ARCHITECTURAL FORUM

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THE MONTH IN BUILDING

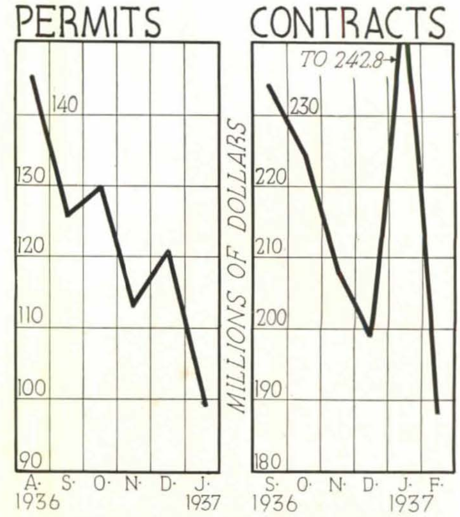
VOLUME

PERMITS (January)	**$99,072,795**	**CONTRACTS (February)**	**$188,590,800**
Residential	41,550,992	Residential	63,011,700
Non-Residential	35,704,755	Non-Residential	65,951,300
Alterations	21,817,048	Heavy Engineering	59,627,800
December, 1936	121,382,499	January, 1937	242,844,000
January, 1936	89,890,238	February, 1936	140,419,100

Permits are from 1,559 cities reporting to the Department of Labor.

Contracts are from 37 States east of the Rockies, F. W. Dodge statistics.

For the twenty-fifth consecutive month, permits exceeded the totals of the similar month in the previous year. Sluggishness due to January weather, however, pushed the volume of permits down in both the residential and non-residential categories. Contracts, which follow on the heels of permits by anywhere from a week to two months, mirrored the sag of the January market. Residential contracts were more than 50 per cent higher than for February, 1936, non-residential building also showing a relative increase. The apparently severe drop in the charts at the right serves only to reflect the expected decline from August's crest to January's trough.



WAGNER BILL. During his last election campaign the only specific commitment for legislation which President Roosevelt made was "to do something for Housing." But last month when the Wagner-Steagall Housing Bill made its bow to Congress, it lacked Presidential support. Reason was not that the President had lost interest in Housing, but that he did not approve of the Wagner-Steagall solution.

Under the provisions of this Bill, the Federal drive for low-rent housing is to be put in the hands of a three-man U. S. Housing Authority. This authority will have two ways to help local housing authorities: 1) it may *loan* them up to the full construction cost of a project over a period of 60 years at the going rate of Federal interest; and 2) it may make annual *grants* to the local authorities up to 3½ per cent of the original construction cost. These grants are designed to make up the difference between the gross rental income and the annual carrying charges of the project. Thus, so far as Federal subsidy is concerned, the main difference between this year's Wagner Bill and last's is that the new version does away with the idea of the capital loan or capital write-off. This tends to increase the degree of Federal control over the operation of the various projects under its jurisdiction.

Three large objections immediately appeared on the political horizon to dim to a very feeble glow the Bill's chances of passage in its present form. First objection was purely financial and emanated from the office of Secretary of the Treasury Henry Morgenthau. Under the Bill the Authority will have the power to loan up to one billion dollars on construction costs. Since the Authority may also make annual grants up to 3½ per cent of the total construction cost, it looked to the Secretary of the Treasury as though the Government were in fact undertaking to hand out at last $35,000,000 a year in grants over the next sixty years, or more than two billion dollars in all. Giving out twice as much in grants as in loans, and giving it out at such a clip, he found distinctly out of order. So did the President.

In the second place private interests were fearful of the new Bill because its provisions did not seem to remove Federal housing projects from the competitive field with sufficient finality. The only specific limit placed on the income of the occupants of a Federal project by the Bill was that their income should not be more than "five or six" times greater than the rent. To many this seemed like putting the cart before the horse in that, while it limited the income of tenants, it did not limit the rent the local authorities could charge.

Finally, it was pointed out by both professional housers and private builders that the new Bill placed no effective limit on the original construction cost, which determines the economic rent. Instead, the Bill places a premium on high first costs by making the size of the annual grants a percentage of the construction cost. Thus the larger this cost is, the higher the annual grants can be made.

Dead ahead for the Bill there obviously lay a severe mangling in Committee, possible death. More likely in view of the President's demand for action, appeared the alternative of passage after a thoroughgoing modification.

