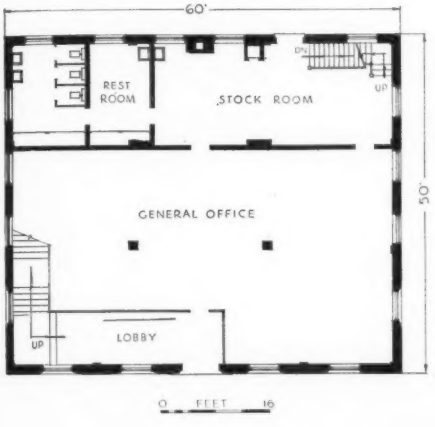
Actual details of organization would necessarily depend upon the type of body sponsoring the effort and the recommendations of a Public Relations Counselor. Certainly there are many architects in various parts of the country who have ability at advertising and publicity. They need only the encouragement of a balanced program and the benefits of technical direction to serve admirably as field assistants to a central bureau. Indeed, in a program of the scope necessary to the architectural profession, the help of these men in spurring local activities would be essential.

## BENEFITS FOR THE INDIVIDUAL

FOR the profession as a whole, an aggressive public relations program would do much toward ultimately removing some of the many handicaps—material and psychological—under which it now labors. The individual architect could expect fully as much benefit. In addition there are particular and personal advantages involved.

To the architect in a small town, for example, a public relations bureau would furnish a prestige and a professional background (*Continued on page* 103)



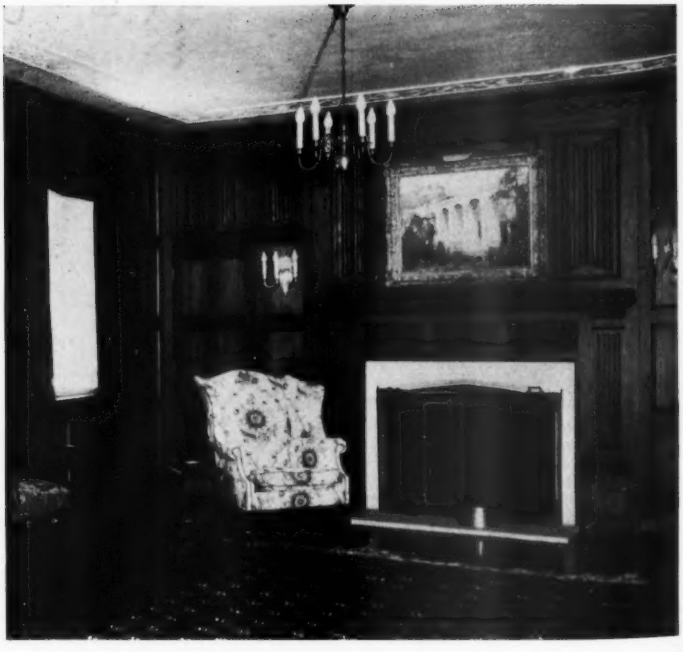




## EDWARD W. TANNER, ARCHITECT

**POSTAL LIFE AND CASUALTY INSURANCE CO. BUILDING**
**KANSAS CITY, MO.**

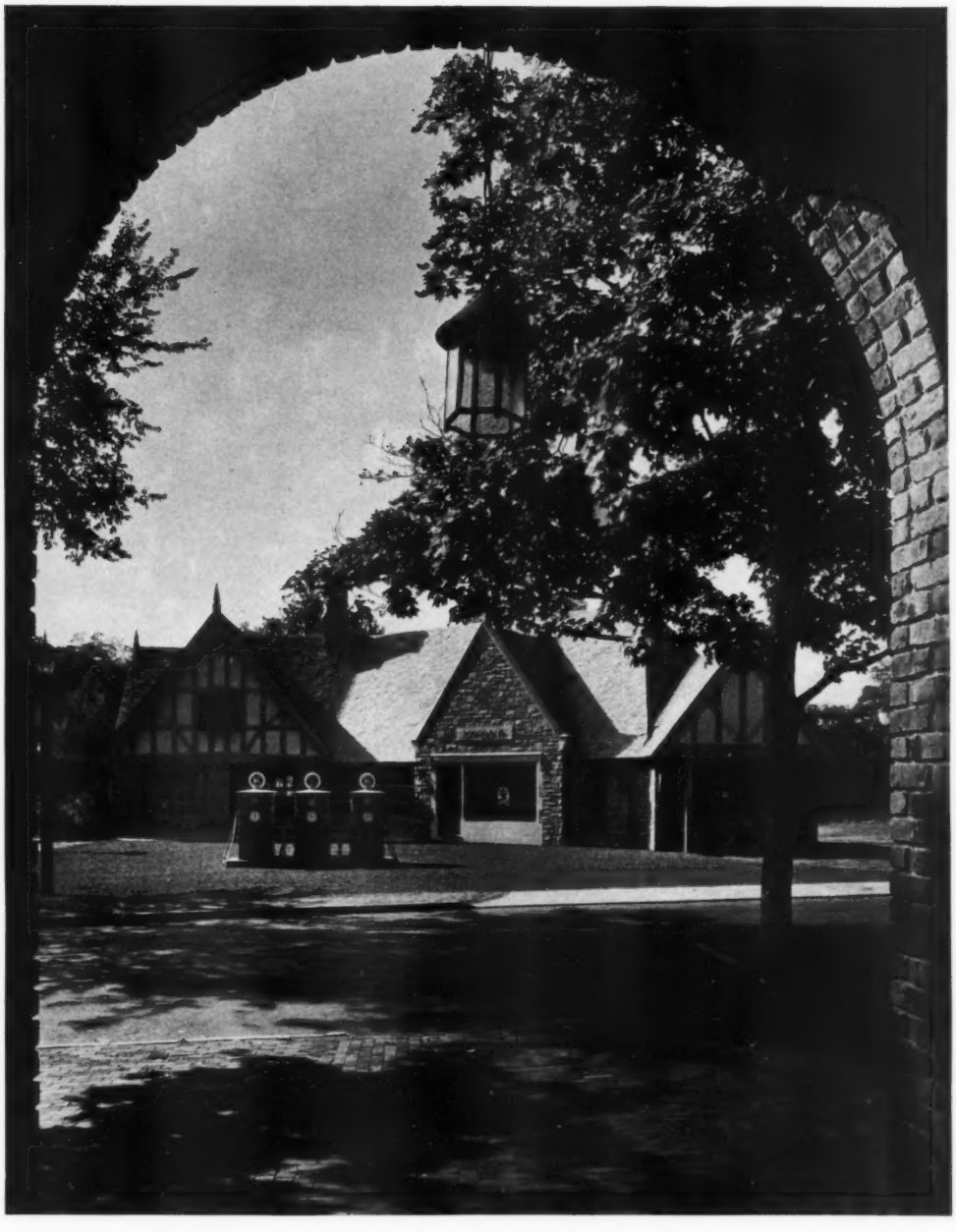
Photographs by Tyner and Murphy

Exterior: reinforced concrete faced in dressed buff Indiana limestone, statuary grade. Spandrels: lead-clad copper, painted color of weathered copper



Above: office of vice president. Paneled in walnut veneer. Right: office of the president. Paneling, matched walnut. All ceilings acoustically treated

**POSTAL LIFE AND CASUALTY INSURANCE CO. BUILDING . . . KANSAS CITY, MISSOURI**
**EDWARD W. TANNER, ARCHITECT**



## W. STANWOOD PHILLIPS, ARCHITECT

### SINCLAIR SERVICE STATION

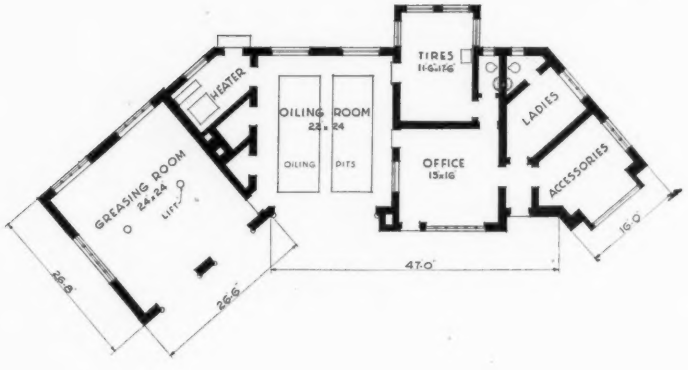
### SCARSDALE, NEW YORK

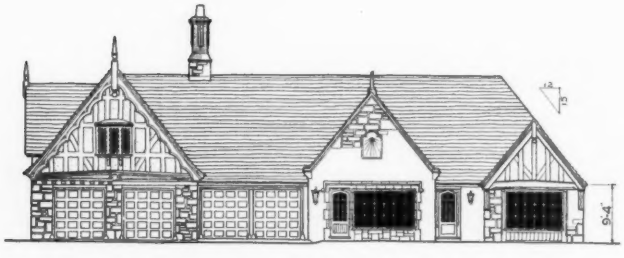
Photographs by Harold Halliday Costain

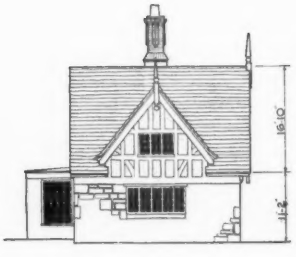
**W. STANWOOD PHILLIPS, ARCHITECT**

## SCARSDALE, NEW YORK
## SINCLAIR SERVICE STATION

Located in the center of a well-restricted residential community. Design and materials typify architectural character of the neighborhood. Right: Ladies rest room. Elevations below have been developed to show true proportions



# PAUL PHILIPPE CRET, ARCHITECT

## CENTRAL HEATING PLANT, WASHINGTON, D. C.

Photographs by William M. Ritasse

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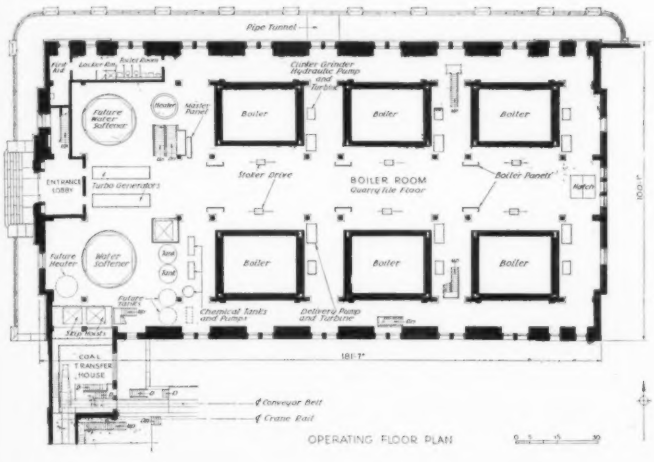
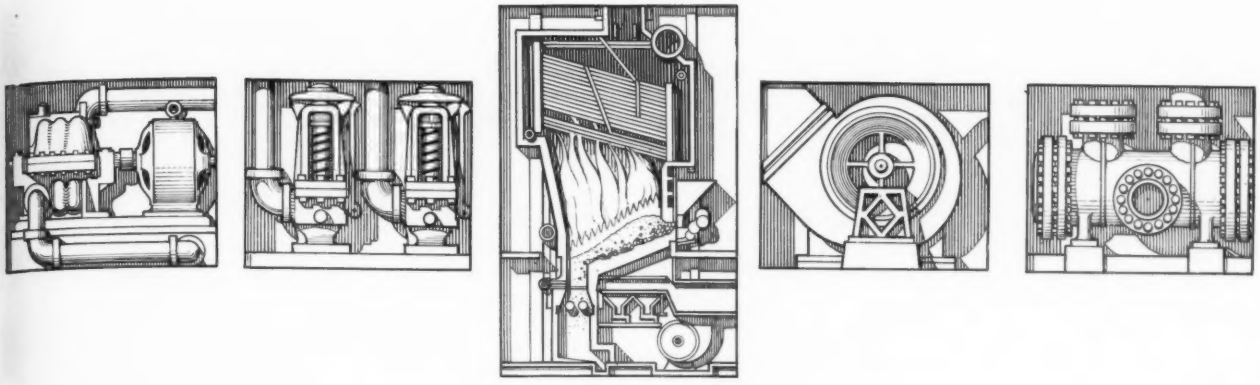


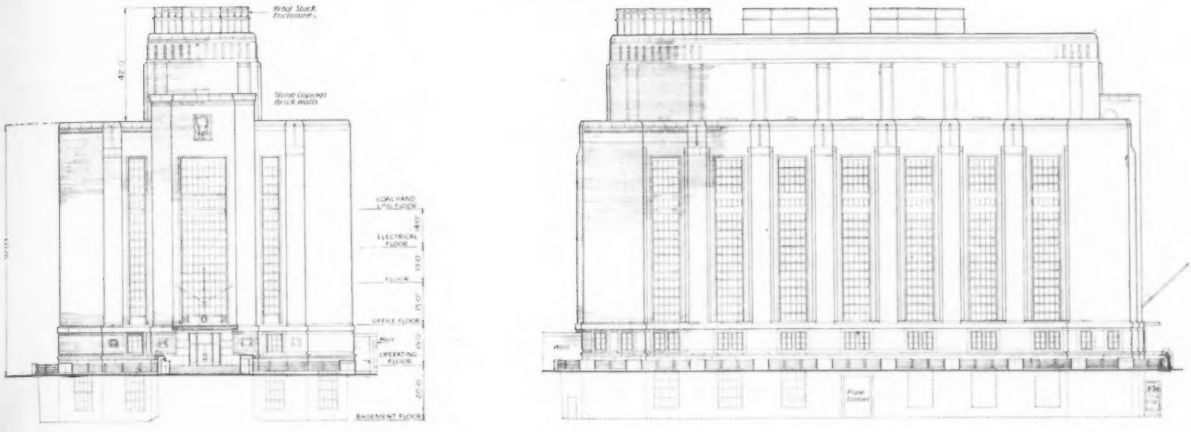

OPERATING FLOOR PLAN

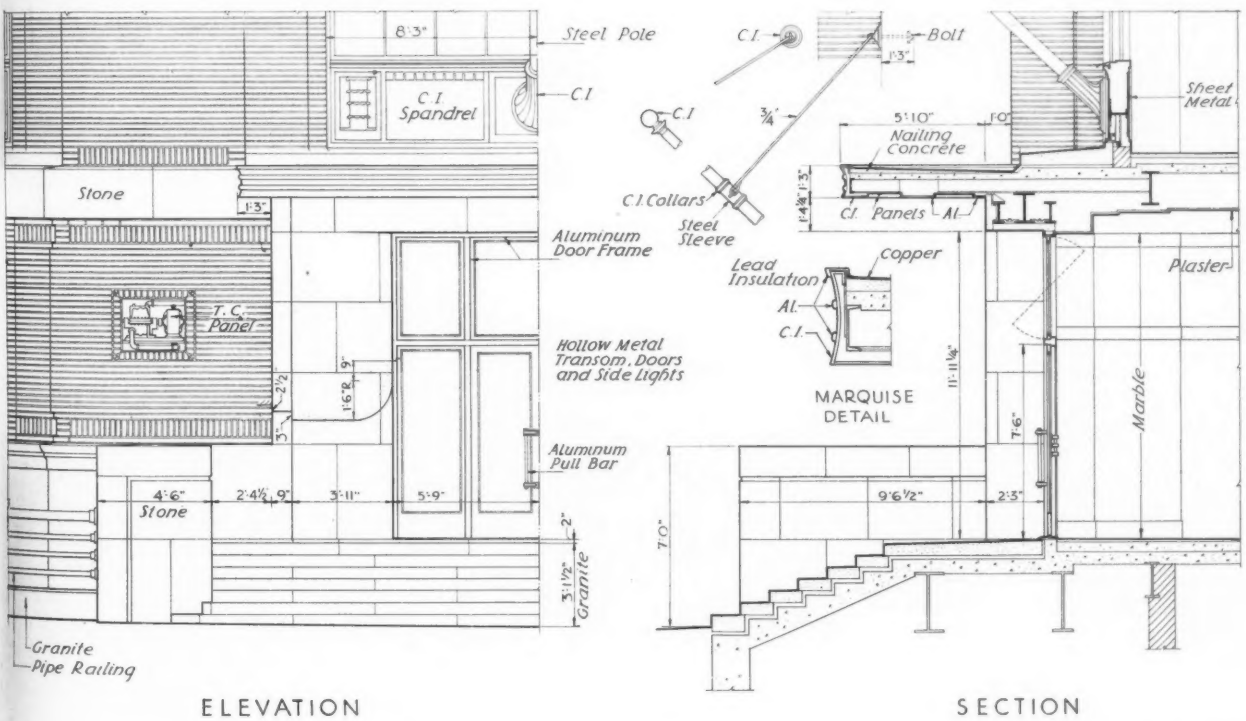
Exterior: smooth textured, grayish-buff brick, trimmed with light buff Indiana Limestone, sand rubbed finish. Panels on entrance façade (see details on facing page) are in terra cotta relief. Small panels are in two colors; large panel in six

**CENTRAL HEATING PLANT**
**WASHINGTON, D. C.**

**PAUL PHILIPPE CRET, ARCHITECT**








ELEVATION

SECTION

MAIN ENTRANCE DETAILS, CENTRAL HEATING PLANT, WASHINGTON, D. C., PAUL PHILIPPE CRET, ARCHITECT

# As It Looks

## PWA HOUSING DIVISION PLANS

PRODUCTION of low rentals in any housing project is not always under complete control of the architect. In times past the objective of low rents for high types of dwellings has been missed partly because of high land costs and partly also because of excessive financing charges. The architect's contribution to low-rent housing lies in his ability to design adequate, economically planned and properly constructed buildings. If he sees to it that costs are kept to the minimum consistent with good workmanship, he need have no other concern. If other factors are equally as economical, low rents will be possible.

PWA Housing Division plans published elsewhere as an exclusive feature of this issue have been projected from this point of view. Though they have been developed only as suggestions by which architects will be better able to solve local housing problems every factor of economy has been considered. Compact planning, efficient layout of equipment, simplicity of structural schemes—all elements have been well co-ordinated to produce plans that could serve as standards for any type of low-rent housing project.

## WANTED: A BETTER ARGUMENT

THE Treasury Department Supervising Architect's office in the past has argued strongly against the employment of outside architectural talent. One of its arguments has been that post offices are complex problems of a highly specialized nature, which require the services of a specialized organization. Nothing could be further from the truth as every architect knows. As a matter of fact, there are few buildings more simple to plan. They cannot compare in complexity with any number of other types of buildings that architects are constantly called upon to study and design. Even the "Look-out" gallery is no great problem. And the few special standards naturally inherent to a post office can be quickly described and illustrated. Complexity of the problem is not a good argument for retaining a large staff in Washington to do nothing else. There must be better arguments or none at all.

## GOOD PUBLICITY FOR ARCHITECTS

FROM time to time building material producers have given the public good advice either in their advertising or radio broadcasts. Among these may be mentioned Johns-Manville and the American Rolling Mills. The General Electric Company has recently inaugurated an American Home radio program. It is broadcast over the NBC national network at 12:15 E.S.T. on Sundays. The first program made frequent mention of the architect. In Texas the Texas Retail Lumber Association sponsors a weekly radio program. Emphasis is placed on the desirability of home builders engaging an architect to help plan and advise them on their building problems. All these efforts are commendable and deserve appreciation of the entire architectural profession.

## LET REGISTRATION LAWS GROW TEETH

ARCHITECTS in Texas, one of the twelve states without a law that regulates in some way the practice of architecture, have drafted a statute which they hope will soon be accepted by the legislature. It proposes, in effect, to merely regulate the use of the title "architect" in an effort to eliminate misrepresentation. Although as drafted the law provides penalties for proved incompetence in architectural practice, apparently it allows anyone at all to design buildings of any type or size, provided that he does not label himself an architect. Such a law seems useless as a means of protecting either the public or the profession, for it is too easy a regulation for unqualified individuals to circumvent through technicalities. If registration laws are worth having at all they should contain enough teeth to prevent obvious, though technically legal, malpractice.

## A COSTLY LESSON

SEVERAL years ago a man and his wife built a house. They engaged an architect who was well recommended to them. After an association of seven weeks they paid his bill and turned the job over to a contractor. Asked why, the lady said, "Well, we soon saw that this architect could not be made to understand that we wanted a well-designed, modest home. Had we proceeded with him, we would have been involved in a house beyond our means. The contractor understood and gave us a house we could afford to build." Instances like this are costly not only to the architect and client, but to the profession as a whole. One case of this kind can undo all the credit accruing to the profession by a dozen satisfactory jobs. It is a duty of the architect to give a client what he can afford. If this is not consistent with what the client demands he should be so informed.

# s to the Editor

## THE HIGH COST OF SLUMS

MAJOR BARNES of the London Town Council, Town Planning & Housing Committee has said, "There never has been money in housing the poorest people well. There has always been money in housing them ill." No doubt this partially, at least, accounts for the existence of many slum areas in the United States. Unlike the British Government, we have not viewed the slums as a menace. There has been hesitancy in proposing Government subsidies as an answer to the problem. We are but just beginning to understand that Government has subsidized slums for years. It is said that it costs a city ten times the tax derived to service the territories occupied by the slums. This is a costly subsidy by itself not readily apparent in the bookkeeping.

## ARCHITECTURAL GHOSTS

A PERSON who writes a speech or article for publication to be presented over the name of another person is known as a ghost writer. In states having laws requiring that plans filed with building departments shall be signed by a registered architect, there has developed a variation of the ghost writer. This person might well be termed an "architectural ghost." These ghosts, for a small consideration, place their name and stamp on drawings prepared by others in order to allow the plans to conform with the state law. The ghost writer is not dishonest. He has done no one any real harm. The architectural ghost is dishonest and public safety may be involved. It is a practice that should be stopped. If state laws are enforceable, they should be enforced. If not, they should be made so.