AIR CONDITIONING. Air conditioning last year earned $60,000,000, an increase of 58 per cent over 1935. Last month the industry was happily examining the significance of a January volume 215 per cent higher than that of January, 1936 as indications of a banner 1937. Bulking biggest in this speeding parade are the eleven members of the Air Conditioning Manufacturers Association.* *But* sheer growth continues most impressively among the small manufacturers of air conditioning apparatus, of whom last month the prosperous Trane Co. made the most resounding news.

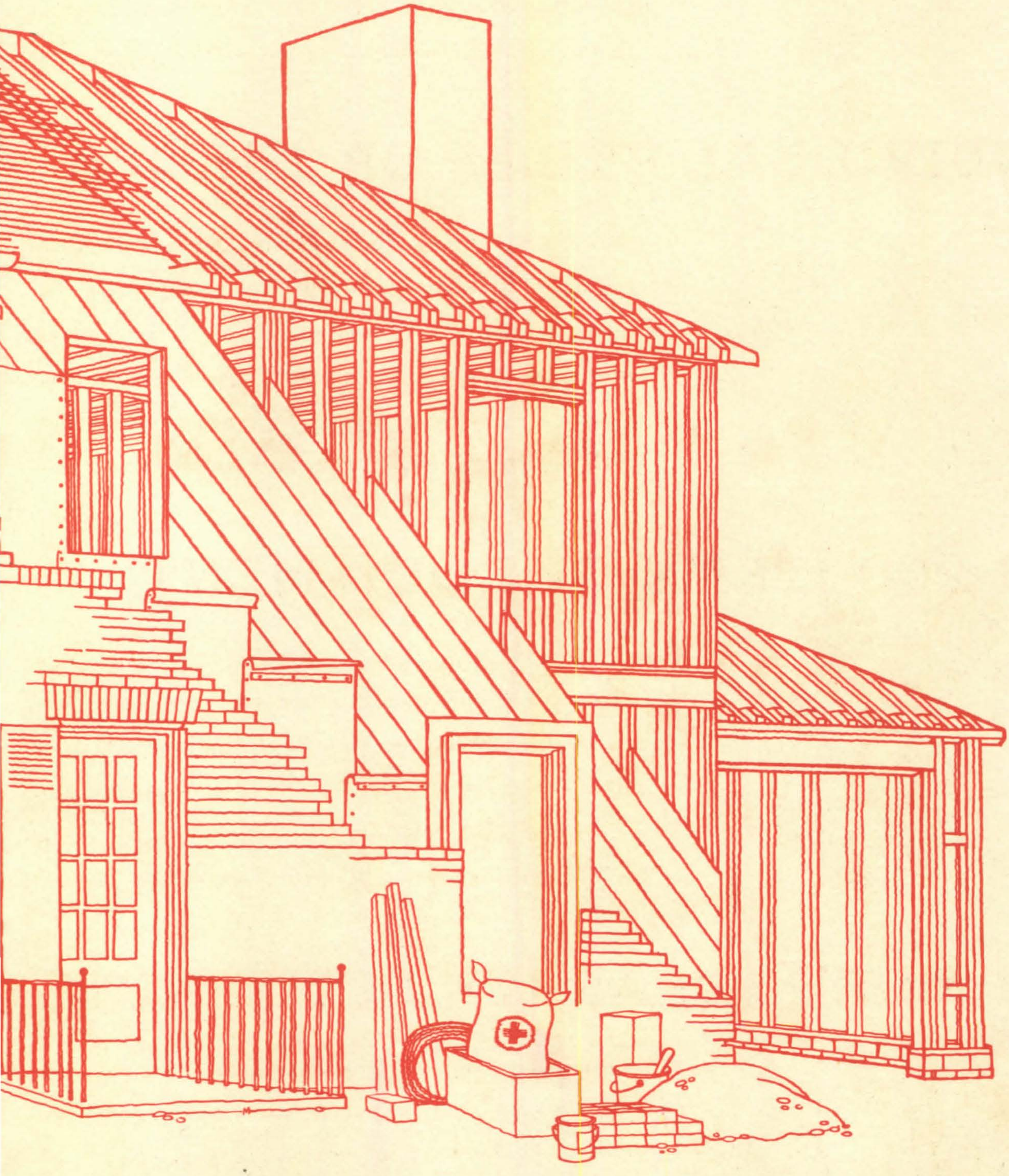
Since its founding as an obscure plumber's shop 50 years ago, Trane's common stock has been tightly held by Founder John A. Trane's family and friends. Last month, capping an expansion program, Trane filed with the SEC a petition to register 255,000 shares of common stock at $2 par, of which 67,500 were open to the public. Purpose was announced as the purchase of further equipment. Offering price was $14.50. Also last month Trane revealed that on a relatively trifling $3,000,000 worth of 1936 sales, there had been a profit of $325,000, topping the