## ENCOURAGING SIGNS

THE profession is, apparently, at last alive to the great need which exists for its assuming an active interest in the design of small houses. In recent months the Editors of AMERICAN ARCHITECT have received several requests from A.I.A. chapters and architects' societies for information or advice on publicity campaigns intended to bring the profession in closer contact with the builders of small houses. It has been proposed by the New York Chapter that a competition be held for the design of houses costing under $5,000. The matter is now under consideration. These are encouraging signs. They show that the profession as a whole is rapidly becoming alive to a situation which it too long neglected from both a service and business standpoint.

## EDUCATION CAN ACCOMPLISH MUCH

C. F. PALMER, a building owner and operator of Atlanta, says that Mussolini, interested in better housing for the poor in Italy, found the people loath to leave the congested areas to which they were accustomed. He is solving that problem by sending the children from these areas to a summer school. There they live under pleasant, healthful surroundings and are taught higher living standards. They go back home dissatisfied with the homes of their parents and ultimately the families seek the new and better houses. Mussolini not only has a keen understanding of human nature, but knows as well the value of education in correcting the slum problem in our cities.

## WORTH READING AGAIN

FRANCIS LORNE, F.R.I.B.A., is a member of the English architectural firm of Sir John Burnet, Tait and Lorne. For the January issue of AMERICAN ARCHITECT, Mr. Lorne wrote one of the most constructive comments on present-day architectural problems that has ever been published. He wrote from the English point of view. But in doing so he could not have stated the American case more forcefully. The article, entitled "Contemporary Problems of the Architectural World," is worth studying. We urge you to read it carefully again.

## IT STANDS THE TEST

MANY architects each year design and send to their friends Christmas and New Year cards of distinction. A 1935 New Year greeting designed by Harry F. Cunningham, carries his message in verse. It ends,

> "Let us all be Artists—every one;
> Remembering, when all's said and done,
> That an Artist is really, simply *he*
> *Who makes things better than they need to be.*"

The last line stands every test which can be applied. The plainest drinking glass serves the purpose. An artist makes it better than it needs to be. A cart with an engine will give one transportation. The artist makes a beautiful automobile out of it. Without question it is the artist "who makes things better than they need to be."

THE BRIDGE IN ESPALION

# Two Ancient Bridges of France

BY SAMUEL V. CHAMBERLAIN

Illustrated with Drypoints by the Author

THE example of the Romans, who left France with that matchless lesson in bridge building, the Pont du Gard, has been followed by the French down through the centuries. This land of many rivers is filled with noble, solidly built, old bridges, which live to tell the tale of distant days, while other monuments of the time crumble and disappear. Two of the most noteworthy examples of medieval bridge building are the venerable and picturesque relics still standing in Espalion and Albi. They are among the most ancient in France, and the most colorful.

The bridge in Espalion has outlived all the rest of the town, and is now a tattered and neglected old veteran. Yet it has plenty stamina left to withstand the tempestuous outbursts of the river Lot. Its early history is lost in a mist of uncertainty. Some historians date it from the Eleventh Century, and it is quite conservative to state that 800 years of hard service and traffic squabbles are behind it.

The bridge is striking, first of all, on account of its color, which is a glorious reddish brown. The patina which several centuries of rain and sunshine can leave on cut red sandstone is indescribable. No inkling of its splendor can be conveyed in the black and white of a drypoint. Gaze into a crystal goblet of old, old Château Margaux and you have found a color which approaches it, however.

Its proportions are quite as subtle as its color. The arches are delicately pointed, just missing the semi-circle. The silhouette is graceful and harmonious. It is obvious that the strength of the bridge depends upon well calculated stone structure, and not upon mere mass. It is a small bridge, about 180 feet in length. For those interested in highway engineering, the slope up to the summit and down again is close to 10 per cent.

Utter tranquillity has been accorded the bridge in

its old age. Only an occasional donkey cart jogs over its cobbles now, for a crass new bridge on the national highway has cornered all the traffic. The village laundry is still spanked within echoing distance of the ancient red stone arches, and a dozing fisherman is usually leaning idly over its parapets. The ivy-covered ruin of a chateau is a near neighbor. Steep roofed old houses with overhanging porches bulge over the riverbank, and from their tattered balconies come reverberations of family quarrels, of badly tuned mandolins and sputtering radios. On second thought, it is not such utter tranquillity after all.

The famed bridge at Albi dates from the Eleventh Century also. Originally a heavily buttressed stone bridge, it has undergone many transformations in its long lifetime, and has been shorn of many of its picturesque elements. Imagine its silhouette in the Middle Ages when a Chapel tower rose on the central pier and a feudal entrance tower fortified each end! At one time a cluster of houses was built on each pier also. A comparatively restrained picture greets the traveller today.

The bridge crosses the turbulent river Tarn, whose overwhelming floods make history every few decades, the last occasion being very recent. The aged bridge has stood its ground staunchly, but the floods have ripped off the entrance towers, the chapel and the old houses, and often have damaged the arches of the bridge itself. More than a century ago its narrowness proved a serious handicap to two-way stagecoach traffic. As a result, the bridge was widened by facing the downstream side with an arched wall of brick, and by springing a series of flat brick arches between the buttresses of the upstream side. And thus it stands today, a highly colorful and poetic blend of old stone and brick. It is still inadequate for this hurried day of motor traffic. Two immense brick bridges now over shadow it—in size. Needless to say, they do not approach it in beauty, nor in its setting. For the glorious jumble of old Albi houses, the towers and turrets of the Bishop's Palace and the amazing brick hulk of the cathedral provide a tapestried backdrop entirely in keeping with the aged splendor of the bridge itself.

ALBI SUNSET

BLUM PHOTOS

ACME

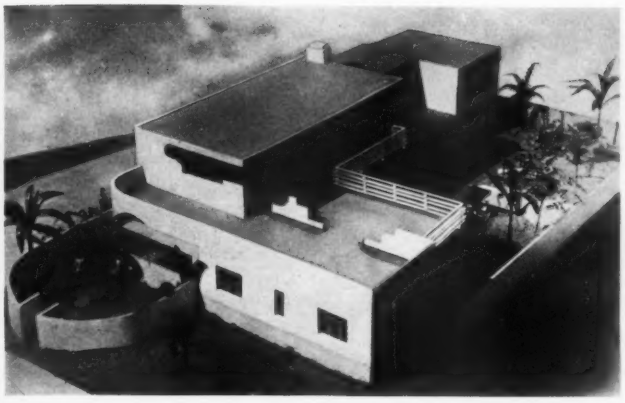
Above: Secretary of the Interior Harold L. Ickes shows Miss Ellen Wilkinson of England a model of low-rent housing developed from unit plans prepared by PWA Housing Division, directed by Colonel Horatio B. Hackett, left above. Assisting Col. Hackett are, upper center, Alfred Fellheimer, PWA Housing Consultant from New York, A. R. Clas, Assistant Director of the Housing Division, lower left, and Ernest A. Grunsfeld, Jr., of Chicago, Housing Consultant

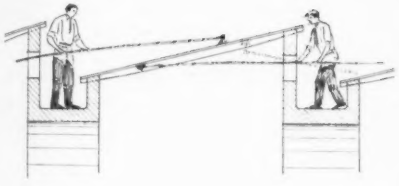
# Trends and Topics

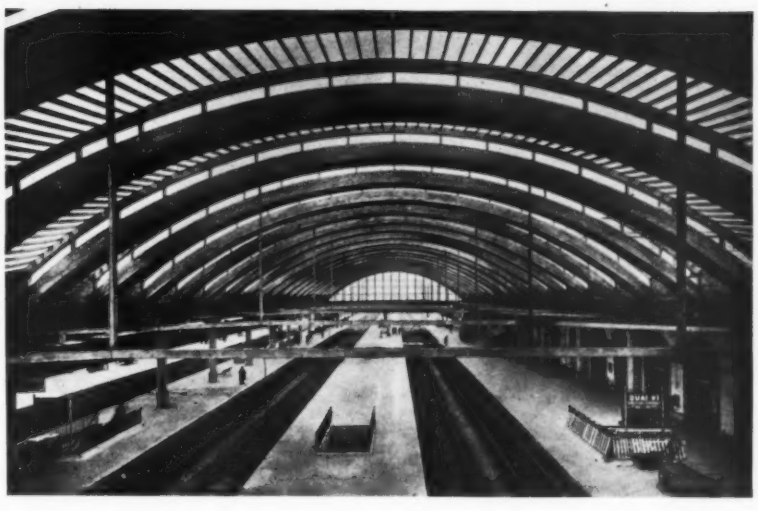
• The Tennessee Valley Authority is the latest Government agency to enter the plan business. For 50 cents it will send anyone a perspective, plans and elevations of houses built at Norris. Though the order blank, furnished those interested, carries a line, "It is recommended that a competent architect be consulted if these plans are to be used as a basis for construction of houses," it is a foregone conclusion that some people will use them as a basis for construction without employing an architect. The houses are small, ranging from three to six rooms. They are well designed. One has little complaint on that score. But the Government is, in effect, establishing in the mind of the public a ridiculous value for even sketch plans of small houses. No architect can compete with the Government on the basis of 50-cent plans. And the public is not yet fully aware of the fact that it gets what it pays for. The Tennessee Valley Authority would do well to withdraw its offer. If it wants to distribute free plans which the people have already paid for, that is another matter. If it does that, it should emphatically state that the sketches are ideas only and that construction should be undertaken only with the aid of an expert in building.

• Purpose of the Federal Housing Administration as stated by J. Howard Ardrey, Deputy Administrator: "It proposes to foster the improvement of existing real property and it proposes to make urban residential property easier to buy and safer to finance forevermore."

• To broaden the field of residential building to which provisions of NHA Tiles II and III can apply, J. Howard Audrey of the FHA has announced that





Above: model of exhibition house to be built in Miami Beach, Fla. Robert Law Weed, architect. Above, right: a huge turntable upon which cars revolve about a center service station is a new time and space-saving device. Right: concrete rib troughs facilitate cleaning of roof windows in the new train shed at Reims, France

# of the Times . . . .

operative builders are included in the FHA New Construction Program. As opposed to the owner-builder, operative builders normally construct about 80 per cent of the small houses in this country, according to Mr. Audrey's announcement. Their activity is said to have been the biggest factor in the construction of homes. It must be started again, officials say, if house construction is to resume its normal value.

• Obsolescence and consequent demolition of city skyscrapers within fifty or seventy-five years is forecast by William Orr Ludlow. Trends in decentralization, transportation, methods of business and development of new equipment and building materials, ideas of architectural design and the rapid changes in neighborhood characteristics are some of the reasons for Mr. Ludlow's prophecy.

• From Ralph Walker recently came a suggestion that the New York Chapter of the A.I.A. conduct a local competition for houses to be built for under $5,000. He stressed the necessity for accurate cost estimates and need for improvement in the design of such small houses. The suggestion is a good one for all A.I.A. Chapters to follow.

• More than a billion dollars is lost each year from the damage caused by the rusting of corrodible materials used in buildings, according to a survey made by the Copper and Brass Research Association.

• "Through a program of educational work . . . you will ultimately change the entire cultural life of the people."—Arthur D. Whiteside, Member, NIRA, to members of the Construction Industry in a speech at Knoxville, Tenn.

ACME

**BILLION DOLLAR BUILDINGS** Results of the Federal building program in Washington, D. C. as seen from the air. Above, a general view showing how streets radiate from the Capitol in the center. From left to right are the House Office Building, the Library of Congress, the Folger Library, the Supreme Court Building and the Senate Office Building. Right, the famous billion dollar "triangle group." It includes the Department of Commerce, Post Office Department and Interstate Commerce Buildings, the Department of Justice Building and the Archives. In center foreground is the National Museum

• Houses built almost entirely of welded steel were forecast to the International Acetylene Association by G. O. Carter, consulting engineer. He said, "The house of the future will be constructed of steel in all its vital points. Its frame and flooring will be of steel and, judging by recent examples in modern office buildings, even in its walls and furnishings steel will replace wood. Certainly welded fabrication will be the standard method of construction."

• Loans for modernization and repair purposes are being reported at the rate of a million-and-a-half dollars a week, according to an announcement of FHA. Estimates of the dollar value of modernization activity directly traceable to FHA's Better Housing Program reached more than $213,834,000.

• Secretary of Commerce Daniel C. Roper regards the Department of Commerce as the weather Bureau of the business world. His forecast for 1935: "Clearing, with fairer weather ahead."

• The famous "Leaning Tower" of Pisa is assuming a greater inclination each year. Recently work was begun to consolidate the foundations by pumping the seeping water out and forcing concrete in under high pressure. In 1174 Bonanno, the original architect, stopped building (*Continued on page* 105)

# New Neighborhoods

**An important new field for architects—the improvement of real estate subdivisions—is opened through determination of FHA not to insure mortgages on houses built in economically unsound areas**

IN connection with the administration of Title II of the National Housing Act the way is open for architects to sell their services to 10 million families who will absorb 10 million vacant subdivision lots involving the building of 30 billion dollars worth of homes.

These figures are derived from a lecture "New Neighborhoods" given by Jacob Crane of the Federal Housing Administration. In discussing the future of vacant subdivisions and FHA's attitude towards applications for mortgage insurance for properties in such subdivisions he clearly indicated the important part that architects can take in handling impending reorganization of this field.

The salient point for architects rests in Mr. Crane's statement that mortgage insurance will not be granted for houses built in vacant subdivisions unless such subdivisions conform to certain standards and can be considered eligible risks. The prospective lot purchaser will, therefore, be certain of being able to borrow money only if he secures dependable professional advice before he buys. The architect should be his logical choice as adviser.

The determination of FHA to review in the Washington office applications for development of vacant or nearly vacant subdivisions has been brought about by a number of important considerations. The total of lots lying in such subdivisions is enormous. There is every indication that a great many applications will come in for mortgage insurance for houses on such lots. But, since there is a great difference in the basic soundness of these subdivisions, it is essential to determine in which of them the residential properties, as they are built, will be relatively stable in value and in marketability.

The only design of many subdivisions has consisted of the driving of stakes at intervals and the preparation of a required plat for record. In such properties there is no intelligent layout of streets with appropriate widths, no minimizing of intersections dangerous to pedestrians, no provision for park or playground, no safeguard against encroachment of undesirable commercial buildings or racial groups. Perhaps there is not even a means of access to schools, stores, or station such as would be appropriate and necessary to the type of person who presumably would build there.

Obviously, mortgages on homes in such properties cannot be insured by FHA. The architect should therefore, counsel against purchase of such property and recommend a location where the opposite of these conditions prevails. By doing so he will be serving his client and his community and putting himself in a position further to serve the client when the money borrowed for building is forthcoming.

The insurance of mortgages under the National Housing Act will favor sound, well designed and well located subdivisions; the others are in effect relegated to continued stagnation. In these latter cases, it will be necessary to overcome the handicaps by reorganizing sub-standard properties with more intelligent regard for the principles of large scale planning. The normal economic development of cities will be advanced by bringing such property to good use, and in no other way can the subdividers and purchasers of lots come out whole.

As Mr. Crane points out, there will be some cases in which the defects are so inherent and of such serious nature that the only wise course is to abandon the project altogether. The following defects, for instance, cannot be remedied: an impossibly remote geographical location; uncontrollable risk of intrusion by inappropriate elements; total lack of prospect for employment; no feasible means of making the property accessible by highway; topography of site too steep to use; schools and shopping facilities unavailable; too severe competition by virtue of excessive subdividing in that territory. These are typical "incurable" defects.

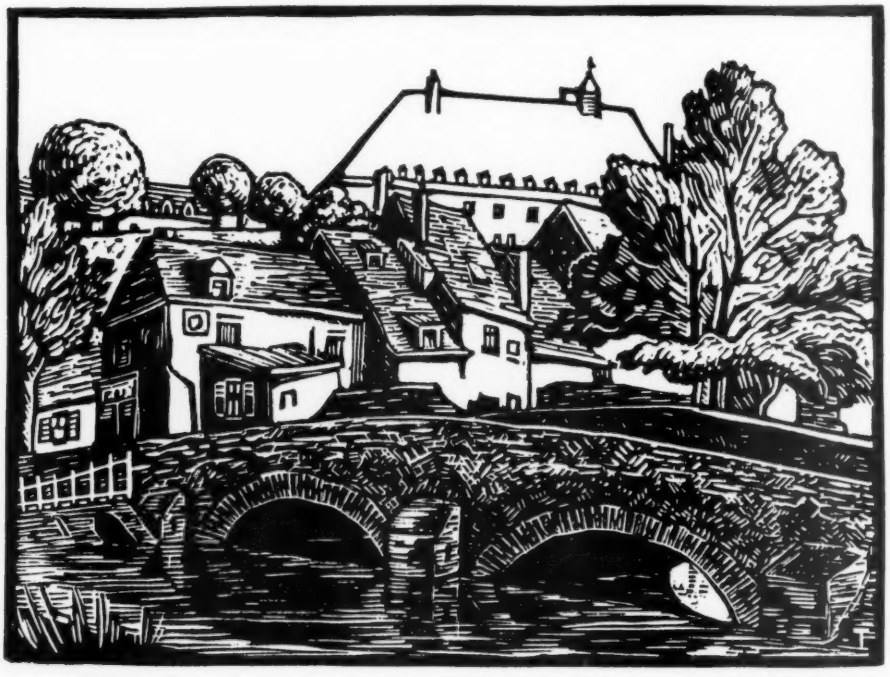
In subdivisions not so hopelessly handicapped, reorganization may be accomplished in a variety of ways. These, though by no means simple, often make possible the correction of the most serious

handicaps. The subdivision, for example, may be re-designed to remedy defects insofar as they are inherent in the subdivision layout; the "water" may be squeezed out of lot prices; resale may be directed toward early use for building rather than for speculation; zoning, private restrictions and building lines can be introduced to protect against unsuitable elements. In accordance with city and regional plans, wide rights-of-way can be established for main traffic routes in order to set buildings back and protect them against traffic nuisances. Parks and playgrounds can be at least be reserved.

In addition to changes in the actual layout of a subdivision there are certain steps which may have to be taken before effective reorganization can be carried out. Equity and contract holders may have to be bought out and the liquidated subdivision redesigned and promoted anew on a sound basis. Voluntary pooling and re-plotting may be initiated, either by a public agency or by the owners themselves. Compulsory pooling and re-plotting might be instituted under new legislation; or statutory power might be granted under which a majority of, say, 75 per cent of the owners could require the minority "hold-outs" to come into line. As Mr. Crane suggests, the huge total of lots involved thoroughly justifies public agencies and interested private individuals in seeking every possible means of solving the problem.

Several examples of subdivisions successfully reorganized already exist in this country; and in Europe there are many. In San Francisco, the city engineer succeeded in putting through a voluntary pooling and re-plotting program for a badly designed area. In Chicago one company is liquidating defunct subdivisions and re-designing them. In Europe municipalities have statutory power to compel pooling and re-plotting, although in actual practice compulsion has rarely been found necessary.

While Mr. Crane leads no one to believe that this reorganization and construction will be carried out immediately, there are indications that it has already begun and that it will probably continue at an accelerated pace under the stimulus of the Government's policies. Its importance to architects is so apparent as to need no emphasis. The facts are sufficient. About 30 billion dollars worth of small houses will be built in subdivisions by persons of limited means and slight knowledge of how to proceed intelligently and safely. The special knowledge of architects will be their best guide, both in buying their lots and in building their houses. The majority of subdivisions, having been rejected because of bad original planning, will need to be re-planned. The architect again emerges as the logical consultant. Owners of these properties having got into trouble through attempting to dispense with an architect's services the first time, will doubtless have a considerably more enlightened appreciation of his value to them.



CHARTRES, FRANCE — HARRY LEROY TASKEY

# The Legal Side of Architecture

BY CLINTON H. BLAKE

Blake and Voorhees, Counselors-at-Law

STATE COLLEGE OF AGRICULTURE AND APPLIED SCIENCE · KANSAS · LIBRARY FEB 18 1935 MANHATTAN

## More About State Registration Laws for Architects

A READER of AMERICAN ARCHITECT has directed my attention to a recent decision of the California court (People v. Steiger, California Superior Court, San Francisco County, August, 1934). This is directly in line with the discussion on these pages of architects' registration requirements and the furnishing of plans or architectural services by persons who have not been registered. The California case turns, of course, upon the special California statute. But is of interest as evidencing again the tendency of courts to uphold any reasonable registration law. Also, it indicates the risk which is involved in performing any services of an architectural character without first having complied with legal requirements.

There must necessarily always be a borderline in cases of this kind between architectural services and services which can not properly be defined as such. But many legal decisions make it quite clear that the only safe policy is to give the statute the benefit of the doubt and comply with registration requirements where there is any possibility that services performed may be held to be architectural in character.

The California statute provided, among other things, that: "It shall be unlawful . . . for any person to practice architecture in this State without a certificate, as herein provided or to advertise or put out any sign or card or other device which might indicate to the public that he is an architect or that he is qualified to engage in the practice of architecture."

The statute further provided that: "The word architect as used in this Act means a person who holds a certificate to practice architecture in the State of California, under authority of this Act."

In a prosecution in behalf of the State of California against the defendant, it appeared that the latter had put out a sign with his name and the words "Designer and Builder." The State contended that the displaying of this sign was a violation of the statute. The defendant contended that the sign could not mislead anyone within the meaning of the law.

The Court considered also the question to which I have already referred in other articles, namely, the ability of the legislature to require the procuring of a certificate in the interest of public safety and various exceptions in the California statute with respect to the prohibition against an unregistered architect putting out a sign indicating that he is an architect. The exceptions in the law were directed generally to allowing an unlicensed person to prepare plans for work and materials to be furnished by him directly or indirectly for certain specified alterations and similar work and to granting permission for an unlicensed person to prepare plans, if before undertaking the work, he advised the person ordering them that he was not an architect.

### A "DESIGNER AND BUILDER" IS AN ARCHITECT

THE decision of the Court was as follows:—

"Appellant was accused of advertising by displaying a sign indicating that he was an architect or qualified to engage in the practice of architecture without first having obtained a certificate from the State Board of Architectural Examiners so to do, thereby violating Sec. 5, Chap. 983 of the Statutes of 1933. The sign in question contained the name of the appellant and the words 'Designer and Builder.' Sec. 5 of the Act provides in part as follows: 'to advertise or put out any sign' . . . which might indicate to the public that he is an architect or that he is qualified to engage in the practice of architecture.'

"It will be noticed that this statute uses the words 'might indicate,' meaning that if there is a reasonable possibility that the public could accept the sign as indicative of architectural qualification, a violation of the statute has occurred. The word 'Designer' coupled with the word 'Builder' indicates that the advertiser is a builder and a designer of buildings. Used in that sense the word designer is somewhat synonymous with the word architect, and hence might reasonably be understood by the public as indicating that the advertiser is qualified to engage in the practice of architecture.

"Appellant contends that this advertisement could only mislead temporarily. It is clear, however, that the legislature intended from the language used that such advertisements should not mislead at all.

"Architecture is defined in the New Standard Dictionary as the science of designing and constructing buildings with reference to adaptation to their ends and to beauty of form and proportion. One who holds himself out to the public as a designer and builder is offering his services to design and make plans and drawings for the construction of

buildings; and in the interest of public safety, he may properly be required to procure a certificate evidencing his qualifications for the employment which, by means of his sign or advertisement, he is soliciting.

"The advertisement does not come within the many exceptions set forth in Sec. 5. It is possible that an unlicensed person may 'furnish plans, drawings, specifications, instruments of service or other data for labor and materials to be furnished by such person, either alone or with sub-contractors, for store fronts, interior alterations or additions, fixtures, cabinet work, furniture, or other appliances of equipment,' etc.; but there is nothing in the advertisement that limits this advertiser to such work."

The foregoing California statute is obviously not directed against advertising by an architect as such, however unethical that might be held by the profession itself. It is directed merely against the architect's holding himself out by advertisements or otherwise as qualified to practice architecture, unless he has qualified to do so under the California architects' registration law. This is directly in line with the statutes and decisions in other jurisdictions recognizing the public function which an architect performs and the fact that the public safety and interest is involved in the work which he does. The doctrine that the practice of architecture affects the public to such an extent that it is properly subject to regulation has now become generally recognized and firmly established. It is proper that this should be so, because the public safety and health may well depend on the proper design and supervision of construction of a dwelling or public building.

## KNOWLEDGE OF REGISTRATION LAWS ESSENTIAL

IT is important, however, that architects generally should recognize the extent to which this doctrine has been adopted in recent years. In a great many of the states now an architect must be in effect admitted to practice, just as an attorney or physician must be admitted to practice. To some extent the architect's problem in this regard is a somewhat more difficult one than that of the lawyer or the physician. The practices of the latter are usually confined far more to one locality than is the practice of an architect. Any well-known architect today in one of our larger cities is constantly called upon (except as the present depression may temporarily prevent) to perform architectural services in other widely separated states and localities. He can not safely undertake these services without acquainting himself with the requirements for architectural practice in the other states and making sure that, by performing architectural services therein, he is not, for want of local registration or otherwise, transgressing some statutory requirement.

It would be quite impossible for me here adequately to discuss this phase of the problem, involving as it does a great number of varying state statutes and requirements. Under some of the statutes an architect from another state might not be able to perform any services without securing registration. Others may be worded in such a way that mere supervision of the work, provided the plans are prepared in the state where the architect is registered, will be allowed. Usually, if not in every case, the problem may be solved by the architect associating a local architect with him and having the services in another state performed by such local architect who, of course, would have to be duly registered under its laws.

## REGISTRATION IDEA IS SPREADING

THE registration laws in the various states are about as diverse as the state divorce laws. What can legally be done in one state can not be done at all in another state. What amounts to registration in one state will not comply at all with the requirements elsewhere. Eternal vigilance in this connection, therefore, is the price of safety. Fortunately, it is not a very difficult matter for an architect to acquaint himself with the legal requirements of any state in which he may be called upon to perform services. The essential thing is that he shall acquaint himself with these requirements and not risk difficulties and perhaps serious consequences by going ahead blindly on any job where his status may not be clear.

The movement to require that architectural services be performed only by registered architects is not confined to the state governments alone. It is spreading to municipalities as well, in the form of an agitation for city ordinances requiring the employment of registered architects on buildings within the city limits. Where the law of the state in which a city is located has adequate registration requirements, there is no need of any local ordinance. Where there are no state requirements or where the state requirements are inadequate properly to protect the public with respect to city construction, the only remedy may be the adoption of a local ordinance.

While in some cases there may be a question as to the legality of such ordinances, I believe that, if properly drawn, they would be sustained as proper on the same grounds as those upon which the state laws have been sustained, namely, the protection of the public health and safety. If many cities were to adopt requirements of this kind, confusion might well result and a situation unreasonably burdensome to an architect of extensive practice be created. The more clearly the state statutes are drawn and the more adequate their provisions, the less danger will there be of the adoption of local ordinances. The influence of the American Institute of Architects and similar architectural bodies may profitably be directed to the securing of state registration laws as nearly uniform as possible and of a scope which will discourage and make unnecessary the adoption of local ordinances.

# ROOFING MATERIALS

HOW to designate incline of roof slopes correctly

WHAT roofing materials are suitable for different roof inclines

STANDARD sizes and weights of principal roofing materials

KINDS of hips, valleys, and ridges suitable for various unit roofings

EXPANSION of metal roofings of various types and how to provide for it

DIFFERENCES between asphalts, coal-tar pitch, tar and other bituminous roofing materials, and where to use each type

FLASHING details and principles of good practice

HOW to compute gutter and leader sizes from rainfall data

WHERE and how to use insulation and ventilation for comfort and economy

AMERICAN ARCHITECT
REFERENCE DATA
NO. 16, FEBRUARY, 1935

XUM

# Roofing Materials

AMERICAN ARCHITECT REFERENCE DATA NO. 16, FEBRUARY 1935

By TYLER STEWART ROGERS, Technical Editor
in collaboration with WALTER McQUADE, A.I.A.

FIVE things govern the selection of roofing materials for any specific building: pitch of the roof deck; weight of the roofing material or ability of an existing roof structure to support a light or heavy surfacing; initial and ultimate cost; protective value and durability; and, finally, appearance.

Often the first four of these factors are so self-evident that the designer's interest is immediately concentrated on the relative appearance values of several kinds of roofing of a given type. But when the roof pitch is in the intermediate area between flat and steep; when weight, initial cost, or durability are significant; and even when appearance factors such as texture, scale and details of assembly, must be worked out with care, a great deal of data normally scattered through many handbooks, manuals and catalogs must be available for study if the designer's final selection is to be well considered.

For convenient reference, roofing materials are here grouped into three broad classes: waterproof roofing suitable for flat- and low-pitched roof decks; sheet roofings used on pitched roofs; and unit roofings of shingle type which depend upon pitch for their water-shedding ability.

## PITCH OF ROOF DECK

THREE methods of designating pitch or slope of roof decks are used and must be clearly understood by the designer.

**(1) Vertical Rise** in inches to each foot of horizontal run. For example—"six inches to the foot." This method is favored by carpenters because they can lay out their angles for framing the roof with an ordinary foot rule or square, and without a knowledge of trigonometry or the use of a protractor.

**(2) Angle,** measured in degrees and minutes, between the roof slope and the horizontal. Example: "a pitch of 45° 0′" which is the equivalent of a twelve inch rise to the foot. This method is favored in steel fabrication because of the common use of protractors and accurately graduated guides on machines employed in cutting and assembling steel framing. However, the vertical rise method can be quickly adapted by steel workers and therefore is of broader usefulness.

**(3) Pitch, or height in relation to span,** expressed as a fraction denoting the ratio of the total rise of the roof to its total span. Example: a roof rising 10 feet and having two equal sides spanning a total distance of 20 feet would have a "½ pitch or slope."

This method is impractical and confusing and should be abandoned. It does not apply to unequal slopes or to single slopes unless both the designer and the contractor understand that in such cases a theoretical total span equal to twice the horizontal projection of the slope is used in figuring the pitch.

Table 1 shows the angle and pitch designations for all roof slopes from dead flat to a rise of 20 inches to the foot. It also approximately indicates the limits of pitch recommended for different types of roofing materials. No fixed limits of pitch exist for each type of roof, for the permissible or required slope is influenced by both climate and design.

## WEIGHT OF ROOFING MATERIALS

IN designing the roof structure of new buildings the dead weight of the roofing materials must be taken into consideration, and these vary widely as indicated in Table 2. Conversely, in existing buildings which are to be re-roofed the load bearing capacity of the present structure may definitely limit the type of roofing than can be used safely. In terms of construction cost, the heavy roofing materials can be used most economically on roofs of relatively steep pitch or short span, or both; otherwise the dead weight of the surfacing will require increased depth and decreased spacing of rafters and purlins, or increased thickness and reinforcement of concrete or other masonry slabs.

# UNIT ROOFING MATERIALS

THE term "unit roofings" is here employed to designate shingles, tiles, slates, etc. which are laid as individual units and which rely upon the incline of roof and the overlap of units for shedding.

## WOOD SHINGLES

ESSENTIALLY an American roofing material, wood shingles are still the predominant roofing for residences in this country. Their life varies widely according to grade of shingle, pitch of roof, exposure, climate, and subsequent maintenance. The



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## TABLE I. PITCH OF ROOFS

**Equivalent pitch designations and approximate limits of pitch for basic types of roofing.**

| Equivalent Pitch | | | Approximate Roofing Materials by Type | Per cent of roof area over plan area; less overhang |
|---|---|---|---|---|
| **Vertical Rise** inches per foot of horizontal run | **Angle** formed by slope with horizontal (nearest 5') | **Pitch** or slope. Ratio of rise to total span | | |
| dead flat | 0 | 0 | Coal-tar pitch and felt with slag, gravel or tile top surface or asphalt and felt, for dead flat to slight slopes according to materials and nature of roof deck. | 0 |
| 1 | 4°45' | 1/24 | | 0.34 |
| 2 | 9°30' | 1/12 | | 1.4 |
| 3 | 14° 0' | 1/8 | Asphalt and felt built-up roofings. Special types may be used on slopes up to 9" per foot. | 3.1 |
| 4 | 18°25' | 1/6 | | 5.4 |
| 5 | 22°40' | 5/24 | | 8.3 |
| 6 | 26°35' | 1/4 | | 11.8 |
| 7 | 30°15' | 7/24 | | 15.8 |
| 8 | 33°40' | 1/3 | Wood, asphalt, asbestos-cement shingles permissible on slopes from 6" per foot up, but better on slopes 10" per foot and steeper. | 20.2 |
| 9 | 36°50' | 3/8 | | 25.0 |
| 10 | 39°50' | 5/12 | | 30.2 |
| 11 | 42°30' | 11/24 | | 35.6 |
| 12 | 45° 0' | 1/2 | | 41.4 |
| 13 | 47°20' | 13/24 | | 47.6 |
| 14 | 49°20' | 7/12 | Slate, clay tile, interlocking metal shingles and tiles. | 53.7 |
| 15 | 51°20' | 5/8 | | 60.0 |
| 16 | 53°10' | 2/3 | | 66.7 |
| 17 | 54°50' | 17/24 | Copper, tin, terne-plate sheet metal roofings with soldered joints on decks under 2" - 3" pitch; lead in limited areas under 2" - 3" pitch; Above metals plus zinc and aluminum without soldered or welded seams above 2" - 3" pitch. Also canvas. | 73.2 |
| 18 | 56°20' | 3/4 | | 80.3 |
| 19 | 57°40' | 19/24 | | 87.2 |
| 20 | 59° 0' | 5/6 | | 94.3 |

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normal expectancy is generally from 15 to 30 years; sometimes more. Treatment with preservatives before or after laying, and occasional treatment when they show signs of deterioration, will considerably extend their useful life. The woods used are cypress, cedar and redwood, which constitute the durable grades. White and yellow pine, and spruce make inferior shingles and are rarely used.

Wood shingles may be employed on roof inclines rising 6 or more inches per foot; some authorities recommending 8 inches to the foot as minimum. Standard sizes and approximate weights are shown in Table 2. Each of the standard lengths is made in three grades defining the minimum and the maximum width of the shingle. No. 1 shingles must be all edge-grain strictly clear and containing no sapwood. Nos. 2 and 3 grades permit slash grain and certain defects established by the grading rules.

The roof deck may be laid open or tight, the latter being preferred for greater insulation value; the former largely for economy. Wood shingles in themselves have higher insulating value than any other roofing, but the difference in cost between a tight sheathing or open sheathing is more than offset by the superior protection afforded by the solid deck.

Exposure of wood shingles is based on the rule-of-thumb method that not more than one-third of the total length shall be exposed on roofs and not more than one-half on side walls. See Table 3.

Nails used should be either hot dipped zinc-coated iron cut, hot dipped zinc-coated steel-and-copper, or copper nails in sizes shown in Table 3 or in larger sizes to give secure grip on the wood sheathing or shingle lath where hand-split heavy butt shakes are employed, or where the nails must penetrate an existing shingle roof. Specify two nails to each

## TABLE II.

# Comparative Roofing Data

### American Architect Reference Data Number 16 "Roofing Materials" February, 1935

| Kind of Roof | Materials or Type | Permissible Slope in inches per foot | | Approx. Weight per 100 sq. ft. in pounds | Type of Roof Deck | Unit Sizes | Application Data |
|---|---|---|---|---|---|---|---|
| | | Minimum | Maximum | | | | |
| WOOD SHINGLES | Red cedar<br>Cypress<br>Redwood | 6" preferably 10" to 12" | Vertical | 200 | Tight Sheathing or Shingle Lath. | Standard<br>16" long, 5 butts in 2"<br>18" " 5 " " 2¼"<br>24" " 4 " " 2"<br>Shakes and specials<br>25" to 30" ½" to 1½" butts | For exposure data and nail sizes see Table 3. |
| ASPHALT SHINGLES | Asphalt saturated felt with mineral granule surfacing | 6" preferably 10" to 12" | Vertical | 130 - 150 | Tight Sheathing | Strip shingles<br>10" to 13½" deep 36" wide<br>Single units<br>9"x12", 12"x16" and manufacturer's specials | Usually laid 4" to 5" to the weather, depending on form. |
| ASBESTOS-CEMENT SHINGLES | Rectangular<br>Hexagonal<br>Dutch Lap | 6" preferably 10" to 12" | Vertical | 600 - 650<br>275 - 325<br>275 - 325 | Tight Sheathing | 6" to 16" wide, 16" - 18" long<br>16"x16" average<br>16½"x16½" average | 2" head lap - see Table 4<br>About 3" lap on top edges<br>⅓ or ¼ side lap. |
| SLATE | Commercial (3/16 smooth)<br>Textural (heavy, rough) | 4" depending on lap | Vertical | 3/16" 750<br>¼" 900<br>3/8" 1400 | Tight Sheathing or Nailing Compound | Lengths, standard 12" to 24"<br>Widths 6" to 14" depending on length. | See Table 4 for head laps and exposure to weather. |
| | Tile for flat roofs | Slate tile on flat roofs | 1" - 2" | ½" 1800<br>¾" 2700<br>1" 3600 | | Other sizes on order | Flat deck tile set in compound. Weight about ½ of lapped shingles of same thickness. |
| CLAY TILE | Mission | 4" - 6" | About 15" | 1200 - 1450 | Tight Sheathing with Battens | 14" to 18" long, 7"- 8" wide | Lapped 3" at head |
| | Spanish | 4" - 6" | About 15" | 800 - 900 | Tight Sheathing or Nailing Compound | 13" to 14" long, 9"- 10" wide | 3" single head lap |
| | Roman and Greek | 4" - 6" | About 14" | 1100 - 1300 | | About 12½" long, - 10" wide | 2¾"-3" single head lap |
| | French | 4" - 6" | About 15" | 800 - 900 | | 16 long, 9" wide | 3" single head lap |
| | English | 4" - 6" | About 15" | 800 - 900 | | 11"- 14" " 8"- 9" " | 3" single head lap |
| | Shingle | 6" | Vertical | 1200 - 1800 | | 12"- 16" " 6"- 8" " | 2" head lap (See Table 4) |
| | Promenade | ¼" | 1" - 2" | 1200 - 1500 | Built-up Membrane | 6"x6", 9"x9" to 6"x12" | Laid in compound |
| METAL SHINGLES AND TILES | Tin or Terne-plate<br>Galvanized iron<br>Zinc<br>Copper<br>Aluminum<br>Enameled iron | 4" - 6" preferably 8" to 12" | According to style of roof | 100 - 140<br>105 - 160<br>120 - 130<br>120 - 190<br>60 - 70<br>240 - 250 | Tight Sheathing | Tile shapes about 10"x14"<br>Shingle shapes about 7"x10" or 10"x14"<br>Various patterns according to manufacturer<br>About 12"x12" | All types are interlocking with an average head and side lap of 2". Special units made for ridges, eave starters and hips, etc.<br>Exposure about 10" x 10" |
| | Cast iron | 4" | | 1080 | Purlins | 24"x52" - 3/16" thick | Interlocking - self supporting |
| SHEET METAL ROOFINGS | Copper | ¼" | Vertical | 100 - 160 | Tight Sheathing | 16 oz. and heavier - sheets and strips: width multiples of 2"- 96" long | See text and illustrations |
| | Lead | ¼" | | 250 - 600 | | Hard: 2½ to 3 lbs. soft 4 to 6 lbs. | " " " " |
| | Zinc | 2" | | 100 - 150 | | Use No. 11 zinc gauge or heavier sheet sizes same as copper. | " " " " |
| | Aluminum | 3" | | 60 - 70 | | 18 ga. 24"x96", 30"x96", 24"x120" 30"x120" | Insulate with 30# asphalt felt |
| | Tin or Terne-plate<br>Galvanized iron | ¼"<br>¼" | | 75 - 100<br>75 - 100 | | Usually IX (about 28 gauge) sheets 20"x28" and 14"x20" | See text and illustrations |
| BUILT-UP ROOFINGS | Asphalt and felt for sloping roofs | 2" | 6" Special if steeper | Smooth top 150-250<br>Gravel top 550-600<br>Slag top 450-500 | Various Constructions for Each Type | Number of plies and weight of felt; also composition of felt varies according to manufacturer's specifications.<br>Usually 2 to 3 plies bonded for 10 years; 3-4 plies, 15 years and 4-5 plies, 20 yrs. | Always follow manufacturer's specifications for exact conditions of slope, type of deck and length of life desired. |
| | for flat roofs | 0 to ½" | 3" - 4" | Smooth top 150-250<br>Gravel top 550-650<br>Slag top 450-550 | | | |
| | Coal-tar Pitch and Felt for flat roofs | 0 | 1" - 2" occasionally steeper | Gravel top 600-675<br>Slag top 450-575 | | | |

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shingle (neither more nor less) to be covered by the next course at least 1 inch; spacing between shingles not less than 3/16" nor more than ¼"; vertical joints breaking at least 1¼".

## ASPHALT SHINGLES

COMPETING with wood shingles in cost and relative durability and offering a measure of fire resistance due to the mineral surfacing commonly employed, asphalt shingles have been neglected by architects primarily because of their mechanical uniformity and often gaudy colorings. Recent trends promise the development of asphalt shingles for architectural purposes as already evidenced by shingles with extra-heavy butts to give suitable shadow lines and carefully considered surface colors having good design possibilities.

They are manufactured of strips of heavy asphalt-impregnated felt surfaced with crushed slate, stone or other mineral or manufactured granules embedded in a surface coating of asphalt. The strips are then machine stamped to shape; the common forms being square butts with slots to suggest vertical joints of shingles, elongated hexagonal or diamond butts, and individual shingles of various sizes, some with slots or special provision for interlocking the units on the roof.

Standard sizes and weights are indicated in Table 2. The normal exposure of 12-inch shingles ranges from 4 to 5 inches. The usual grades are standard weight and extra heavy (jumbo, giant, thick butt, etc.) They should be nailed with two or three large-headed galvanized, zinc-clad, or copper nails over tight boarding; nails being placed just above the line of exposure to promote rigidity.

**Special types** include cork-backed asphalt shingles having a layer of granulated cork embedded in asphalt on the under side; and metal-clad asphalt shingles having a top surface of lightweight sheet copper.

## ASBESTOS CEMENT SHINGLES

ASBESTOS cement shingles, manufactured of a mixture of Portland cement, asbestos fibre and pigment formed under extreme pressure and suitably aged or cured, constitute a fireproof and enduring roofing material. The principal types are textured unit shingles designed to closely imitate weathered wood shingles; smoother surfaced units having the characteristic of commercial slates; and hexagonal and Dutch lap types which have no architectural precedent but require minimum lap and are consequently low in cost on the finished roof.

In the cheaper grades the color is not enduring because the surface coating is too thin and erodes or fades, leaving the natural light gray tone of the base mixture. The better grade asbestos cement shingles have substantially permanent colors. Efflorescence occasionally develops on these roofs and may show on very dark shingles or those of pronounced color.

**TABLE 3. WOOD SHINGLE DATA**
Based on One Square (100 sq. ft.)

| | Standard Lengths | | |
|---|---|---|---|
| | 16" | 18" | 24" |
| Standard thickness.... | 5 butts 2" | 5 butts 2¼" | 4 butts 2" |
| *Bundles per square— | | | |
| —roofs ..... | 4 | 4 | 4 |
| —side walls ..... | 4 | 4 | 3 |
| #Exposure to weather | | | |
| —roofs ..... | 4" to 5" | 4" to 5½" | 6" to 7½" |
| —side walls ..... | 5½" to 7½" | 6" to 8½" | 6" to 11½" |
| Nail size, minimum.... | 3d (1¼") | 3½d (1⅜") | 4d (1½") |
| Nails required per square, approx. .... | 3 lbs. 5" exp. | 3 lbs. 5" exp. | 3 lbs. 7" exp. |

*Net area covered varies with exposure. Add 6% to 10% for waste.

#Varies with slope and climate; use minimum exposure on slopes under 10" to the foot and in severe climates; use greater exposure for steep slopes and where climate and rainfall are moderate.

Hexagonal and Dutch lap shingles are shaped and nail punched for a specific method of laying and when used should be installed strictly according to the manufacturer's recommendations. The Dutch lap type is a rectangular shingle laid with a 3-inch head lap and a 4 or 5-inch side lap, offering somewhat less weather protection than the hexagonal or standard shingle types.