* The eleven ACMA members, who gross some 90 per cent of the industry's business: Baker Ice Machinery, Carrier, De La Vergne Engine, Delco-Frigidaire, General Electric, Kelvinator, Parks-Cramer, B. J. Sturdevant, Vilter Manufacturing, York Ice Machinery, Westinghouse.

THE INTEGRATED HOUSE

—a new approach to cost reduction

IT TAKES MORE THAN 30,000 PARTS



TO BUILD A TYPICAL HOUSE

Counting only items which must be ordered as such—not counting things like nails and screws, separate pieces of assembled parts like hardware, pieces cut in two on the job, loose or plastic materials, etc.

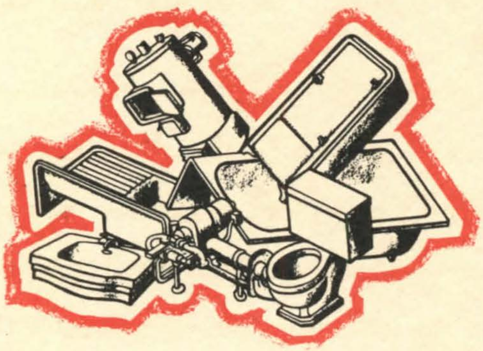
MORE THAN 500 OPERATIONS

like sawing, hammering, planing—some of which must be repeated more than a thousand times; all sorts of processes with all sorts of materials. Few kinds of manufacture are technically so involved, require so many different and highly specialized and elaborately interlocking types of work. And to perform these operations takes more than

20 INDIVIDUAL SKILLS OR TRADES

many of which are years in the learning, some of which are needed on the job for only a few hours or days per house. Trades that are closely organized in narrow, bureaucratic craft unions, constantly involved in petty jurisdictional disputes. Trades which receive high hourly wages, but, because of irregular employment, net a low income per year.

OVER 200 ITEMS OF EQUIPMENT

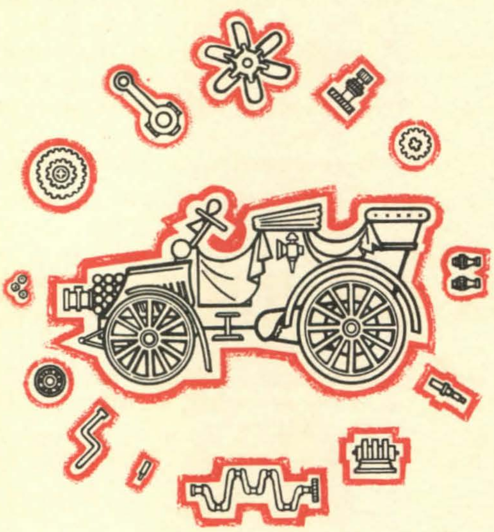


equipment for the house and equipment the better to build it, a number which is growing larger every year. Equipment in some cases more delicate and complex than that of a train or boat, which can be produced only by modern mass production technique, and which increasingly is the determining factor in the sale and resale of the everyday house.

15 OR MORE SEPARATE CONTRACTS

with all the overlapping and waste and duplication of overhead which they entail. Fifteen or more contractors' profits, contingency allowances, hit-or-miss estimates. Fifteen or more guarantees of, and individual responsibilities for, the proper performance of the separate parts and equipment of the completed house.

CARS HAVE LOTS OF PARTS, TOO—



More than 5,000, by actual count. But in spite of this, automobiles are much more efficiently produced than houses—a fact which has caused housing's theoreticians, and particularly the proponents of prefabrication, continually to contrast the two. But the automobile, as a product, has the tremendous initial advantage of being, by definition, a highly mobile unit, easily transported from place to place and, therefore, susceptible to complete shop fabrication and assembly. And so far there are no signs that the American people are prepared to accept permanent housing in a form equally transportable and therefore susceptible to the same production technique as automobiles. The prefabricated house, in the form of a truckable unit which can be entirely finished in the shop, is still a long way off. Whatever changes do take place, housing will probably for some time continue to be assembled at the site.