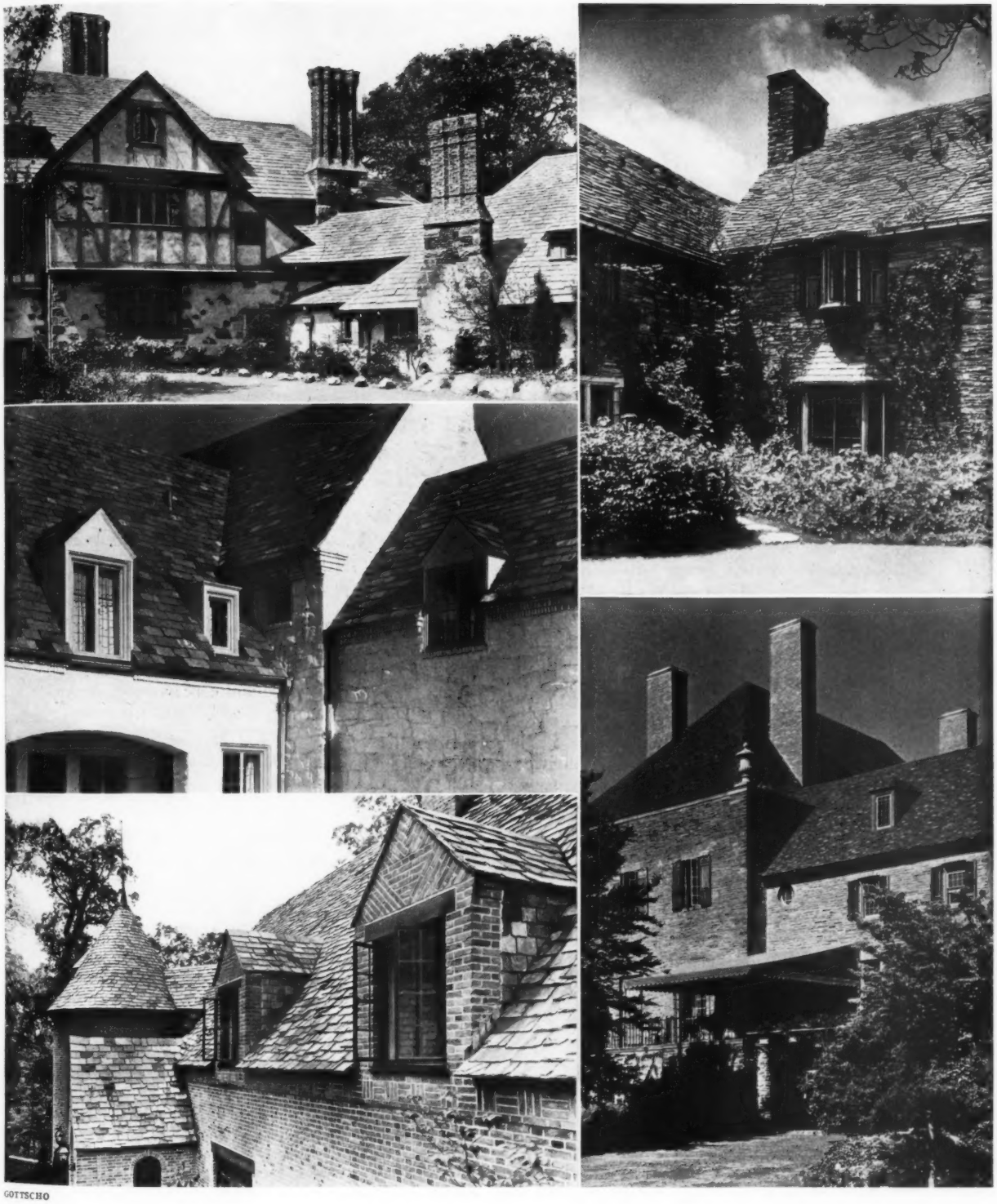
The shingle units are laid similarly to slate: that is, with a double lap, except that with asbestos shingles the lap is usually 2 inches and vertical joints are broken at least 2 inches. An impregnated roofing felt weighing 15 lbs. per square is used under standard weight shingles and 30-lbs. under the higher quality heavy-weight thick butted shingles. Nails employed should be the same as for slates.

## SLATE ROOFING

SLATE constitutes a durable, impervious, moderate cost roofing of wide architectural utility and long standing precedent. Slates employed should be considered in three ways: thickness and texture, color and permanence of color, and grade.

Thickness and texture are usually related inasmuch as the commercial slate of 3/16 inch thickness must be split from blocks that have smooth, uniform cleavage producing an effect of considerable uniformity on the roof unless laid in graduated courses and random widths. Heavier slates, as listed in Table 2, usually show a rougher surface and produce a roof having a definite texture which can be developed according to the architect's requirements by combining different thicknesses and sizes.

The design of a suitably textured slate roof is a task demanding a sympathetic understanding of precedent if the result is to be entirely satisfactory. Originally textured and graduated roofs resulted from the hand quarrying of the stone, the necessity of utilizing all thicknesses and lengths as quarried, and the purchase of the quarry output by the ton. The heavier and larger slates were laid on the lower end of the rafters over the wall supports and the



GOTTSCHO

Studies in scale, texture and contrast in unit roofings indicating scope of treatment available to designer and importance of relating roof to side-wall treatment. Left; top: Tuxedo Club, Tuxedo Park, N. Y.; office of John Russell Pope, architects. Center, Residence of M. M. Van Beuren, Middletown, R. I.; Harry T. Lindeberg, architect. Bottom, Residence of Louis Wilputte, New Rochelle, N. Y.; Julius Gregory, architect. Right; top: Residence of E. T. Gardner, Dayton, Ohio; Peabody, Wilson & Brown, architects. Bottom, Residence of Harry F. Knight, St. Louis, Mo.

smaller and lighter pieces distributed over the length of the rafters, utilizing all material with minimum waste. Artificial mixing of graded sizes and thicknesses as manufactured today does not produce a comparable effect in the hands of the average roofer unless his work is skillfully supervised.

The following color nomenclature for slate has been adopted as a simplified practice by the Bureau of Standards:

| | | |
|---|---|---|
| Black | Blue gray | Mottled purple and green |
| Blue black | Purple | Green |
| Gray | Purple variegated | Red |

These color designations should be preceded by the word "unfading" or "weathering" according to the ultimate color effect that may be desired.

Unfading slate will hold its original color except for weathering or softening of colors due to local climatic conditions. Weathering slates will actually change color to tones of light gray, yellow and brown, and this change cannot always be predicted. The producer's classification of his slates as weathering or unfading can usually be relied upon. But because different quarries produce different kinds and grades of slate, there are limitations as to the kinds that can be obtained from any one district.

Quality is indicated by grading rules which vary with each major district but substantially the first quality are true to size and thickness and free from blemishes or ribbons. The second may be less smooth and uniform and lower qualities may contain ribbons or soft streaks which are considered as impairing the durability of roofs if the ribbons are laid exposed, though of minor importance if they do not show when laid.

All slates should be laid on roofer's felt, using 15-lb. impregnated felt for commercial thickness (3/16" slate) and 30-lb. impregnated felt on textural roofs (the term "textural" being used in the trade to indicate heavier, rough-surfaced slate roofs).

The deck should be of tight wood sheathing in frame construction, or in fireproof work of suitable nailing compound on the masonry structural slab. The felt should be laid horizontally and lapped 3 inches with the joints mopped with hot pitch on masonry or nailed on sheathing.

In slating parlance exposure is expressed by the amount that a given slate laps the second slate beneath. Proper exposure is obtained by deducting the required lap from the length of the slate used and dividing by two. For example: if the specified lap is 3 inches and the slate is 24 inches long, the exposure is $24 - 3 = 21 \div 2 = 10\frac{1}{2}$ inches.

The required lap for various slopes and the resulting exposure is shown in Table 4.

On roofs rising from 1 inch to 4 inches to the foot slate is laid without lap in roofing pitch or asphalt made for the purpose over a built-up waterproof membrane roof.

Common standard methods of forming ridges, hips and valleys are indicated in Fig. 1 but the designer is free to develop roof surfaces in wide variety providing proper lap is given at all points. All slates should be nailed with at least two large-headed wire or slaters' cut nails of copper, brass or non-corroding alloy metals.

**TABLE 4. EXPOSURE OF ROOFING SLATES**

| Length of Slate in inches | Exposure in inches for roof inclines of: 4 to 8" per foot (4" lap) | 8" to 20" per foot (3" lap) | Over 20" per foot (2" lap) |
|---|---|---|---|
| 10 | 3 | 3½ | 4 |
| 12 | 4 | 4½ | 5 |
| 14 | 5 | 5½ | 6 |
| 16 | 6 | 6½ | 7 |
| 18 | 7 | 7½ | 8 |
| 20 | 8 | 8½ | 9 |
| 22 | 9 | 9½ | 10 |
| 24 | 10 | 10½ | 11 |

## TILE ROOFING

TILE roofing units in the commonly accepted meaning of the term are made of burned clay, shale or terra cotta. The shapes characteristic of the clay tiles are produced also in asbestos cement, Portland cement, sheet metals (including galvanized iron, copper, zinc, tin and aluminum) enameled metals, glass and cast iron. Originally wood shingles were considered to be wood tiles.

There are six main types of clay tiles as follows:

**Mission Tile** of semi-cylindrical shape either tapered or straight-sided and laid in alternate horizontal courses with the converse and concave sides up and overlapping to form covers and pans.

**Spanish Tile** have a round surface and an interlocking side joint which takes the place of the concave pan in a Mission tile roof.

**French Tile** are flat tile with heavy flat-corrugated surface and an interlocking flush joint at the side.

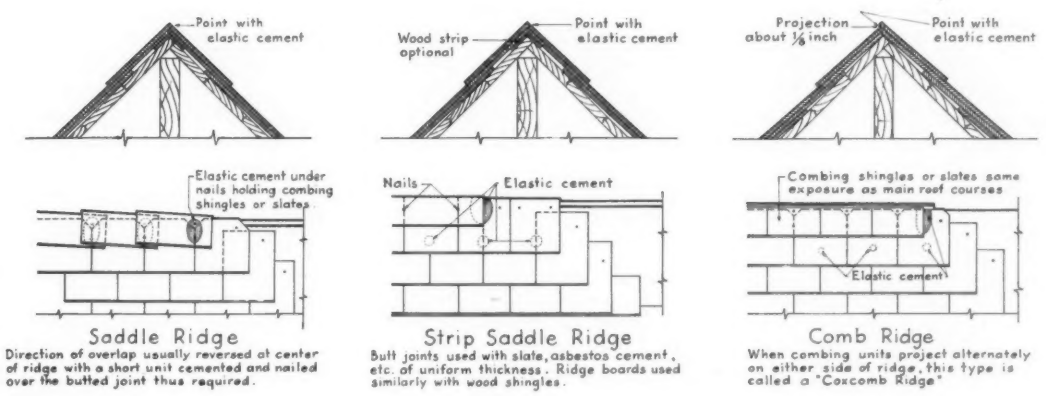
**English Tile** are flat tile with smooth tops and interlocking side joints.

**Shingle Tile** are similar to slates, being of approximately ½ inch thickness and rectangular shape.

**Promenade or Quarry Tile** are unglazed rectangular or square flat tile, usually solid red in color, for use as a traffic surface on flat roofs over a waterproof built-up roofing membrane.

Clay tile should be hard burned if used in temperate and northern climates, the softer types manufactured and used in the tropics being insufficiently resistant to erosion and frost action for use elsewhere. All tile should be laid over 30-lb. or heavier impregnated felt and fastened with copper nails or tied with heavy copper wire. They are usually laid on roofs having a pitch exceeding 6-inch rise per foot, particularly in northern climates; if laid on somewhat flatter pitches the butts of Mission and Spanish tiles must be bedded in cement mortar, which does not allow for movement on the roof and consequently introduces danger of cracked tiles.

# DETAIL OF UNIT ROOFING - SHINGLE TYPE

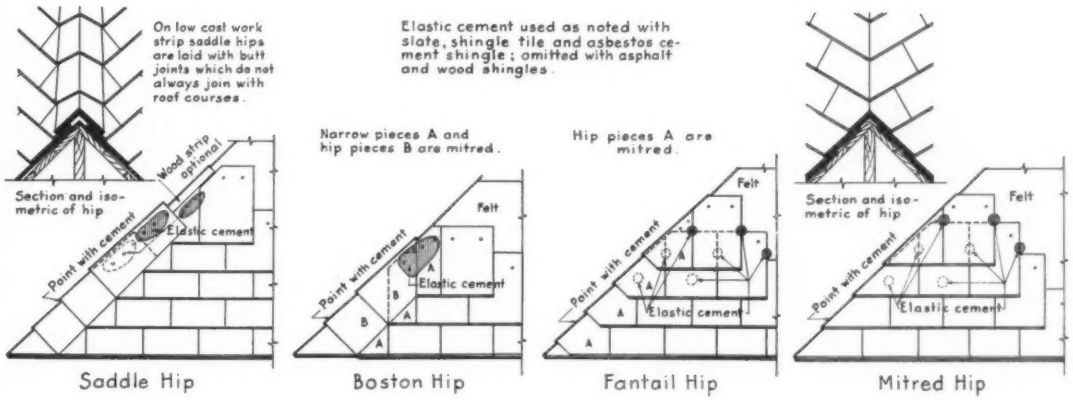



**Saddle Ridge**
Direction of overlap usually reversed at center of ridge with a short unit cemented and nailed over the butted joint thus required.

**Strip Saddle Ridge**
Butt joints used with slate, asbestos cement, etc. of uniform thickness. Ridge boards used similarly with wood shingles.

**Comb Ridge**
When combing units project alternately on either side of ridge, this type is called a "Coxcomb Ridge"

## STANDARD RIDGE DETAILS



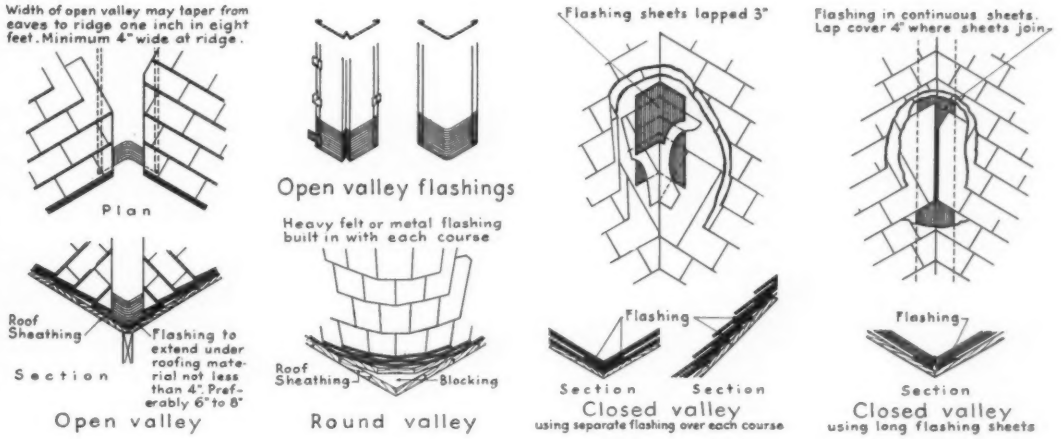

**Saddle Hip**

**Boston Hip**

**Fantail Hip**

**Mitred Hip**

## STANDARD HIP DETAILS




**Open valley**

**Round valley**

**Closed valley**
using separate flashing over each course

**Closed valley**
using long flashing sheets

## STANDARD VALLEY DETAILS

FIGURE 1

Mission tile requires wood battens under the cover tiles to partly support their weight and to provide a nailing point. The lapping of interlocking tiles is established by the form of the tile itself. Usually the head lap is 3 inches. Shingle tiles are usually lapped like slate with a 2-inch head lap over the alternate courses beneath. See Table 4.

**Cement roof tile** are made in both shingle and Mission shapes. They are used chiefly in commercial work and are usually flat in shape and in sizes 12x 24″ and larger. They have interlocking side laps and usually interlocking head laps.

**Glass tile** are manufactured for use in conjunction with clay tiles of various types over open purlin construction to form skylights of minimum prominence on the roof. The tiles are wired to the purlins and are usually themselves reinforced after the manner of wired glass.

**Metal tile** are substantially lighter in weight than mineral tiles and have the same properties of endurance as are noted elsewhere for sheet metal roofs of the same materials. They are necessarily uniform in shape and have the mechanical regularity of a machine-made product and of interlocking clay and cement tile units. They permit the use of a lighter roof construction and usually a 15-lb. roofing felt is used over the deck.

**Cast iron** roofing tiles are made for industrial purposes and, like the large cement tiles of similar character, are usually laid directly on steel purlins spaced at proper intervals. All other types of tile roofing are laid on tight decks of wood or nailing compound.

## METAL ROOFINGS

THERE are three basic types of metal roofings: flat sheet roofings assembled with seams of various types, corrugated sheet roofings, and unit roofings formed out of metals in the shape of Spanish tile, flat tile, or shingles. The principal metals used are copper, zinc, lead, aluminum, galvanized iron, tin-plate, terneplate, and cast iron.

### SHEET METAL ROOFINGS

THE normal way of installing sheet metal roofs is to assemble on the roof individual sheets of limited size, using joints or seams of one of the types indicated in Fig. 2. Except on roofs having a pitch of 3 inches to the foot or less, the use of soldering or welding to assemble the sheets is minimized and confined largely to ridges and hips where the fitting of members cannot be done with a standard type of seam. The purpose is to allow adequate room for expansion and contraction under changes of temperature, for this inevitable movement constitutes the principal problem in the design of successful metal roofings. For the same reason as well as for water-tightness, none of the sheets are nailed directly to the root deck but are held in place with cleats of the same metal which are first nailed to the roof and then incorporated in an adjacent seam.

Inasmuch as electrolysis may develop between any two unlike metals, it is essential that the nails, cleats and other accessories be of the same metal as the main roof. Even aluminum nails are made for use with aluminum roofing, but copper nails may be used with lead roofing. Whenever two dissimilar metals come together they should be insulated from each other by (a) separating the metals with saturated felt, (b) separating the metals by a strip of sheet lead, (c) heavily tinning the iron as is often done with iron or steel gutter and leader supports, or (d) coating both metals with bituminous paint.

The choice of seam is governed by considerations of appearance, the incline of the roof, and the coefficient of expansion of the metal in relation to the size of the entire roof area. Batten seams and standing seams provide for expansion and break up the monotony of an otherwise uniform metal roof. They should be spaced with some consideration to the scale of the building or the roof area. The standard dimensions given in Fig. 2 are normal, and the spacing of standing or batten seams should be computed according to the width of the metal sheets to minimize waste and extra labor of cutting.

Flat seams, soldered, may be used on slopes from ¼ to 3 inches per foot; unsoldered horizontal seams on steeper pitches. Standing seams may be used on slopes rising 2½ inches per foot or more. Batten seams may be used on slopes of 3 inches per foot and greater.

Sheet metal roofing practice has become too well standardized to require detailing here, and reference should be made to standard handbooks and to manuals of the various metals manufacturers.

**Copper** is made in two tempers: soft or roofing temper (abbreviated R. T.) for all roofing and flashing work wherever the shaped or formed work is supported, as in built-in or box-gutter linings, etc.; and hard or cornice temper (abbreviated C. T.), for hanging gutters, eaves, troughs, leaders, cornices, unit shingles, or wherever stiffness is necessary to support or maintain the shape of the work.

For all ordinary roofing work and flashings not less than 16-oz. copper is employed. Heavier metal of 20 or 24-oz. weight should be used for flashings in heavy tile roofs, particularly Mission tile, where the shape causes drainage to strike the flashings in concentrated streams. Avoid use of copper sheets or pans under the concentrated fall of quantities of water to minimize erosion.

Roofing copper is stocked in sheets which are multiples of 2 inches in width and 96 inches in length. The expansion of copper is more than that of iron or steel but less than that of other roofing metals. Normally, the vertical seams—particularly the standing or batten seams—provide adequately for temperature movement. When a flat deck is to be roofed with copper and all joints must be soldered, sheets 14″x20″ should be used and held to the roof with three copper cleats to the sheet. Expansion is taken care of by slight bulging of the

sheets, but contraction requires that runs longer than 30 or 40 feet be provided with expansion joints. Such joints should also be specified at the high point of gutters if the runs exceed 70 feet with free ends or 40 feet where movement is limited.

**Lead-coated copper** has the strength and relatively light weight of copper and the enduring gray color of lead. It may be used with leadwork (see lead roofing) but its installation should follow sheet copper practise.

**Lead**, like copper, is made in two kinds: soft lead, manufactured according to A. S. T. M. specifications, and hard lead, containing 6 to 7½ per cent antimony which gives it greater stiffness and strength, and permits use of thinner material. Weights commonly used are: hard lead, 2½ to 3 lbs. per square foot, (5/128 to 3/64 inch thick); soft lead, 4 to 6 lbs. per square foot, (1/16 to 3/32 inch thick). The lighter weights of each material should be used only for small roofs where battens are spaced 24 inches or less on centers, or for cap flashings; the heavier sheets should be used for roofing, base flashings and gutter linings.

Lead has a considerably greater coefficient of expansion than copper and therefore should never be confined so that it cannot expand and contract freely. Roofs may be either batten or standing seam type. Sheets not larger than 2'x4' should be used except in special cases, and cleats should always be employed for attachment to the roof deck. Preferably seams should come every 18 inches. Always specify a 30 or 40 lb. roofing felt to be laid under the lead.

**Aluminum** roofing is commercially pure metal of 18 gauge thickness weighing .568 lbs. per square foot. Its color is a lead-toned gray (not the bright color familiar in the polished metal). It is an enduring material, the maximum life of which is unknown.

Aluminum is used over a 30-lb. asphalt saturated felt and should always be protected by insulation from dissimilar metals by such felt or by painting with bituminous paint. Also use bituminous paint on aluminum flashings embedded in mortar joints or against concrete.

Sheet aluminum roofing can be applied on any slope not less than 3 inches to the foot, using batten seams with either wood or aluminum battens, or standing seams. Wood battens should not be spaced farther apart than 24 inches and should be worked out to allow the use of aluminum stock sheets as given in Table 2. Special aluminum battens are available with extruded cap sections. The expansion of aluminum is between that of copper and lead and should be amply provided for in the design of seams. The manufacturer's recommendation for proper temper and gauge for the sheet should always be observed. Soldered joints should never be attempted, and welded joints used only when essential. Lap seams not welded should lap at least 4 inches.

**Galvanized iron, tin and terneplate** roofings may be considered together because their treatment is substantially the same. Standard installation practice is found in all handbooks and is well understood.

Galvanized iron roofing should not be painted until it has been exposed to the atmosphere for a year or more, or until it shows rust spots. The reason for this is that the sal ammoniac remaining on the sheet after galvanizing prevents the adhesion of paint. This must be cleaned off with a diluted acetic acid if paint is to be applied before it has been removed by the action of the elements. Painted sheet metal roofing, however, should be painted immediately after application as it is only prime coated at the mill, and all painted metal roofs should be repainted every five years.

**Zinc** makes an enduring roof under most conditions of service and is used after the manner of copper and aluminum, with the exception that it is not recommended for flat roof decks. It is a more brittle metal requiring the use of an especially ductile roof sheet for successfully forming the seams. The following characteristics should be noted:

Zinc gauges are not the same as those used with other metals. Low numbers in zinc gauge represent the thinner sheets while low numbers in Brown & Sharpe and U. S. Standard gauges represent the heavier sheets. Therefore, always designate thickness in "zinc gauge" or in decimal parts of an inch. The standard roofing zinc is No. 11 zinc gauge, equivalent to No. 22 B & S, or .024 inch.

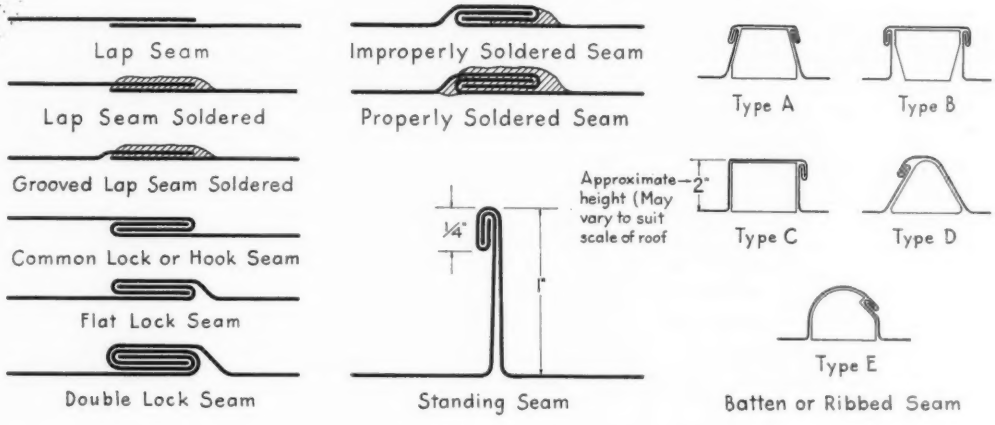
Do not use zinc with redwood, red cedar or oak. This excludes the use of zinc roofing or flashings in conjunction with most wood shingle roofs.

Zinc has the greatest coefficient of expansion among roofing metals, exceeding lead; hence maximum provision should be made for expansion and contraction by avoiding soldered joints, by the use of standing seam or batten seam construction, and where battens are employed, by providing a heavy undercut to permit movement. If battens are spaced over 18 inches apart, increase the weight of metal to 12 to 15 zinc gauge as recommended by the manufacturer. Use a good quality saturated and coated waterproof sheathing paper which is chemically neutral and has a glossy surface (not ordinary tar paper) between the zinc and the roof deck.

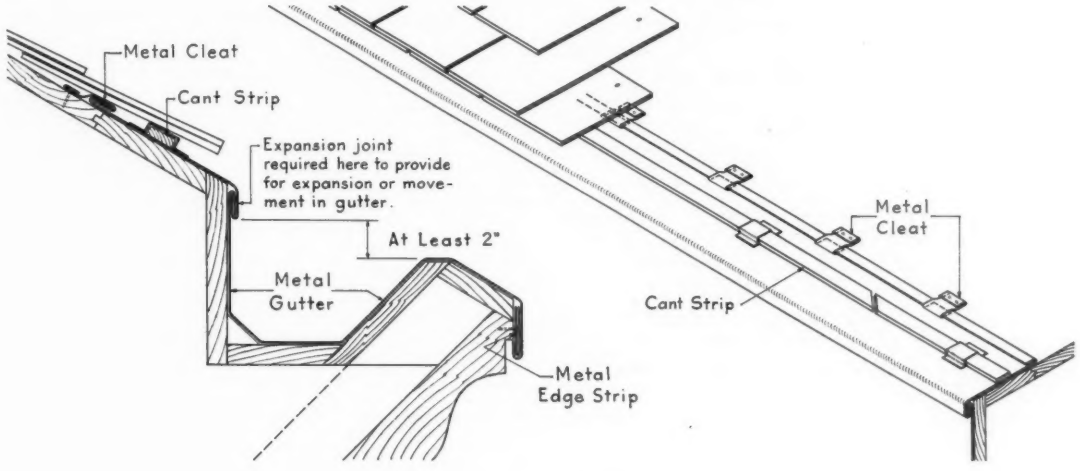
## CORRUGATED METAL ROOFINGS

WHILE primarily employed for industrial buildings, warehouses and other structures not frequently within the scope of architectural practice, corrugated metal roofings constitute an important classification. The principal metals used are galvanized iron (preferably copper-bearing); iron protected with asphalt and felt coatings and sometimes thin copper surface coatings applied in process of manufacture; copper; zinc; and aluminum. Standard practice in the application of corrugated roofings may be obtained from handbooks or from manufacturers' manuals. A non-metallic form is made of asbestos cement sheets.

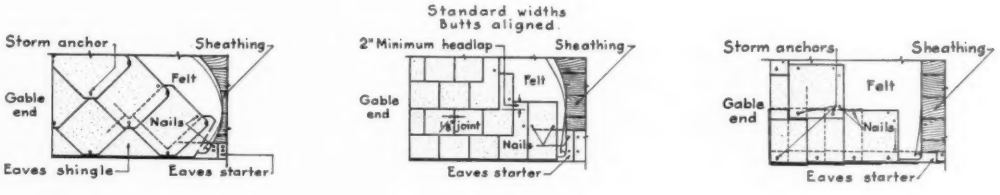
# ROOFING DETAILS




## STANDARD SEAM DETAILS




## METAL BOX GUTTER

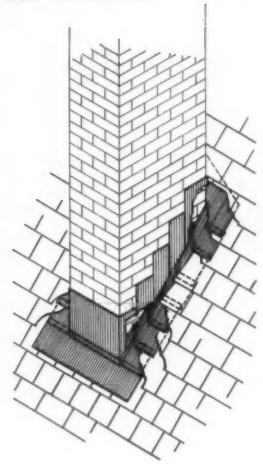



## METHODS OF LAYING CEMENT AND COMPOSITION SHINGLES

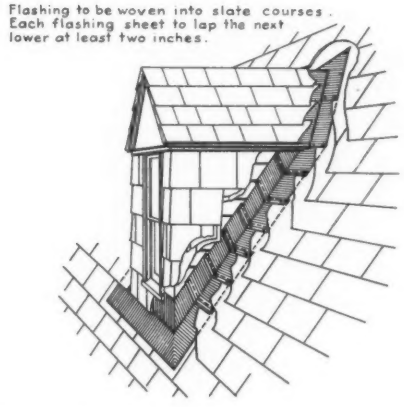
FIGURE 2

STATE COLLEGE OF AGRICULTURE AND APPLIED SCIENCE
LIBRARY
FEB 18 1935
MANHATTAN · KANSAS

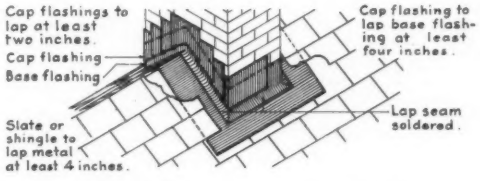
# ROOFING DETAILS



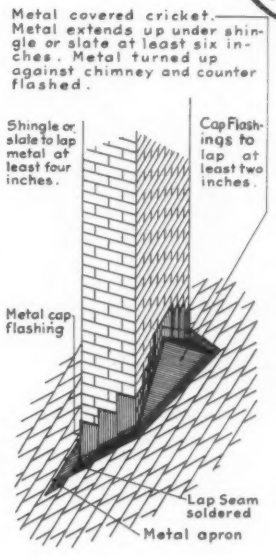

Built-in base flashing for chimney on slope




Built-in base flashing for dormer window



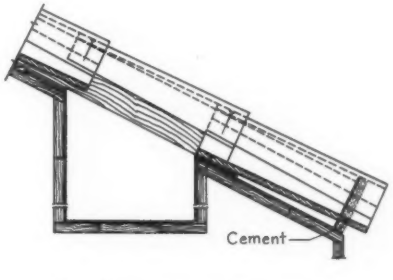

Flashing for chimney on ridge



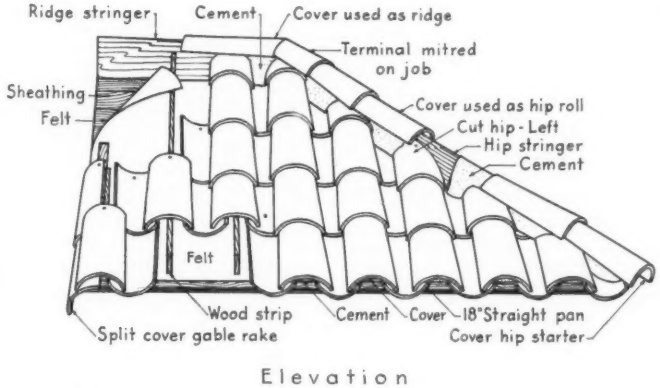

Flashing for chimney on slope

## STANDARD FLASHING DETAILS


Section showing split cover gable rake




Section showing cover over concealed gutter
Pan is omitted




Elevation

## MISSION TILE DETAILS

FIGURE 3

## FLAT AND LOW-PITCH ROOFS

IF the modernists are entirely right in their precepts, eventually all American buildings will have "flat" roof decks on the functional grounds that they are least expensive to construct and provide useful areas which have hitherto been neglected. Without arguing the merits or fallacies of this trend, it is quite obvious that the so-called flat deck or very low pitched roof is steadily growing in architectural importance and hence deserves special consideration.

The lack of standard nomenclature and the often conflicting claims and implications of competing manufacturers have brought confusion into this important field. The misuse of the words tar, asphalt, pitch and bitumen in specifications has sometimes resulted in securing the wrong type of roof for given conditions because the architect and roofing contractor have not understood the terms the same way.

In the hands of reputable built-up roofing manufacturers and contractors, this looseness of terminology has resulted in no harm, for such organizations have provided the correct material in order to protect their own reputations and to justify the offer of a bond guaranteeing the life of the roof for anywhere from ten to twenty years. The architect's greatest safeguard is still to insist upon accepting the proposals of only the most reputable roofing contractors, for all authorities agree that workmanship is of as much importance as material in determining the life of otherwise similar built-up roofs and that skilled and rigid supervision is a large factor in assuring satisfactory performance.

In all cases, the architect should so prepare his specifications that when the roofing contractor has been selected, the detailed specifications and installation methods recommended by the manufacturer of the products used shall be followed without any deviation whatsoever. Otherwise no guarantees can be enforced.

However, the most satisfactory assurance of good results is to be had if the architect understands the different characteristics and uses of the component materials and employs this knowledge to select in the beginning the correct types of built-up roofing for each part of his structure.

**Bitumen** should be used only as a generic term to embrace all asphalts, tars and pitches used in roofing.

**Asphalt** may be used to designate "natural (lake) asphalt" or petroleum (steam-distilled and blown-oil) asphalts or either type with various admixtures and should be used with a qualifying adjective if a particular product is desired. Both types are compounded to meet various roofing requirements and both are used on sloping roof decks because they have less tendency to sag or run under sun heat than coal-tar pitch. Technically the differences are chiefly that "natural" asphalt is somewhat more adhesive, more ductile and slower to oxidize and develop "cheesiness" than oxidized or blown-oil asphalt and it possesses some self-healing properties not common to the petroleum product. By self-healing is meant the ability to flow together and amalgamate after a crack has been formed; a property highly desirable in flat deck roofs but usually so accompanied by a tendency to sag or run under summer sun temperatures that it can seldom be relied upon in materials suitable for roofs inclined more than two or three inches to the foot.

Various solvents and fillers are used in compounding both types to form brushing asphalts, asphaltic cements, etc.; but for all built-up roofing work asphalts are applied hot and are solids at all temperatures naturally developed on roofs. The technology of bituminous products is so complex that architects must rely upon the experience and dependability of the manufacturer or roofing contractor unless they are prepared to test the products offered against such standards as those of the American Society for Testing Materials or Federal Specifications.

**Pitch** should be used to designate *coal-tar pitch* as distinguished from an asphaltic compound. Non-technically, coal-tar pitch is softer, has a lower melting point and greater resistance to water than asphalt and in addition is self-healing on "flat" roof decks. Therefore it is suitable for roof inclines sloping less than three inches per foot and seldom may be used on steeper inclines. Asphalts of suitable composition *may* be used on either sloping or flat decks but are not necessarily superior to coal-tar pitch on flat decks.

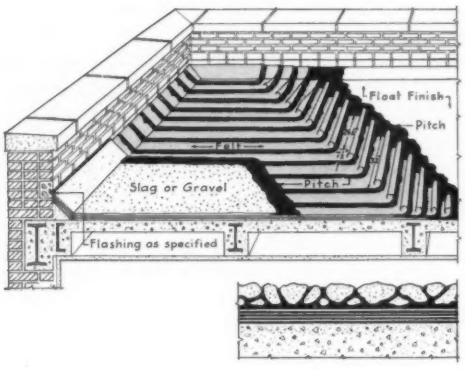
In comparing these two products non-technically it may be further noted that the natural self-healing property of coal-tar pitch is a distinct asset on roofs sloping so little that the pitch will not run off under sun heat. At the same time this low melting point may cause trouble on wood roof decks if the planking is not tight or the under felts sufficiently absorbent to prevent dripping through the deck in very hot weather. Under such conditions a higher melting point asphalt would be clearly indicated.

**Tar** should be used to denote a coal-tar product of a more volatile nature than coal-tar pitch from which the latter is produced by modern tar distillation processes. It is used in compounding coal-tar pitches and so-called "gums" of various types and for saturating felts that are used with coal-tar pitch bitumens. It is incorrect to use tar as a generic term embracing either asphalt or pitch roofings, or to use tar paper or tarred felt to indicate an asphalt saturated felt instead of a coal-tar felt or paper.

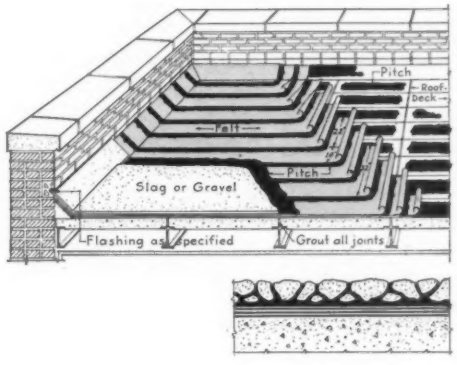
These terms are developed in detail here because of the need for greater clarity when specifying roofing types and roofing compounds. The technologist would go much further in distinguishing between these products and would note various compounds and blends which are not enumerated here. For all practical purposes adherence to these general distinctions will serve to clarify the architect's designation of built-up roofing materials.

**Felts** used for built-up roofings include dry or unsaturated felt, asphalt saturated felt, and coal-tar

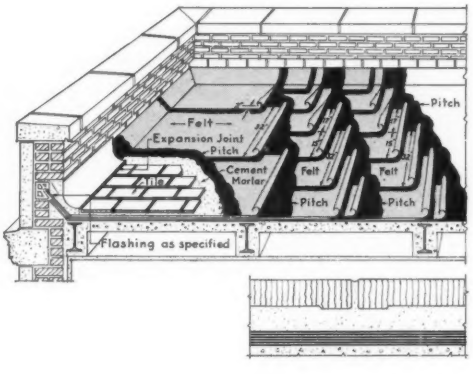
# DETAILS OF BUILT-UP ROOFING



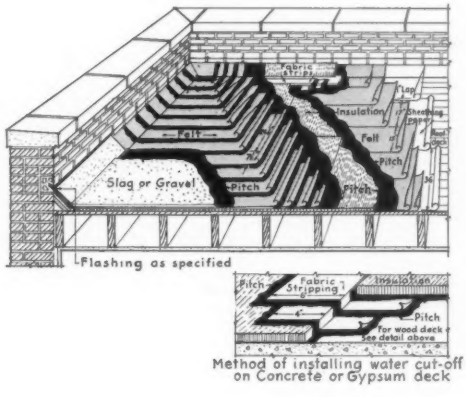

Flat Concrete Slab
Pitch not exceeding 2" in 1 foot




Precast Concrete Slab
Pitch not exceeding 1" in 1 foot

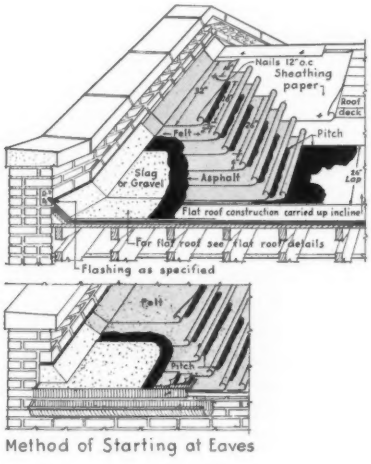



Promenade Tile Surface over Built-up Roofing
Pitch not exceeding 1" in 1 foot



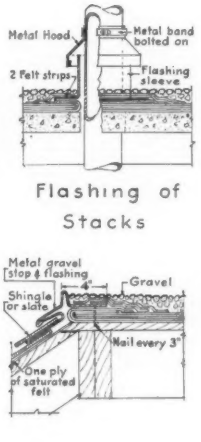

Method of installing water cut-off on Concrete or Gypsum deck

Wood Roof Deck with Rigid Board Insulation
(Similar for Precast Gypsum Roof Slabs)



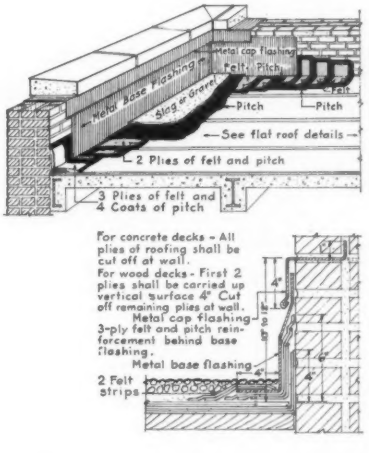

Method of Starting at Eaves

Sloping Wood Roof
Pitch not over 6" and not less than 2" in 1 foot




Flashing of Stacks

Gravel Stop at Change of Pitch




Typical Metal Flashing Detail
covering entire parapet wall surface

FIGURE 4

saturated felt. The felts themselves are made of mineral fibers, such as asbestos; vegetable fibers, such as cotton, cellulose, and prepared wood; and mixed fibers including rag felts. The standard weights are 15 lbs. per square (single weight) and 30 lbs. per square (double weight), but extra heavy felts are used for special purposes up to 60 lbs. Normally the dry felts are used to separate an unstable roof deck, such as one consisting of wood plank or precast cement or gypsum blocks, and the roof membrane above. The saturated felts are used according to the bituminous cementing material mopped on the roof; that is, asphalt saturated felts for asphalt roofs and coal-tar saturated felts for pitch roofs.

**Slag or gravel** must be used on bituminous roofings employing coal-tar pitch to protect it from the drawing action of the sun and to minimize its tendency to flow. A coating of 300 lbs. of mineral slag or 400 lbs. of gravel to 100 sq. ft. of area is normally required. Slag or gravel is also frequently used on asphalt roofs for similar purposes; but when a smooth roof surfacing is desired or when the slope will not permit the retention of a slag or gravel surfacing, the bitumen should be of an asphalt nature. Gravel or slag for roofing purposes should be of such size that it will all be retained on an ⅛ inch sieve and all passed by a ¾ inch sieve, with not less than 80% passing a ⅝ inch sieve and retained on a ¼ inch sieve, according to Federal specifications.

**Promenade tile and slate** are used as a top surface in place of slag or gravel where the roof deck is to be used as a promenade or recreation area. Quarry tile one inch thick and in squares 6″ x 6″ and 9″ x 9″, or in rectangles 6″ x 9″ are employed where a smooth surface is desired. Slate paving units ¼ to 1 inch thick and in rectangles from 6″ x 6″ to 8″ x 12″ usually give a more textured effect. Either type of promenade surfacing can be laid over an asphalt or a coal-tar pitch built-up roof, using bedding compounds as recommended by the roofing manufacturer.

**Construction** details are broadly indicated in Fig. 4. No attempt is made in these diagrammatic drawings to represent all details of construction but to point out the slight differences in treatment which exist in different kinds of roof decks and on roofs of varying pitch. As noted elsewhere the architect should adhere strictly to the detailed specifications of the manufacturer of the selected roof.

When rigid fiber insulation boards are laid over the roof deck precautions should always be taken to seal the insulation by means of saturated felt and bitumen from contact with masonry surfaces such as parapets or walls. A similar water cutoff should be installed as shown in Fig. 4, right center, to protect insulation laid at the end of each day's work so that at no time is a built-up roof installed over damp insulation boards. Always use a felt and bitumen seal course beneath such insulations.