THE INTEGRATED HOUSE

is the name which really should be applied to the kind of prefabrication which does not involve the completion of the housing unit in the shop. But it is not the change in name, but the change in thinking implied in the new name, which is important; for the early theoreticians of prefabrication stand convicted of loose thinking by the results, or rather the lack of results, which their theories have produced. Clearly, there must have been something radically wrong with a way of thinking which confidently promised to start shelling out mass-produced houses overnight at a price everybody could afford and which failed conspicuously to do so. Certainly such a body of theory is worth examining carefully to find out exactly where the prefabricators jumped the track.

The critique of conventional house construction advanced by the advocates of prefabrication was essentially sound. Although they have failed to produce mass housing, they have succeeded in producing an approach. Their error lay in the

fact that their practical proposals did not jibe with their theoretical analysis. In proposing belt-line production for houses, the prefabricators failed to recognize determining factors peculiar to the house construction industry.

These special factors are many, but foremost among them is the fact that houses, unlike other consumers' goods, last a long, long time. A great many of the houses built 150 years ago are still standing, still in use. It is because of their durability that houses constitute a long-term investment. And because of this, the individual consumer is able to afford much more elaborate and costly housing than he might otherwise be able to. This fact has led to other special features of house construction, the importance of which is basic. For the long period of usefulness of the typical house implies that houses must continually be kept at least reasonably up-to-date. And this has actually been done. The effect upon the building business has been enormous.

During the past 50 or 60 years the house, and particularly the equipment of houses, has improved tremendously. Central heat, gas piping, electric light, and modern plumbing have successively been added to the structural shell of the typical house. And for each of these improvements there has always existed, at the time of their introduction, two markets: the relatively small new house market, and the much larger market represented by existing homes. Naturally, therefore, each of these improvements was worked out in a form equally applicable to existing houses and new ones.

During the same period, the house has become an exceedingly complex mechanism, its production very involved. Manufacturers of building products have of necessity specialized, no one manufacturer producing more than a few of the vast number and variety of parts which go to make up the typical house.

The biggest mistake which the proponents of prefabrication *made* was to assume that individual manufacturers were prepared to produce all of the parts of a single house, willing to limit their market exclusively to new house construction. This mistake resulted from their failure properly to analyze current construction technique, their failure clearly to state an objective. Looked at soberly,

about all the prefabricators proposed to do was to apply mass production technique to portable sectional construction, in itself no new thing. But in order to do this they assumed that it would be necessary to turn the building industry inside out, combine manufacture, merchandising and assembly of housing units in a single super-organization. Only very recently have they begun to realize that mass-produced structural parts can be achieved within the existing framework of the building industry.

And only very recently the advocates of total shop fabrication have begun to realize that their objectives can be accomplished only by the orderly integration of building as a whole, the integration of conventional as well as prefabricated construction technique. That, in other words, prefabrication can be reached only in the same way as other big advances in building have been made.

INTEGRATION MEANS:

1. MODULAR DESIGN

Whereby the architect has the opportunity and the responsibility to start the process off by providing a basis in design for simpler, more uniform structural parts. Such a method of design has the triple advantage of resulting in immediate savings, impelling standardization, and making the house a better investment because of its adaptability to future changes and improvements.

2. INTERCHANGEABLE ELEMENTS

With structural elements and individual items of equipment, including the various units of systems of sectional construction, uniformly sized according to a basic module, and therefore interchangeable. Which makes possible the gradual introduction of sectional construction into the technique of everyday building, eventually the assembly *of the completely prefabricated house.*

3. MULTI-PURPOSE PARTS

By which is meant the simplification of house assembly resulting from the use of structural elements and items of equipment with a double or triple purpose, looking toward ultimate integration of all of the mechanical parts of the house in a "power plant"; integration of floor and wall units to the point where they perform all their functional requirements at once.

1. MODULAR DESIGN

WHAT IS A MODULE?

Most architects are inclined to think of modular planning as just another crackpot idea—an interesting theory, but not of much practical value. Judging by the results of modular planning so far, they are pretty nearly correct. Mention modular planning, and what most people think of is a network of equally spaced lines forming squares which walls, partitions, doors and windows are made to fit. In this kind of modular design a planning unit of fairly large size—somewhere between 2 ft. and 4 ft.—is used, which in turn is sometimes subdivided into halves, quarters, and thirds, and the foot rule and its division into inches thrown overboard. In most cases this type of unit represents an effort to set up a common size for such elements as doors, stairs, hallways, windows, etc., which are generally made somewhat different in size for good and sufficient reasons.