**Durability** of built-up roofing is usually governed by the number of layers or plies of felt and asphalt or pitch, and by the quality of materials and workmanship. Bonds offered by roofing manufacturers are relative indications of the durability of the roof. It may be safely assumed that the bond does not measure the maximum life of the roof but demands strict adherence to specifications that are based upon experience. For all practical purposes the use of suitable materials and proper workmanship in accordance with the manufacturer's specification will produce a roof having a life well in excess of the term of the bond offered.

**Copper-clad built-up roofing** is a comparatively new development. The materials used are usually a base of asphalt saturated felt and two or three layers of 2-oz. copper mopped between layers of hot asphalt and surfaced with a finish coating of hot mopped asphalt. Another variation employs 2-oz. copper bonded to a 15-lb. asphalt saturated asbestos felt.

### OTHER SHEET ROOFINGS

**Prepared roll roofings,** sometimes called roll roofings, are made of three or more plies of felt saturated with asphalt or tar. Some are "smooth top," others surfaced with mineral granules like asphalt shingles. Tests at the Iowa State College indicate an average life for these roofings of ten years on roofs facing the south and 13½ years on roofs facing the north. They are chiefly used in architectural work for low pitched roof decks of limited area, in rural and remote suburban areas where it is impracticable to provide the asphalt or pitch melting and handling equipment required in the assembly of built-up composition roofs.

**Canvas** is sometimes used on low pitched roofs of small area and wood construction where more or less traffic is encountered that would injure a soldered sheet metal roof. Such conditions are commonly found on porch roofs in residences. Specially prepared canvas, which is available in several weights from light to extra heavy, is embedded in a thick lead and oil paste over a smoothly finished matched and tongued wood deck, and tacked with copper or heavy galvanized tacks along the lapped seams. Canvas is then painted with lead and oil paint, finished with a heavy top coat of yacht deck paint.

## FLASHINGS

THE weather-tightness of any roof depends quite as much upon the correct design and installation of flashings as upon the construction of the main roof surface.

**Copper** is the preferred flashing metal for all roofs except those of other metals where the roofing metal should also be used for flashings. Minimum weight should be 16 oz. R. T.; for better work use 18 or 20 oz. and for under flashings of Mission tile or where there is a fall of water that might erode the copper, use 24 oz.



XUM

**Zinc** may be used in place of copper for all roofings except wood shingles. It should be laid over neutral saturated felts, held in place with clips rather than nails, and set in reglets with elastic cement. Use No. 11 zinc gauge or heavier.

**Lead** may be used with any roof, but usually is employed only on the most enduring roofs such as sheet lead, slate or clay tile. Use hard lead of 2½ or 3 lbs. weight.

**Tin** or **Terne-plate** may be used on low-cost work but is unsuited for long life roofs unless it can be repainted every three to five years. The base metal for flashings should be IX thickness (approximately 28 gauge U.S.S.), **heavily coated.**

**Aluminum** flashings are used with aluminum sheet metal or pressed shingle roofs according to manufacturers' detailed recommendations.

**Bituminous** flashings made of impregnated woven fabrics or felts or of construction similar to the roofing itself, are often used with built-up roofings. Unless extended into flashing blocks in masonry walls, cap flashings of copper are to be preferred over counter-flashings that depend upon asphaltic cements and roofing compounds for their permanent weather resistance. Always follow roofing manufacturers' recommendations.

Methods of installing flashings are well established in the roofing trade and need little detailing here. Typical methods of using flashings on unit roofings are shown in Figs. 2 and 3. In specifying flashings these points should be considered.

Install flashings at all intersections formed by the roof with vertical surfaces, at all changes of pitch (valleys, hips, ridges) unless the roofing be of continuous sheet type, wherever stacks, chimneys or other structures penetrate the roof, at the eaves, and at all points where water, snow or ice may collect and work under the joints formed by the roofing units.

Provide for expansion and contraction at all junctions of dissimilar constructions by means of cap flashings overlaying (but not fastened to) base flashings, and by means of suitable slip joints where the expansion and contraction of the metalwork develops appreciable movement, as in long valley flashings and where eave flashings join gutters.

Carry flashings under unit roofings in valleys and at eaves beyond the area in which any water, snow or ice may collect. Increase the size of flashings beyond standard practice whenever conditions may cause excessive accumulations of snow or ice.

In valleys formed by slopes of unequal pitch or height, where the water shed by one slope may develop greater velocity or volume than from the other, install a crimp, batten or other equivalent projection in the valley to act as a baffle that will prevent the heavier flow from washing beyond the flashed area on the flatter or shorter slope.

Never permit nailing through metal flashings except on sheet flashings in closed valleys and on ridges and hips where the nails are covered by the flashing above. In valleys and at eaves where large metal flashings are employed attach by means of cleats to permit movement.

Wherever flashings join masonry they should be carried into reglets cut into the masonry or its joints and caulked in place with lead or caulking compounds.

**TABLE 5 — RAINFALL INTENSITIES AND DRAINAGE CAPACITIES OF LEADERS**

| | (A) Storms Which Should Be Exceeded Only Once in 5 Years | | (B) Storms Which Should Be Exceeded Only Once in 10 Years | | (C) Maximum Recorded Storms | |
|---|---|---|---|---|---|---|
| | Intensity in Ins./Hr. Lasting 5 Minutes | Sq. Ft. of Actual Roof Drained Per Sq. In. of Leader Area | Intensity in Ins./Hr. Lasting 5 Minutes | Sq. Ft. of Actual Roof Drained Per Sq. In. of Leader Area | Intensity in Ins./Hr. Lasting 5 Minutes | Sq. Ft. of Actual Roof Drained Per Sq. In. of Leader |
| Albany | 6 | 200 | 7 | 175 | 7 | 175 |
| Atlanta | 7 | 175 | 7 | 175 | 9 | 130 |
| Boston | 5 | 240 | 6 | 200 | 7 | 175 |
| Buffalo | 5 | 240 | 5 | 240 | 10 | 120 |
| Chicago | 6 | 200 | 7 | 175 | 7 | 175 |
| Detroit | 6 | 200 | 6 | 200 | 7 | 175 |
| Duluth | 5 | 240 | 6 | 200 | 7 | 175 |
| Kansas City | 7 | 175 | 8 | 150 | 10 | 120 |
| Knoxville | 5 | 240 | 6 | 200 | 6 | 200 |
| Louisville | 6 | 200 | 7 | 175 | 8 | 150 |
| Memphis | 5 | 240 | 6 | 200 | 10 | 120 |
| Montgomery | 7 | 175 | 7 | 175 | 7 | 175 |
| New Orleans | 7 | 175 | 7 | 175 | 8 | 150 |
| New York | 6 | 200 | 8 | 150 | 9 | 130 |
| Norfolk | 6 | 200 | 7 | 175 | 8 | 150 |
| Philadelphia | 6 | 200 | 7 | 175 | 8 | 150 |
| Pittsburgh | 6 | 200 | 6 | 200 | 7 | 175 |
| St. Louis | 6 | 200 | 8 | 150 | 11 | 110 |
| St. Paul | 6 | 200 | 6 | 200 | 8 | 150 |
| San Francisco | 2 | 600 | 2 | 600 | 3 | 400 |
| Savannah | 6 | 200 | 7 | 175 | 8 | 150 |
| Seattle | 2 | 600 | 2 | 600 | 2 | 600 |
| Washington | 6 | 200 | 7 | 175 | 8 | 150 |

FROM COPPER AND BRASS RESEARCH ASSOCIATION

**TABLE 6. DIMENSIONS OF STANDARD ROOF LEADERS**

| Type | Area in Sq. In. | Leader Size |
|---|---|---|
| Plain Round | 7.07 | 3″ |
| | 12.57 | 4″ |
| | 19.63 | 5″ |
| | 28.27 | 6″ |
| Corrugated Round | 5.94 | 3″ |
| | 11.04 | 4″ |
| | 17.72 | 5″ |
| | 25.97 | 6″ |
| Polygon Octagonal | 6.36 | 3″ |
| | 11.30 | 4″ |
| | 17.65 | 5″ |
| | 25.40 | 6″ |
| Square Corrugated | 3.80 | 1¾″ x 2¼″ (2″) |
| | 7.73 | 2⅜″ x 3¼″ (3″) |
| | 11.70 | 2¾″ x 4¼″ (4″) |
| | 18.75 | 3¾″ x 5″ (5″) |
| Plain Rectangular | 3.94 | 1¾″ x 2¼″ |
| | 6.00 | 2″ x 3″ |
| | 8.00 | 2″ x 4″ |
| | 12.00 | 3″ x 4″ |
| | 20.00 | 4″ x 5″ |
| | 24.00 | 4″ x 6″ |

FROM COPPER AND BRASS RESEARCH ASSOCIATION

## ROOF DRAINAGE

WHILE rainfall records showing the maximum intensity in inches per hour lasting five minutes are the basis for computing gutter and leader (or conductor) sizes for projects of major importance, experience has shown the adequacy of certain short-cut rules for designing these important roof elements.

**Leaders** should be not less than 3 inches round or 1¾" x 2¼" rectangular, except for small porches. Their area should be constant throughout their length and they should not be spaced over 75 feet apart. In small building work they should be placed near corners to avoid forcing water to flow far beyond a sharp turn.

Compute the areas tributary to each leader using the actual roof area rather than the plan area. Data given in the last column of Table 1 will assist in computing roof area from plan when pitch is known. From Table 5 take the factor indicating the "square feet of actual roof drained per square inch of leader area" for the conditions indicated in the nearest city. When an overflow may be permitted once in five years, use Column A. When a ten-year interval is acceptable use Column B. On roofs where overflow is to be avoided under any circumstance, use the maximum recorded storms in Column C. Divide the roof areas tributary to each leader by the factor thus found to determine the required areas of the leaders.

The actual leader size to be used will then be found in Table 6.

**Gutters** should have a minimum depth equal to one-half their width and a maximum depth not exceeding ¾ of the width. With this general proportion the width is the deciding factor in proportioning gutter size. Half round gutters are most economical and are properly proportioned. Other shapes should approximate their profile so far as possible, and in no case should be so steep sided as to be injured by the formation of ice.

Where the spacing of leaders is 50 feet or less, use a gutter of the same size if the leader be not less than 4 inches. For leader spacings exceeding 50 feet make the gutter width one inch wider than the leader diameter for every 20 feet or less of additional spacing on peaked roofs and for every 30 feet of additional gutter lengths for flat roofs.

## INSULATION

ALL roofs should be insulated, with rare exceptions found in certain types of industrial plants. The roof area of most buildings is responsible for the greatest heat loss in the winter and for a large part of solar heat load in summer. Ordinary roof construction has less insulating value than any of the common side-wall constructions. Wood shingles alone of all roofing materials have an appreciable insulating value, especially if laid on tight sheathing, but this value is quite inadequate for satisfactory fuel economy in winter or comfort in summer.

There is an impression among some designers that slate is not a satisfactory roofing in southern climates because of the high heat absorption of stone. Slate has about the same conductivity as concrete, and if used without insulation or ventilation would prove troublesome in hot climates. But all roofs should be insulated with other materials than the roofing surfaces. The difference in the amount of insulation required with various mineral roofing materials to afford the same protection against heat transfer is not often an important factor.

Normally insulation should be placed above the roof deck on flat roofs of all types and below the roof deck, either between or below the rafters, on all sloping roof construction employing unit roofing materials. The reason for this is that all insulating materials must be kept dry, else they will lose all value and prove harmful. Adequate protection is not practical under unit roofings. Built-up membrane roofs afford this protection if properly laid. Above-deck insulation, thoroughly waterproofed at all points, prevents solar heat from reaching a heavy masonry roof so that the mass will not continually radiate heat within the structure during a protracted period of warm weather. For complete data on the selection, use and comparative value of insulating materials, see AMERICAN ARCHITECT Reference Data No. 11, "Thermal Insulation of Buildings," May, 1934.

## VENTILATION OF ROOFS

REGARDLESS of the amount of insulation employed there is always a certain amount of heat transfer through the structure, insulation merely retarding the rate of flow rather than preventing it entirely. Hence any roof, insulated or otherwise, will heat up on warm, sunny days and radiate part of that heat to the space beneath the roof deck. The roof temperature may rise to as much as 140F during the daytime, creating a temperature head of 60 or 70F above that desired indoors. Part of this heat will be transferred indoors. At night the outdoor temperature and the roof surface may drop to 70F or less, but if the attic space has been warmed to 85 to 90F there is only a 10 to 20 degree temperature head between the indoor and outdoor surfaces which is insufficient to cool the attic space as rapidly as it heated.

Failure to appreciate this fact has led to many disappointments in the insulation of attic spaces, particularly in residences. The solution of the problem is always to provide ventilation for attic areas so that the increased temperature developed from solar heat can be quickly dissipated by the cooler night air. This ventilation may be effected by means of louvers, ventilators, false chimneys or continuous ridge ventilators shaped like ridge rolls or caps.

# ETERNIT TIMBERTEX

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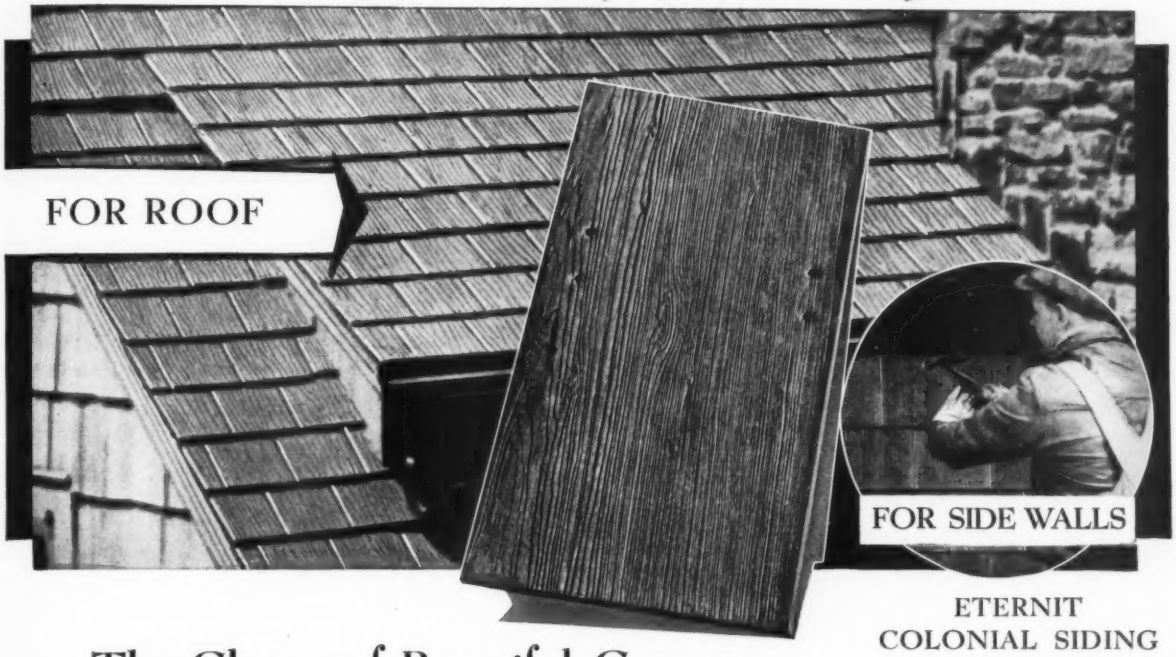


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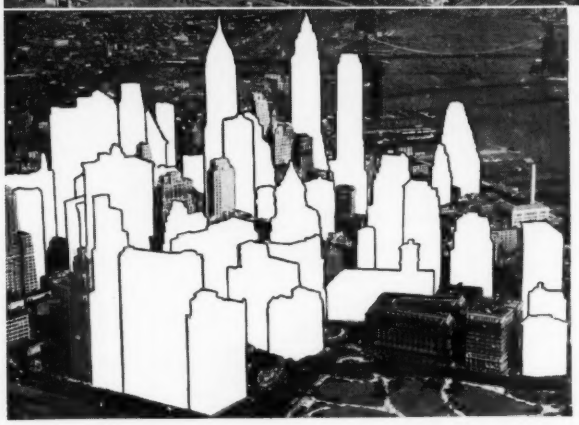

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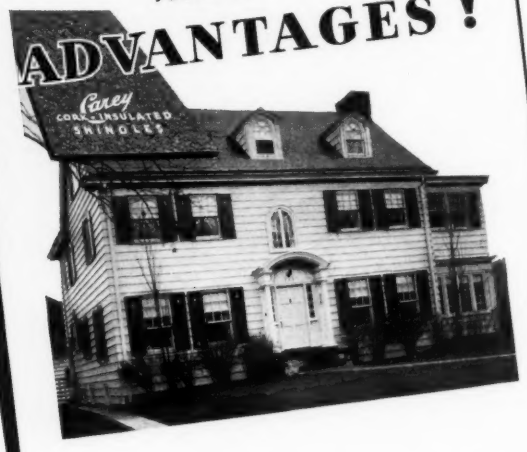


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**Carey**
**CORK-INSULATED SHINGLES**

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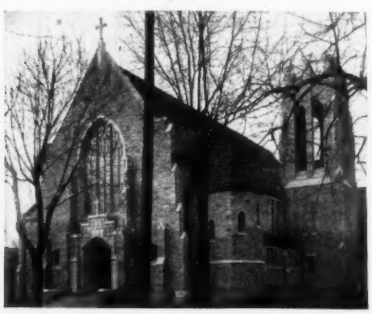
*St. Pascal's Church, Chicago. Architect: B. J. Hotton. Associate: Raymond Gregori.*



*Grace Evangelical Church, Oshkosh, Wisc. Architect: H. C. Haenser.*

*St. Paul's Lutheran Church, Milwaukee. Architect: Hugo Logemann.*

*Cathedral of Assumption, Louisville, Ky. Architect: D. X. Murphy and Bros.*

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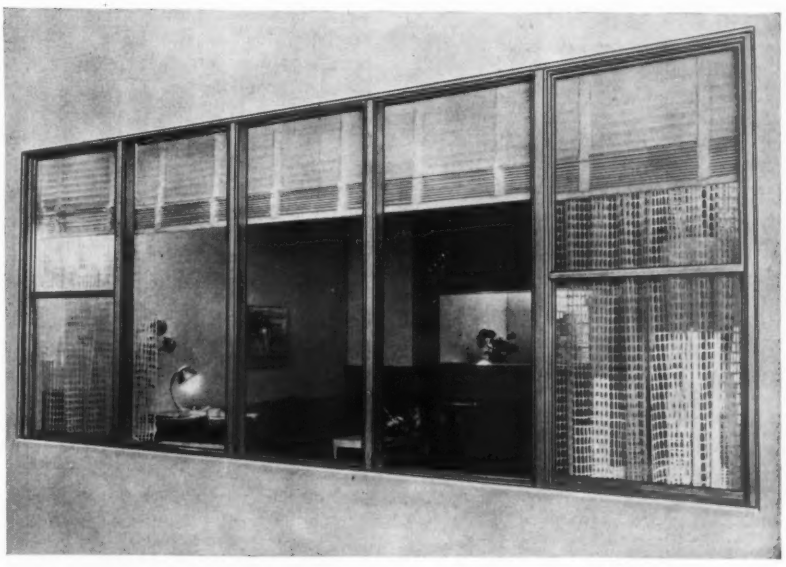

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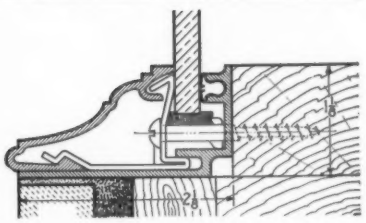
**402M** A new type of moisture-resisting plywood especially adapted for outdoor uses is announced by Harbor Plywood Corporation, Hoquiam, Washington. Panels are fabricated under exclusive processes using a resin glue which is applied dry between alternate plies of wood. Each panel is hot-pressed individually between large heated plates in a press which takes panels up to 102 inches wide and any length required. Exposure and boiling tests indicate this new plywood can be used indefinitely for outdoor purposes, especially for concrete forms, with no separation of plies and without warping.

## Water Circulators and Flow Valves

**403M** Minneapolis-Honeywell Regulator Company, Minneapolis, announces a new line of water circulators and flow valves for use in hot water systems where gravity flow leaves certain radiators cold, where radiators on ends of mains fail to heat equally with those nearer boiler, or where pipe sizes are too small. The water circulators are made for 1½", 2" and 3" pipe sizes and use brushless type motors which supply high torque without heavy momentary line load. The impellers are designed for maximum pumping capacity with minimum power at the motor. Flow valves for use with circulators or in Summer-Winter hot water supply systems eliminate the need of ordinary check valves. They are of the 45° swinging disc type, permitting installation in either horizontal or vertical position. The valves are manually operated but may have motor power units.

## Corwith Cabinet Lavatory

**404M** Extra storage space in bathrooms is now made available by the Corwith Cabinet Lavatory, illustrated above, a new product of the Crane Company, Chicago. This enameled iron lavatory can be furnished in white or color, has a deep-sized basin, large cabinet space, a handy towel bar alongside, and a raised spout to prevent back-siphonage. It also has a recessed base to provide adequate foot room. All trimmings are chromium plated. This compact unit measures 24" x 20" and its installation will overcome the necessity for using space elsewhere for storage of articles required daily in the bathroom. Home owners will value its space-saving features and compactness.

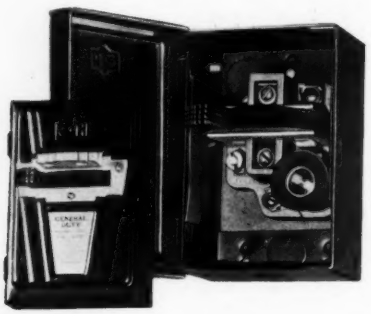


## Pittco Store Front Construction

**405M** A new type of metal store front construction which combines Pittco store front metal work with Carrara structural glass, has been created by Pittsburgh Plate Glass Company, Pittsburgh. The sash is furnished in Alumilite—a hard finish that is an integral part of the aluminum metal—and provides a double yielding cushion-grip on the glass. Rear members and plate glass can be set before outer members of sash and Carrara are applied. All exposed members are formed by extruded process. Other features include: nonferrous metal supporting blocks are firmly wedged in a groove which prevents tipping during setting of glass; metal cleats secure miters against rising, falling or spreading; glass holding units and face members are self-adjusting to various glass thicknesses; both glass and sash are set from outside by standard wood or machine screws and screw-driver. Sash may also be obtained in architectural bronze in satin or polished finish with wax protection, and may be provided with means for drainage when desired.

## Extruded Hollow Shapes

**406M** Hollow metal architectural members can now be extruded on a protection basis, without welds, seams or dovetails, by a new process developed by Bohn Aluminum & Brass Corporation, Detroit. The Bohn extrusion process assures uniform concentric wall thicknesses, and the use of Bohnalite and Bohnolloy metals reduces danger of splitting due to internal stresses. A wide variety of these integrally extruded shapes is rapidly developing.



## Safety Switch

**407M** A new 30-ampere safety switch has been introduced by Cutler-Hammer, Inc., Milwaukee, which is adapted to oil burners and domestic stokers in basement recreation rooms, to air conditioning equipment, electric unit heaters, as entrance switches, etc. Compact in size, measuring 3½ x 5½ x 3½", the new unit has ample wiring space to simplify installation. The toggle mechanism, front operated, is double pole and the switch is of the fusible type. The operating lever is made of arc resisting laminated horn fibre with provision for padlocking in either open or closed position. Finished in black baked enamel with cadmium trim.

## Asbestos Siding Shingles

**408M** A new type of siding, known as Cedarstyle, has been added to the line of Johns-Manville (New York) Asbestos Siding Shingles. The surface of the siding is a reproduction of the wood grain effect of old cedar shingles. It combines the charm of weathered wood shingles with the permanency and fire-resistant qualities of asbestos.

## Globe and Angle Valves

**409M** A new line of renewable bronze angle and globe valves is announced by The Fairbanks Company, New York. The radial seat, between body and bonnet, is drawn to a tight joint by the union nut without sliding or scraping the surface of the seat. The disc ring is composed of long-fibre asbestos compounded with vulcanizing elements and has a standard sized disc holder. The stem is of rolled rod bronze, averaging 65,000 lbs. tensile strength. The union nut is of heavy bronze with large hexes and the handwheel is of malleable iron. All parts of globe and angle valves are interchangeable.

## Guth "Super Indirect" Lighting Unit

**410M** A new development in indirect lighting is the Guth "Super Indirect" unit recently introduced by The Edwin F. Guth Company, St. Louis. The unit has a scientifically-shaped reflector, made of porcelain enameled steel and finished in ivory and white, with chromium stem. It is 18 inches in diameter and will accommodate lamp sizes from 300 to 1,500 watts. The "Lumo-Vitro" reflecting surfaces plus the design of the reflector bowl is said to account for the efficiency of the unit.


## Weatherproof Safety Switch

**411M** A new line of weatherproof, dust-tight Type A Safety Switches in standard sizes from 30 to 600 amperes capacity, is now offered by The Electric Controller & Mfg. Company, Cleveland, Ohio. These EC&M Weatherproof Safety Switches are equipped with fully interlocked door, making it impossible to operate the switch with door open, or to open the door with switch closed. They are enclosed in a 10 gauge steel cabinet which has been rustproofed before the enamel is applied. A heavy sponge rubber gasket makes a tight seal between door and cabinet.

## Klearway Cleaning Valve

**412M** Excelso Products Corporation, Buffalo, New York, has announced a new design of the Klearway Cleaning Valve—a valve which is installed to remove sediment from heater, tank and piping in domestic hot water supply systems. By turning the handle of the valve to either of the two cleaning positions indicated on the dial, one-half of the system is flushed out under pressure, while the opposite side is closed off. By reversing the operation the opposite side of the system is likewise cleaned. It is supplied with a brushed brass body with chrome-plated handle and cam, and has an adjustable stem.

## Perspective Lined Sketch Paper

**413M** The Wade Instrument Company, Cleveland, Ohio, has developed a new lined sketch paper with which perspectives of almost any subject can be drawn, using a 12" straightedge. It consists of a transparent square prism design, each edge of which is graduated 1", ½" and ¼" in perspective. Sketches may be made to any scale, direct from the subject, and any point on or in the prism may be accurately located. Sheets are available in two sizes: 8 x 13" and 13 x 16".

## G-E Dish-Glasswasher

**414M** A new dish-glasswasher for commercial use has been announced by the General Electric Company, Nela Park, Cleveland. The new unit applies the dishwasher principle in the washing of glassware. It can be installed as a part of existing work surfaces or as a separate unit by the addition of a base-type, all-steel cabinet. It has a ⅓ hp. motor and three knobs for the manual control of the water valve, drain valve and motor contact. All metal trays are available in combinations for glasswashing, dishwashing or dish-glasswashing.

# THERE'S A NEW AND FERTILE FIELD FOR ARCHITECTS

## ...among owners of multi-parcel property

• *It's good business* for property maintenance officials to modernize their out-of-date houses—to make them easy-to-rent, easy-to-sell.

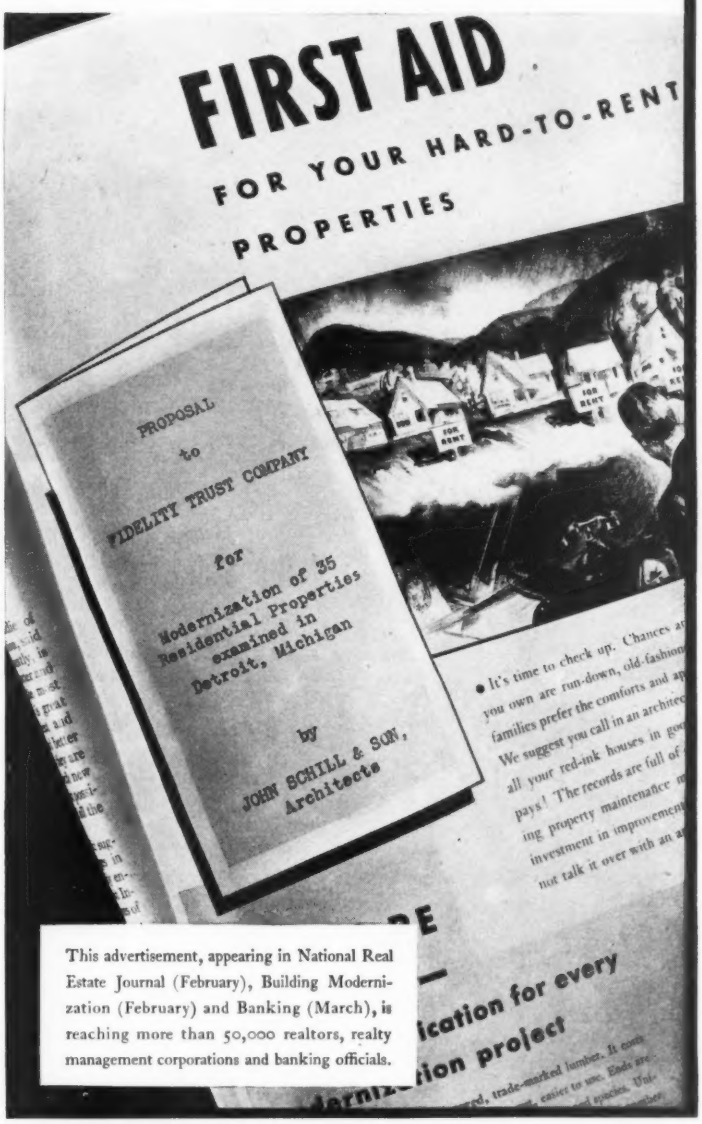
It's good business for architects, too, to offer their facilities for this kind of work. A number of eastern firms are specializing in modernization—and making money for the first time in years. Have you checked the possibilities in your own city?

### 4-SQUARE LUMBER

### ...a safe specification for every modernizing job

• 4-SQUARE Lumber is improved, trade-marked lumber. It costs no more because every piece is precision cut, easier to use. Ends are smooth and square. Available in all principal softwood species. Uniform size standards are followed both as to width and thickness. Architects who have had experience with 4-SQUARE Lumber are enthusiastically specifying it for both building and repair work. 4-SQUARE Lumber is sold by almost 3000 dealers from coast to coast. See the dealer nearest you. He has some original material that will prove valuable to you in planning all kinds of residential modernizing work.

WE COOPERATE WITH BETTER HOUSING PROGRAM




This advertisement, appearing in National Real Estate Journal (February), Building Modernization (February) and Banking (March), is reaching more than 50,000 realtors, realty management corporations and banking officials.

**WEYERHAEUSER SALES COMPANY**

WEYERHAEUSER 4-SQUARE LUMBER

FIRST NATIONAL BANK BUILDING SAINT PAUL, MINNESOTA

# GENERAL ELECTRIC "HOME

## *to design a home*

The Bliss family for which small homes in Classes A and B are to be designed.

## $21,000 IN PRIZES

THERE is still time to enter the $21,000 G-E Architectural Competition. But the time is growing shorter. Competition closes at midnight on March 12, 1935.

The purpose of this competition is to encourage better designed homes from the standpoint of health, comfort, convenience and home entertainment—utilizing the latest mechanical and electrical advances.

Exterior design will, of course, be a factor in awarding prizes in this competition, but the judges will give greater weight to the skill and ingenuity with which the architect has provided for the maximum health, comfort, convenience and entertainment of the family for which the house is planned. This family is described in detail in the Contest Rules sent to each competitor.

Any architect, engineer, draftsman or designer, except G-E employees, is eligible to compete. Announcement of prize winners will be made on March 23rd. The jury of award consists of eleven members—seven architects representing different sections of the United States, one expert in child training, one home economics expert, one general contractor and one realtor. Names of jurors will be announced on March 19th, the first day of the judging.

Prize winning designs will be published, together with the report of the jury of award.

*Member, Producers Council, Inc.*

**GENERAL ELECTRIC**

# ELECTRIC" COMPETITION

## *for the Bliss family*

The Bliss family for which the medium size homes in Classes C and D are to be designed.

## 54 PRIZES IN ALL

| | | |
|---|---|---|
| GRAND PRIZE for Best Small Home (Best Home in Classes A and B) | | $2500. |
| GRAND PRIZE for Best Medium Size Home (Best Home in Classes C and D) | | 2500. |
| FIRST PRIZE for Best Small Home in Class not receiving Grand Prize | | 1500. |
| FIRST PRIZE for Best Medium Size Home in Class not receiving Grand Prize | | 1500. |
| SECOND PRIZE, in each of the four classifications | $1250. | 5000. |
| THIRD PRIZE, in each of the four classifications | 1000. | 4000. |
| HONORABLE MENTION, ten in each of the four classifications | 100. | 4000. |
| | Total | $21,000 |

## FREE!

A handy reference file of architectural data on all G-E products used in home construction or equipment. The coupon below will bring you the complete program and the File. Fill it out and mail today.


## COMPANY

Professional Advisor
G-E Architectural Competition
General Electric Company, Room 1208
570 Lexington Avenue, New York, N. Y.

GENTLEMEN: I desire to enter the G-E Architectural Competition for more livable homes. Please send me full information and the handy G-E Reference File.

*Name*.....
(PRINT)

*Address*.....

.....

*Business Connection*.....

.....

# The Readers Have a Word to Say

## • SUBCONTRACT METHOD IS THE ANSWER

*Editor,* AMERICAN ARCHITECT:

HOW are the architects going to meet the vast potentialities of Title II of the National Housing Act, I mean the rank and file?

Will they take a leading part by establishing their economic ability to conserve the interests of so large a clientele? Will they obtain the best the market affords for them, or will they, as usual, leave the cost problems to the so-called general contractor?

Are they ever going to realize that this man is cleverly relieving them of their perogatives and that there is no room for both in this class of work? Besides, the expense is more than the traffic will bear.

Whenever the architect lets a job on the lump-sum basis he belittles his importance and in a measure loses control of the job. On the other hand, it makes the contractor the key man.

The good old system of segregating all branches of the work into separate contracts gives the architect complete mastery and saves the owner the margins that easily pay the architect's fee. And, what is more important, gives a better job at less cost.

It is through this means that good houses can be placed before the public in an ever-increasing number which will eventually establish more firmly the architect.

Any institution that discourages this thought or is indifferent to it, does not understand the mental attitude of the people in their conception of the architect and his services.—*H. J. Rotier, Architects Small House Builders, Inc., of the North Central Division, Inc., Milwaukee, Wis.*

## • RETAIL LUMBERMEN WANT TO HELP

*Editor,* AMERICAN ARCHITECT:

AFTER reading the December number of AMERICAN ARCHITECT and especially the "As It Looks to the Editor" page, I am accepting the invitation to write the editor and express my views on some things which I think confront the architectural profession. I am not an architect, but, having spent seven years in the retail lumber business, I feel that there are some things with which I am familiar that are of interest to architects interested in small houses.

I believe that we, the retail lumber dealers, have had plenty of experience in the small house field, some of it to our sorrow. Quite a few lumber dealers have tried to prepare plans and specifications, superintend construction, and in fact be the whole cheese, so to speak, on buildings of this type. Experience is a hard teacher and it has been learned that competitive bids on a project where some dealer has prepared the plans and specifications is never satisfactory.

The Texas Retail Lumber Association has sponsored a radio program to help sales and to help put before the public the FHA program. In each weekly broadcast emphasis is always placed on GETTING AN ARCHITECT to help plan and advise. If there were no small houses of which the plans, specifications, and so on, were drawn up by dealers, what a blessing it would be to the entire building industry.

There are few lumber dealers who do not try to persuade people, interested in building, to engage an architect. You will find that advice being given more in the offices of lumber dealers today than ever before. Yet we find that the prospect wants to sidestep the architect, simply because he has no knowledge whatever of his services. The layman is under the impression that the architect merely draws plans, collects a fee and turns the whole thing over to the client to work out to the best of his ability. That, I think, is one of the major problems of the architect today. In order to overcome it, the layman must be educated as to the duties of an architect; the many ways in which an architect protects the client; the numerous problems solved by the architect even on the smallest house. Then, and then only, will the public feel toward the architect as it should.

The public has been under the impression that it could not afford an architect; that an architect catered to the higher class of work. The ethics of the profession has kept the public ignorant of just what the architect means to him. I mean by that, that no architect uses the medium employed in every other business or profession; namely, advertising. I have been told that the ethics of the profession frown on this. I don't know, but if and when the public is educated as to what is meant by city planning and how it can best be applied toward helping to solve many of our existing problems, then we will find the architect brought into his own. Education is the fundamental problem that now confronts the architect and no one is more impressed with just what this will mean to both the layman and architect than the retail lumberman. If given the least bit of encouragement, the retail lumberman will do as much, if not more, than any other agency toward bringing about a better understanding between the public and architect during these next few years. It is to his advantage to do so.

In closing, I want to say that I enjoy and get more real good out of reading AMERICAN ARCHITECT than any other publication of its kind I have ever found. To me it is worth several times the subscription price. And I am never found without the current issue on my desk.—*Morris S. Cox, C. L. Wilkirson Lumber Co., Post, Texas.*

## • HOW CAN IT BE DONE?

*Editor,* AMERICAN ARCHITECT:

THIS company would like to look over as large a number as possible of attractive, small house plans from which it or its customers could select plans for construction. Our interest is chiefly in 3 to 7 room, small houses which could be built under prevailing prices for $4,000 to $7,000 complete including heating, plumbing and electric work. In case of selection, we would like to know that necessary construction plans would be available at nominal cost and what this cost would be.

Would you please advise if you are in a position to furnish us with a list, folio or cuts of such house plans, and what your charge would be to supply us with them. If you are unable to do so, can you suggest any agency who might help us in obtaining this data.—*P. W. Thomas, Engineer, Rumford Falls Realty Co., Rumford, Me.*

Neither American Architect or any of its affiliated magazines have plans for any type of building for sale. Mr. Thomas' letter does bring to our attention the importance of the profession's finding a sound solution of the problem his inquiry presents.—Ed.

## • WHO HAS DATA ON GOURDS?

*Editor,* AMERICAN ARCHITECT:

I AM writing a book, The Gourd: as Grown and Used in the United States. Two thirds of the book will be devoted to a study of the various uses of the gourd as found among our American Indians, our American

# A FINE OLD ART

*Printing*

+

# A FINE OLD FABRIC

*Mohair*

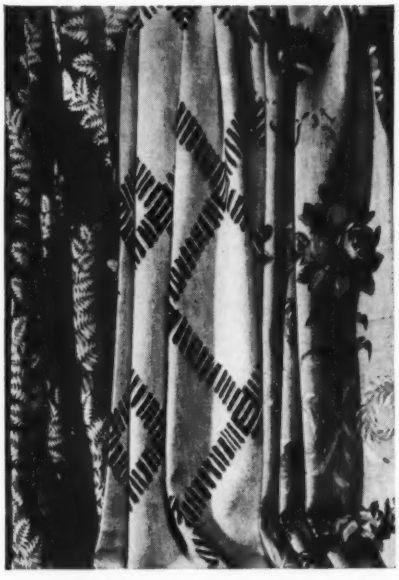
GIVES US THE NEW

# HAND-PRINTED MOHAIRS

It's 1935. Glass walls. Streamlined furniture. Hidden lighting. Not everybody is going to accept these modern innovations on the spot. But, the newest thing in the textile world . . . Goodall hand-printed mohairs . . . are welcome everywhere, because:

Everybody knows about the everlasting wear in a piece of fine mohair . . . how it sheds dust, resists wrinkling and shrinking, keeps its color and lives to a ripe, but not hoary, old age.

Everybody is going to find a pattern to suit a particular need. From country-house, wide-spread florals, to neat-patterned all-overs and frank modern designs . . . there's a new Goodall mohair print for each upholstery, slip-cover and drapery use.



Everybody is going to like the prices of these fine 50-inch prints. Architects, because of the prestige (as well as profit) in handling a quality product. Clients, because of the very slight difference in cost against ordinary, sleazy fabrics.

Practically all fine decorative jobbing houses have exclusive patterns in Goodall mohair prints, and sheer mohair casement fabric for use with them. Or, a Chase salesman will be glad to show the line, upon receipt of request.

## Goodall-Sanford

INDUSTRIES

GOODALL FLAT MOHAIRS
VELMO UPHOLSTERIES

SEAMLOC BROADLOOM CARPET
LEATHERWOVE COATED FABRIC

**L. C. CHASE & CO., Inc.,** *selling subsidiary of* Goodall-Sanford, **295 Fifth Ave., New York**

BOSTON • CHICAGO • DETROIT • LOS ANGELES • SAN FRANCISCO

Pioneers, and the Southern Negroes.

As illustrations for the section on the American Pioneer and the Southern Negro, I am anxious to get illustrations of old homesteads, cabins, plantation houses, etc. Pictures that show the view of a Southern cabin where gourd water-butts, gourd birdnests, gourd dippers, gourd flower stands, etc., are revealed, the fence of an old Southern Plantation along which gourd vines grow—any pictures that portray the American architecture of the humbler, quainter sort is what I am seeking.

As editor of a great magazine on architecture, you are, no doubt, familiar with all phases of the American scene. Could you refer me to books, publications, collections of pictures, etc. in which the buildings I have described are portrayed? I am specifically interested, of course, in pictures that reveal the gourd as part of the equipment of a house, whether in the garden, on the back porch, or inside the kitchen.

Names of people who are authorities on the equipment of the humble architecture of our country and to whom I might write asking for suggestions and bibliographies will be extremely appreciated. In short, any information you can give me on the uses of gourds in our American homes and architecture will aid me greatly in my researches.—*Mrs. J. W. Clancy, Los Angeles, Calif.*

## • THE EDITORS ARE CORRECTED

*Editor,* AMERICAN ARCHITECT:

MAY I express my sincere appreciation of Piaget's photographs of Old Mexico? Those reproductions are excellent and give some idea of the promise Mexico gives to her prospective sight-seer.

However, may I take the liberty of disagreeing with a portion of text on the title page? I feel that the Spanish conquest has not obliterated native civilization. The present-day Catholic religion in Mexico, which has had a tremendous influence there, has been spotted with much of the Indian lore of the past, the effects of which are felt even here in San Antonio among the Mexican population.—*J. Fred Buenz, San Antonio, Texas.*

## • TO ADVERTISE OR NOT TO ADVERTISE

*Editor,* AMERICAN ARCHITECT:

THE question has recently arisen as to whether it would be ethical for an architect to advertise in the trade publication, *The Monument and Cemetery Review.*

It would seem that an architect would have as much right to advertise his services as the contractor or any other of the many other firms whose services are used in building. Of course, ours is a specialized service and that might make a difference.

Will you please let us hear from you regarding this at your early convenience?—*C. R. Jamison, Secretary The Monument and Cemetery Review, Buffalo, N. Y.*

Whether or not it would be unethical to advertise in the manner suggested in the above letter would apparently hinge upon the character of the advertisement itself. Certainly it is not unethical to advertise. American Institute of Architects, Document No. 225, Article 6, states in part: "An architect will not advertise for the purpose of self-laudatory publicity." So far as the Institute is concerned, that would apparently be the determining factor in deciding whether or not the advertisement were ethical or unethical. The question would not be that of advertising in itself.—Ed.

## • A TIMELY STORY

*Editor,* AMERICAN ARCHITECT:

THE article "The Black Emperor's Capitol" by L. F. Pilcher is certainly a "knock out." It was opportunely presented to the profession, not only because it portrays what the human brain can conceive despite great handicaps, but the "spotlight" has been turned on those regions as being our next frontier. The cultural merit of this work is obvious to all.

Enclosed please find check covering one year's subscription tc AMERICAN ARCHITECT. I would like to have the September issue.—*Chester L. Wiseman, Assistant Professor of Architecture, Pennsylvania State College.*

The editors believe that articles dealing with the romance of architecture are enjoyed as a relief from prosaic aspects of business. They would like to know how many other readers have found articles similar to "The Black Emperor's Palace" of interest.—Ed.

## • TO THE GENERAL ELECTRIC COMPANY

Mr. T. K. Quinn, General Electric Co.,
570 Lexington Ave., New York City.