ORIGIN OF THE MODULE

But this is only one kind of modular design. Some sort of module, based on the structural system then in use, has been the conscious or unconscious basis of design since building began. Usually, the repetitive element has been the distance between piers or columns, the "bay." Other elements, such as windows, have also been made uniform in size so that the width of piers, etc., constitutes a repetitive modular pattern. This is as true of Classic as it is of Gothic architecture, and is common practice in the design of most buildings, big and small, today. Because the basic unit used is seldom exactly the same in different buildings, this kind of modular design fails to operate as an integrating factor for the building industry as a whole. The resulting patterns have little in common, nothing, for example, which enables the manufacturers of windows, radiators, or office partitions to set up a common denominator of office building design to which he can gear the sizes of his products.

In house design, the absence of such an integrating factor is even more marked. It is true that certain architectural styles, such as the Georgian or Colonial, are based on the use of a repetitive design element, but just as in the case of larger buildings there is so much dissimilarity between the basic units employed from house to house that the value of these units as an integrating factor is largely destroyed.

SECTIONAL MODULARITY

Modular design has recently had a sort of re-birth as a result of the development of systems of prefabricated construction using sectional units. Again a module of from 2 ft. to 4 ft. has been employed, in most cases as the size of a series of structural sections which contain doors, windows, etc., form the openings for stairways of similar size. Notable is the variety of units which have been so used, a condition which results from the fact that no unit has been found which works perfectly for each of the elements involved and permits of sufficient flexibility in planning.

Recognition of the limitations of this kind of modular planning is found in some of the structural systems which have been introduced more recently. One such system, for example, employs a unit only 18 in. wide, which in turn may be subdivided into 9 in. parts. The use of a system of this kind does not necessarily imply that the practice of including windows and doors in prefabricated panels must be abandoned, for larger units of this kind may still be made up, so long as they are sized in multiples of the basic unit. And this arrangement has the important advantage that window units may be made different in size from door or other units, where such a difference in size is actually called for.

MULTIPLE MODULE

The unit used in this kind of modular design may be defined as the "multiple module." Modularity of this kind has much greater potentialities as an integrating factor for building as a whole than the type of modularity which employs a larger unit and attempts to make uniform the sizing of all the elements of house construction, since it provides for that variation in the sizing of these elements which experience has shown to be necessary.

Still another kind of modular design has been worked out in connection with certain lines of kitchen equipment recently developed. Here two basic units, differing in size, are used. This is really the "multiple-module" in another guise, since the unit actually at the basis of the system is the factor common to both of the standardized elements. Thus such a system using, for example, 12 in. and 16 in. as the standard elements actually has as its basis 4 in., the greatest common denominator of the two, and is capable of producing assemblies with overall lengths in any multiple of 4 in. above 2 ft., in spite of the fact that the smallest unit employed is 12 in.

This principle is exceedingly valuable in helping to solve a number of problems which arise in the process of actually applying any system of modular design to practical work. Particularly in sectional construction, and in structures employing combinations of prefabricated sectional units and conventional construction, this extension of the theory of the "multiple-module" permits the use of a minimum number of standardized structural units while at the same time providing for maximum flexibility in working out plans.

HOW DOES IT WORK?

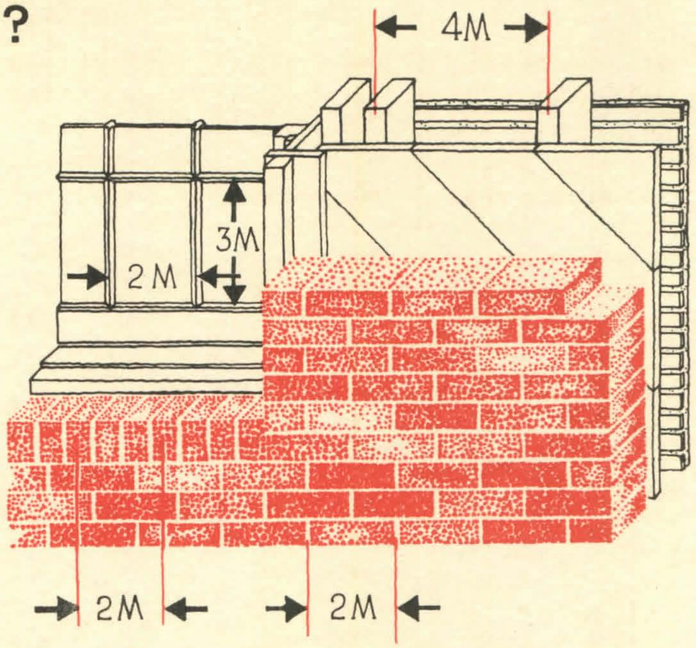
Prime consideration in the technique of modular planning must be workability—workability in relation to the structural system which is actually to be employed. Nothing should be included in such a method which serves no useful purpose; nothing omitted which may result in a simplification of structural parts.