MY DEAR MR. QUINN:

I have recently received an announcement of the General Electric Company's American Home Radio program.

It occurs to me that this program offers a rare opportunity for the General Electric Co. to render a service to the architectural profession and the public.

If you have not already planned to do so, may I suggest that you include in the program some mention of the architect and the important service he renders in the planning and building of houses—large and small.

I believe the profession would appreciate this. It would tie in with the General Electric Architectural Competition now getting under way as well as with the F. H. A. program. There is precedent for the idea in the radio programs of both Johns-Manville and The American Rolling Mills.

If it would be helpful to you, our staff would be glad to prepare a short paragraph on the employment of an architect which could be incorporated in your announcer's copy.—*Benjamin F. Betts, Editor* AMERICAN ARCHITECT.

## • COMMENTS ON "WHEN YOU BUILD"

*Editor,* AMERICAN ARCHITECT:

PLEASE send us one copy of booklet "When You Build." We feel this is one of the first definite ideas to help secure new business we have seen lately. Congratulations to you for this bit of advertising. We younger men in the Architectural field feel the need of such ideas. The profession seems to be sadly lacking in contact methods that bring results.—*Paul B. Sweeney, Syracuse.*

*Editor,* AMERICAN ARCHITECT:

YOU are carrying on a splendid campaign in an effort to revive the building industry and especially the architect whose talent and service are essential to successful building.—*C. F. J. Barner, Architect, Detroit, Mich.*

*Editor,* AMERICAN ARCHITECT:

I HAVE at hand one of your excellently written and beautifully illustrated booklets entitled "When You Build." This is by far the finest thing of its kind ever brought to my attention. Can these booklets be obtained in large quantities. If so, what is the price?

Secondly, could permission be obtained to reprint parts or all of this in THE WISCONSIN ARCHITECT, which is the official publication of the State Ass'n of Wisconsin Architects?

We expect to have an executive board meeting early in November and if possible, I would greatly appreciate your answers to the above questions before that time, so that they could be discussed with the board.—*Theodore L. Eschweiler, President, The State Association of Wisconsin Architects, Milwaukee, Wis.*

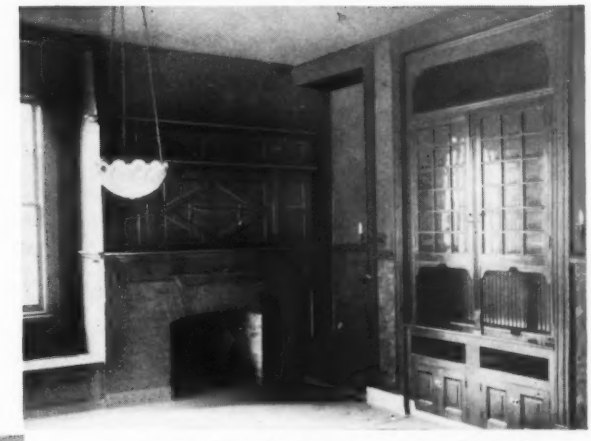
*Editor,* AMERICAN ARCHITECT:

WE are enclosing our check for fifteen copies of your publication "When You Build."

Please accept the compliments of our firm for the splendid manner in which this publication has been put out.

The booklet should be of great help to every architect in the United States, and our only regret is that we have not fifty prospects at the present time to whom we could send a copy of your booklet.—*Magney & Tusler, Inc., Architects and Engineers, Minneapolis, Minn.*

# Enter the ARCHITECT!



A relic of the Gay Nineties as it was "before"

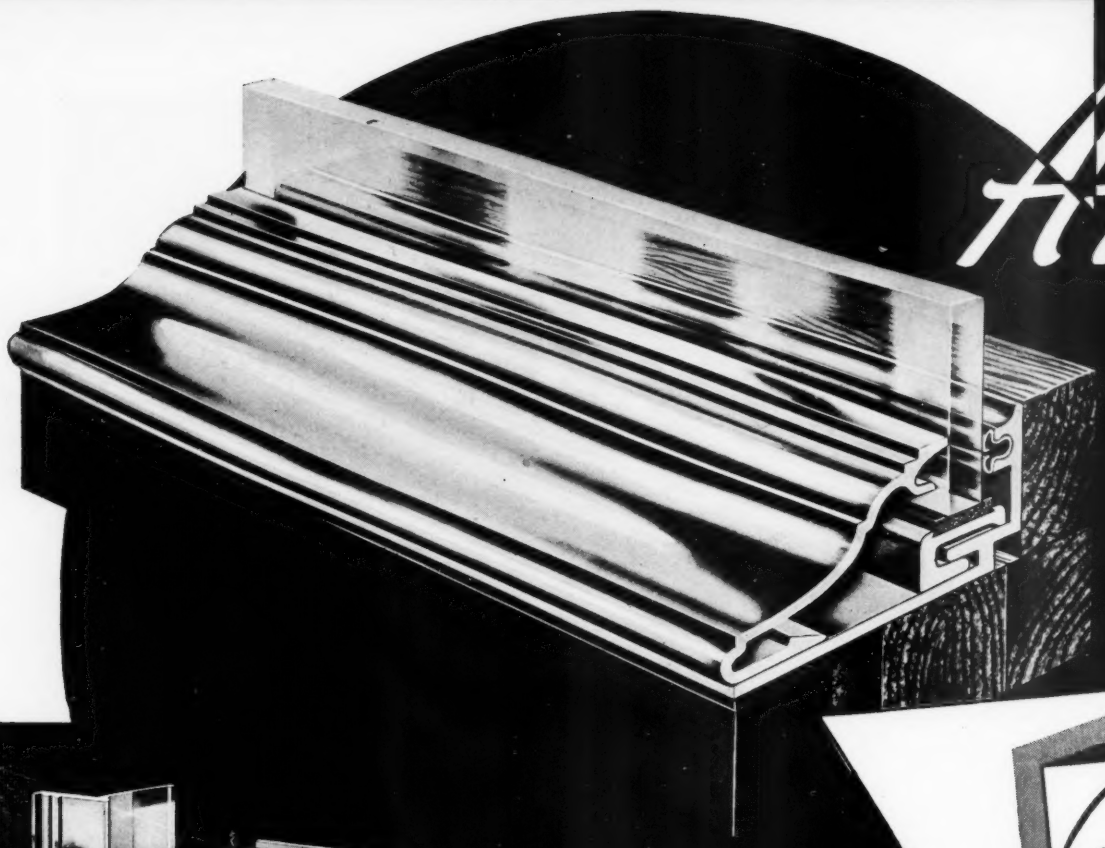
Elimination and simplification wrought the "after" above

**The photographs reproduced here are typical of what can be done by the skilled hand of the architect. They are illustrations from an article on remodeling appearing in February Good Housekeeping.**

**Every month through its building and remodeling articles, Good Housekeeping stresses to its 2,000,000 readers the importance of the architect to the success of their building or remodeling plans.**

# Good Housekeeping

*Everywoman's Magazine*



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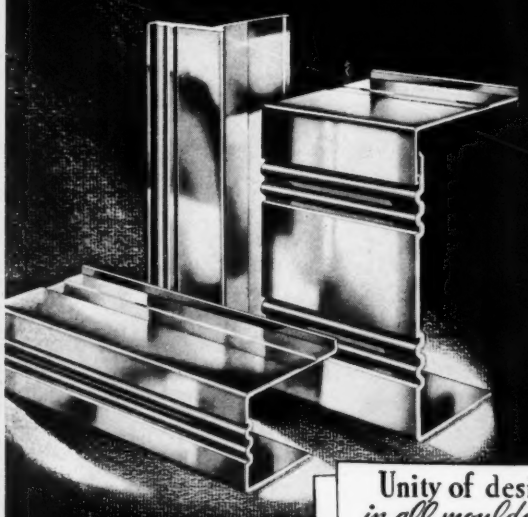
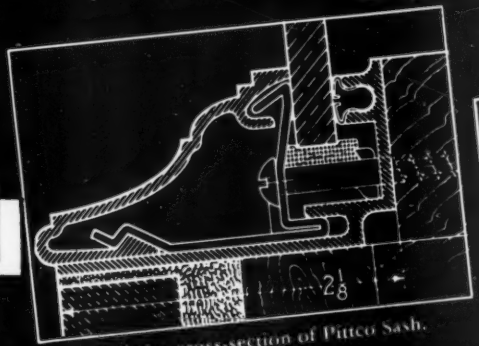
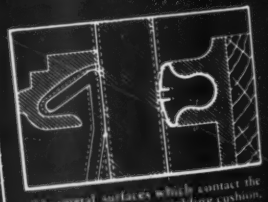


## Unity of design *in all mouldings*

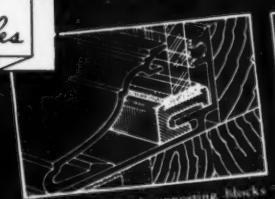


Full size cross-section of Pittco Sash.

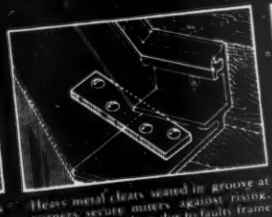


The metal surfaces which contact the sides of glass act as a yielding cushion, absorbing dangerous shocks and jars.

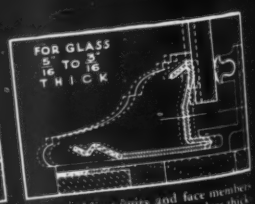
## Trim Vertical Bars *adjustable to all angles*



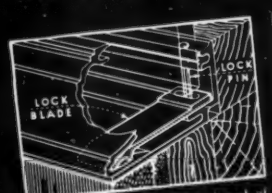
Non-ferrous metal supporting blocks are firmly wedged in groove, thus preventing tipping, rocking or sliding out of line during setting of glass.



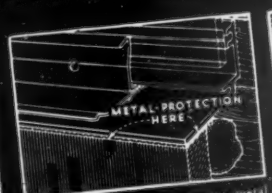
Heavy metal cleats seated in groove at corners secure mitres against rising, falling or spreading due to faulty frame work.



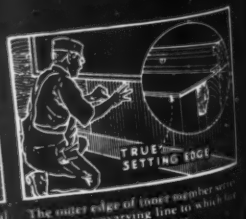

Glass-holding fins and face members are self-adjusting to various glass thicknesses without tilting inward or outward.




A metal blade inserted in each end of face and locked by pin to rear member is an extra means of securing face in position.




A sturdy square-cut continuous metal flange projects over edge of facing material, shielding the area which is most vulnerable.




The outer edge of inner member serves as a true, unvarying line to which face of structural material is set.

# Announcement

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ALLIED ARTS

# BOOKS

ENGINEERING
BUSINESS


Left, illustration of off-set reproduction from "Artwork: How Produced. How Reproduced." Right, plate illustration from "Modern Housing"

## MODERN HOUSING

By Catherine Bauer. Published by Houghton Mifflin Company, New York. Illustrated; indexed; 331 pages, 48 plates; size 6¼ x 9½; price $5.00

IN effect this book is merely an extensive and detailed definition of its title. Modern housing has been the subject of much twisted thinking and garbled expression; and in treating of it Miss Bauer has taken infinite pains to clarify statements of actions and reactions. The volume developed as one result of the author's travelling study of modern housing in Europe. It deals primarily of foreign housing schemes. But they are studied in the light of their possible adaptability in solving the housing problems of our own land. Hence, to the architect who is concerned with these, the book will prove an absorbing and critical analysis of a great deal of important material. Miss Bauer has made no attempt to become highly technical in her examination of modern housing. Beyond a number of plan diagrams and a series of illustrative plates little attention is paid to details. But the generalities cover a broad territory. They are pointed and comparative; and in her manner of attacking them Miss Bauer shows herself an able and energetic proselyte for the most avid subject of the contemporary hour.

The text is divided into four general headings. The first sketches the background of failure that has brought the housing problem into being as such. The second deals with past, abortive attempts to improve the situation in all countries. The third part notes the facts and figures of post-war housing; and the remaining section considers the various elements that make up the physical plant of modern housing.

## ARTWORK: HOW PRODUCED, HOW REPRODUCED

By John Petrina. Published by Pitman, New York. Illustrated; indexed; 122 pages; size 9¾ x 12¼; price $5.00

TO anyone—architect or layman—who has wondered about the technicalities involved in the production and reproduction of artwork this book will prove invaluable. Mr. Petrina, an artist of wide versatility and now a member of the faculty of the School of Fine and Applied Arts, Pratt Institute, has accomplished almost the impossible in this volume. Both drawings and descriptive text are his work. These range from examples of simple pencil drawings to the complications of etching and lithography. Under each heading is included a discussion of materials involved or recommended and a generous number of excellently presented illustrations, many of them in full color. Particularly useful to the tyro is a simple explanation of photo-engraving processes and a glossary of terms involved.

## BOOK OF THE SCHOOL

By The Architectural Alumni Society. Published by University of Pennsylvania Press, Philadelphia. Illustrated; 213 pages; size 7¾ x 10¼; price $3.00

PRIMARILY this book is a report of the policies, progress and historical background of the Architectural School of the University of Pennsylvania. As such it might appeal only to graduates of that School. But it is beautifully composed, admirably edited and contains such a variety of plates illustrating work of the School's famous alumni that probably every architect would prize it as his own. Included also is a record of the School alumni from 1877, its beginning, up to the present day.

## Nationally Planned Publicity

(*Continued from page* 44)

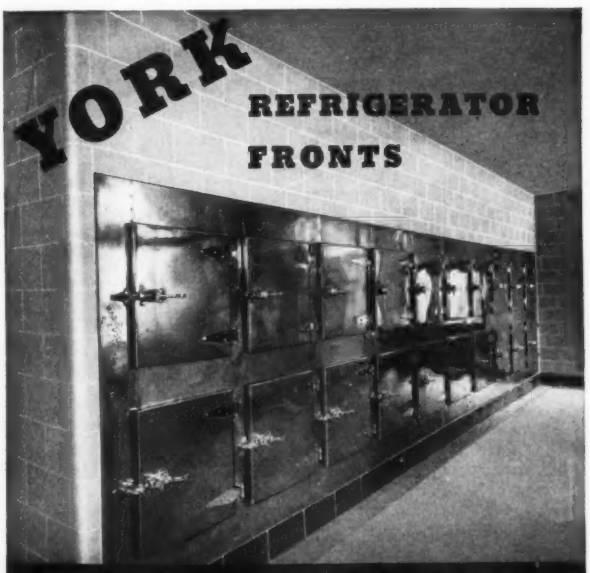
which, individually he might find impossible to develop. Backed by a nationally organized drive, he could make valid claims which otherwise might be unsupportable because of a lack of professional co-operation. He could demand adherence to a code of practice and a schedule of minimum fees. Through contacts gained in aiding local presentations of large-scale publicity drives he might reasonably expect a definite increase in the volume of his work.

In larger cities, also, the architects would undoubtedly derive individual benefit, even if such were confined to a greater public recognition of his work.

Evidences abound that architects need the energetic service of an able Public Relations Counselor. Steps toward the fulfillment of that need can be taken only by the individuals involved. Without question there exists a practical scheme by which the foregoing suggestions may be acted upon. The time is ripe for its inception. And if it is to be carried out most effectively, vigorous action should be taken at once to bring it immediately into being.

---

• An error on page 53 of the January AMERICAN ARCHITECT stated that $150,000,000 had been allotted for construction of the first low cost housing project in Atlanta, Ga. The figure should have been $2,700,000. The larger sum is the total housing appropriation.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# INDEX TO ADVERTISERS

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# Trends and Topics of the Times

(*Continued from page* 58)

the tower at the third colonnade, for it had already begun to lean dangerously. William of Innsbruck added to it in 1234 and reached the sixth colonnade. The work was finished 100 years later by Tomaso Pisano. When completed the top of the tower overhung the base by 13 ft. 10 in.

• The "Home of Tomorrow" at Mansfield, Ohio, built by the Westinghouse Company as a demonstration of modern electrical innovations was closed to the public December 2nd, pending its reopening as a Home Economics Institute. The remarkable equipment in this house was described in an article by Tyler Stewart Rogers in the March, 1934, issue of AMERICAN ARCHITECT.

• Prosperity is rapidly returning to at least one part of the country. Miami, Florida, is enjoying the greatest surge of building activity since the boom days of 1926. The value of construction in the first ten months of 1934 was more than double that of the same period in the preceding year.

• A change of policy has opened the Permanent Exhibition of Decorative Arts and Crafts (known as P. E. D. A. C.), Rockefeller Center, New York, to all architects and their clients. Formerly only recognized interior decorators were admitted to the galleries which are located on the 10th floor of the 70-story RCA Building. The new plan opens to the profession a group of exhibits of extraordinary interest and artistic merit embracing all types of interior decorative and finishing materials, and furnishings from fabrics and furniture to lighting fixtures, photo murals and accessories.

• A thirty-two page book of "master specifications" has recently been issued by the Reconditioning Division of HOLC. The book has been designed to serve as a guide to use of approved materials and construction practices in the repair and modernization work financed by the Corporation. Over two and one-quarter billion dollars of re-financing loans have been spent on over 740,000 houses by HOLC.

• A new document of the A.I.A. deals with the subject of architectural competitions. It formulates a code for their proper conduct and A.I.A. approval. Known as A.I.A. Document No. 263, the new rules are supplementary to A.I.A. Documents Nos. 213 and 238.

## PERSONALS

• If you change your address, please report the change direct to American Architect five weeks before the change is to take effect, sending both old and new addresses. The Post Office will not forward copies to your new address unless extra postage is provided by you. Our request is made to save you this expense and to assure the receipt of your American Architect

• Charles T. Ingham, F.A.I.A., of the Pittsburgh Chapter of the A.I.A., has been elected to serve as Secretary of the A.I.A. until adjournment of the 1935 A.I.A. convention. Mr. Ingham replaces Frank C. Baldwin, who resigned as the Institute's secretary in December.

• Timothy Y. Hewlett and Thomas D. Best announce their association for the practice of architecture. The office of the firm will be 303 Richardson Building, Toledo, Ohio.

• Announcement is made that the firm name of Dunn and Copper, architects, has been changed to Munroe Walker Copper, Jr., architect, Hanna Building, Cleveland, Ohio.

• M. H. Westhoff, of Springfield, Mass., has temporarily given up his offices in that city. Until further notice he can be reached at 1216 Enfield St., Enfield, Conn.

• Francis P. Sullivan, of Washington, D. C., has been appointed chairman of the A. I. A. Committee on Public Works to succeed Louis La Beaume. Mr. Sullivan, a former president of the Institute's Washington Chapter, has been serving as chairman of the A. I. A. Committee on the National Capital and as a member of the Architects' Code Committee.

## ANNOUNCEMENTS

• The American Institute of Steel Construction has announced its Seventh Annual Bridge Competition, open to students of architecture and engineering and offering a first prize of $100. Information regarding details of the competition, drawings for which must be received not later than March 16th, may be obtained from the executive offices of the American Institute of Steel Construction, 200 Madison Avenue, New York, N. Y.

• The Eleventh Annual Competition for Small Sculpture in White Soap has been announced. Prizes given by the Procter & Gamble Co. will be awarded in a variety of classifications. The competition closes May 1st. Information regarding it may be obtained by addressing the National Soap Sculpture Committee, 80 East 11th St., New York.

## DEATHS

• Julian L. Peabody and Mrs. Peabody were both lost at sea when the steamer Mohawk was rammed and sunk off the New Jersey coast on January 24th. Mr. Peabody, who was fifty-three years old, studied at Harvard University and at L'Ecole Des Beaux-Arts in Paris. After association with several architectural firms, including that of Grosvenor Atterbury, he formed his own organization under the name of Peabody, Wilson & Brown with offices in New York City. Mr. Peabody's firm was noted for the design of many large country houses and also had executed numerous public and commercial buildings. Mr. Peabody was a member of the American Institute of Architects and the Architectural League of New York.



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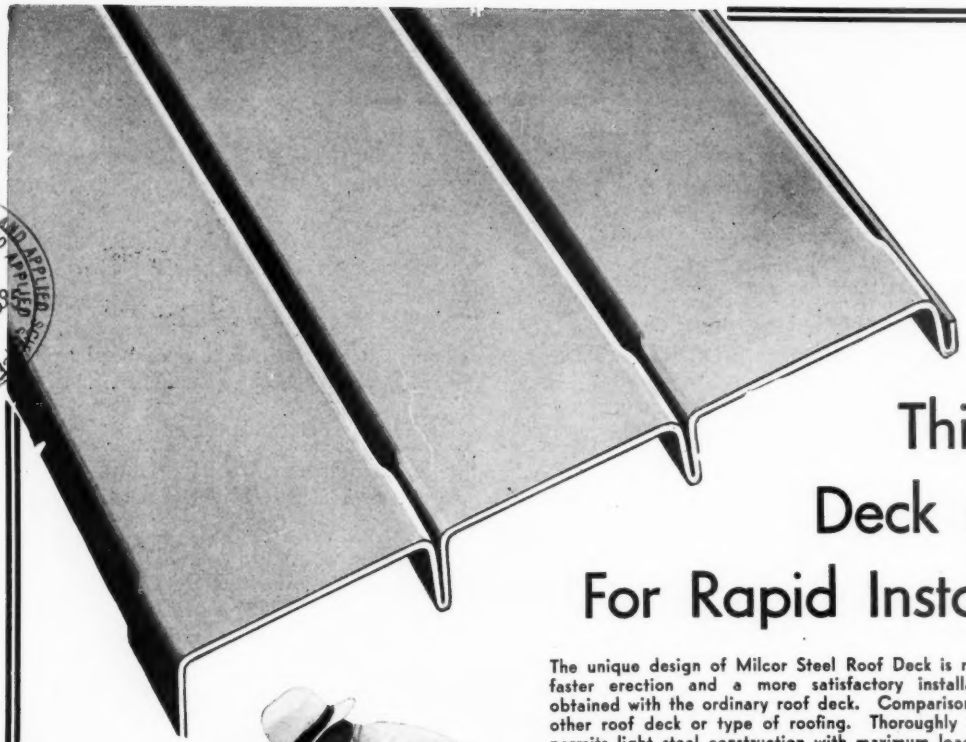

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