Such a system of modular design offers the architect certain immediate and concrete advantages, and at the same time the prospect of cumulative integration of building practice as a whole. Cost savings which can be shown to result from modular planning are only a part of the immediate advantage realized. The opportunity to use plywood paneling and other large building units with the knowledge that the jointing will work out properly with the plan and around principal openings is an example of another such gain. And at the same time there is the assurance that the increasing currency of such planning methods will stimulate standardization on the part of manufacturers of building materials and multiply original benefits.

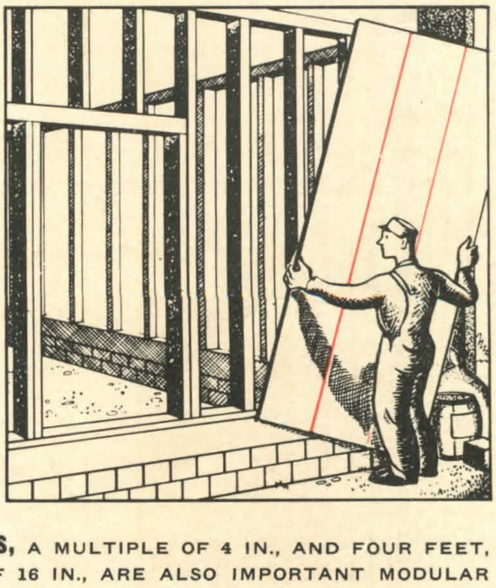
Experience in working out sectional structural systems has been exceedingly valuable in clarifying a great many of the problems involved in modular planning. The outstanding lesson which has been learned in the process of applying the modular method to sectional construction is that proper allowance must be made in such a system for the actual structural design of connections between intersecting walls, at corners and between other structural elements. It has, for instance, been found convenient to place exterior wall panels outside the modular network, in order that partition panels and floor panels may be identical in size.

SMALLER UNITS

Experience such as this is giving rise to a new and somewhat different concept of the module. Recognition of the fact that the idea of a house consisting of walls, floors and roof is true only in an elementary sense—that in actual practice the floors, walls, etc., intersect; that consequently the thickness of the walls and floors plays an important part in any modular system—has led to the realization that wall thickness must be made the basis of any such system. The late Albert Farwell Bemis was the first to give definite expression to this concept of the module. In his book "Rational Design" (Vol. III of the series "The Evolving House"), Mr. Bemis pointed out the necessity for basing a system of modular design on the structural thickness of exterior walls, and the fact that 4 in. or a multiple of 4 in. is the structural wall thickness in the overwhelming bulk of American housing, suggested 4 in. as the possible basis of a universal system of modular design.



"GREATEST COMMON DENOMINATOR" OF AMERICAN HOUSE CONSTRUCTION IS 4 IN., A FIGURE WHICH IS EITHER THE NOMINAL SIZE, OR A FRACTION OR MULTIPLE OF THE NOMINAL SIZE, OF THE GREAT MAJORITY OF BUILDING PRODUCTS.



SIXTEEN INCHES, A MULTIPLE OF 4 IN., AND FOUR FEET, A MULTIPLE OF 16 IN., ARE ALSO IMPORTANT MODULAR DIMENSIONS AND THE BASIS OF SIZING MOST WALL AND SHEATHING BOARDS.

MODULAR PLANNING IS EASY

And the best way to prove it is by working out a modular method for a given system of construction. The great majority of American houses are built of wood frame, brick veneer, brick, and concrete block. If a system of modular design which applies to these three structural systems can be devised—one that is good enough, and simple enough to be spontaneously adopted by the majority of architects—the first big step in the integration of the home-building industry will have been taken.

The Editors of THE ARCHITECTURAL FORUM do not believe that such a system of design can be worked out in its entirety by any one man or any one group of men. Nor do they believe that such a system, once it has been worked out, will remain exactly the same for any long period of time. But they do believe that the method here described is one which may well be adopted as a working basis from which such a modular system can be developed. This method is simply a summation of the experience which architects and others have had so far in working with modular design. Only its gradual modification by architects in actual practice will eliminate all the bugs it is bound to contain. Only its use by architects in everyday work will bring about changes in material sizes which at present do not fit into the system.

THE FOUR-INCH MODULE

The basic unit common to these forms of house construction is 4 in. The object of a system of modular design based on this unit must be to expand the basic unit, by multiplication, so that it provides for simplification of construction practice, more standardization of individual parts and items of equipment, and greater interchangeability of these parts. It has already been pointed out that the almost universal center to center dimension for wood framing, furring, etc., 16 in., is just such an expanded unit. Obviously, any realistic modular method for this type of construction must have as its basis this fundamental element, take into account current framing practice.

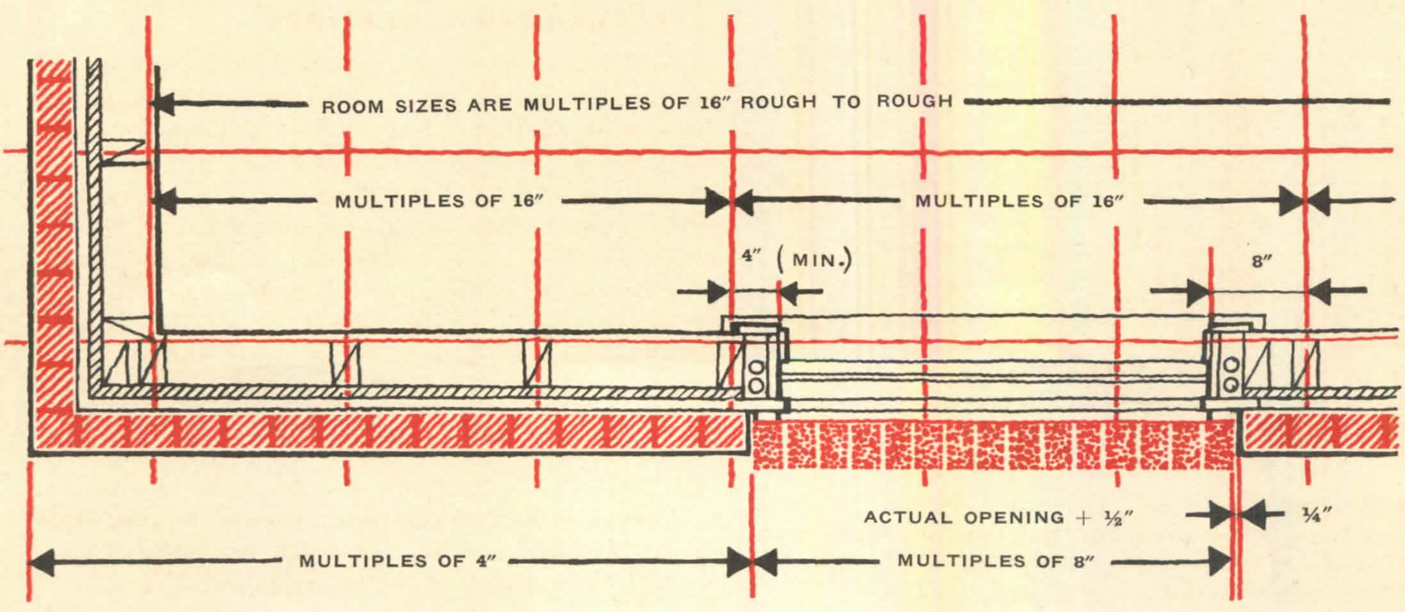
This kind of modular planning involves more an awareness of the structural frame than adherence to any set rules. Beyond making the larger rooms correspond in size to a multiple of 16 in., placing rough openings for windows and doorways in relation to the structural frame, and considering at all times the actual method of assembly of structural parts, there are few definite rules governing this type of modular planning.

SCOPE

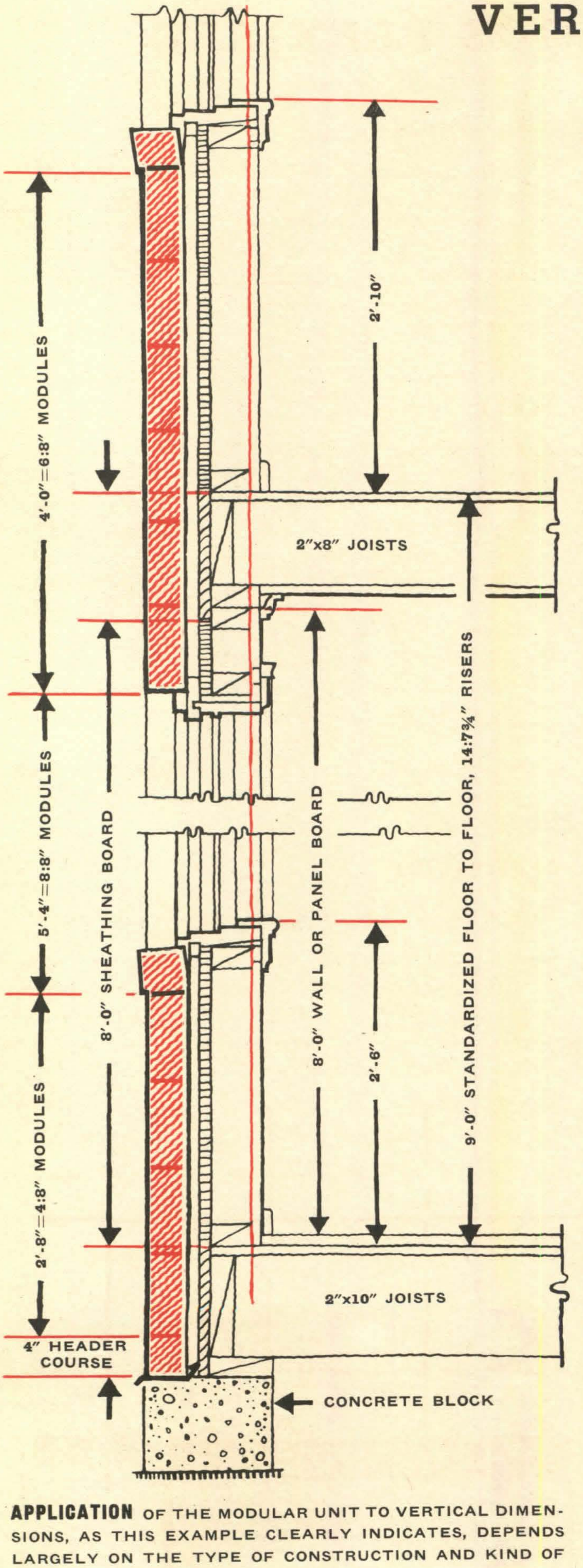
This does not mean, however, that modular planning of this kind is limited in scope. Relative to a particular structural method, the basic technique may be expanded to include a host of other factors which can only be touched on here. Clearly the problem is one to be worked out according to the type of construction ordinarily employed, the kind of building ordinarily planned. The modular method developed for sectional and semi-sectional construction will naturally be somewhat more rigid than the method developed for conventional construction; but the basic principles remain the same. In either case the object is to develop a system which takes maximum advantage of the benefits resulting from standardization while at the same time sacrificing little in the way of flexibility.

APPLICATION

In the drawing below, such a system of modular planning has been worked out for brick veneer construction. Substantially the same system would apply to wood frame or solid brick construction as well, except that in each of these cases some of the limitations resulting from the brick veneer form of construction would be removed, and the method somewhat simplified.



VERTICAL DIMENSIONS



APPLICATION OF THE MODULAR UNIT TO VERTICAL DIMENSIONS, AS THIS EXAMPLE CLEARLY INDICATES, DEPENDS LARGELY ON THE TYPE OF CONSTRUCTION AND KIND OF DESIGN EMPLOYED.

It is desirable that the vertical module used in determining vertical overall dimensions be the same as the module used in determining horizontal dimensions; that standardized floor-to-floor dimensions be set up, based on a standard height for stair risers, and variable by one or two risers in either direction; that these standard dimensions take into account such factors as present wall and panel board sizes, stud length, width of sheathing and so on. But it is not possible to do all of these things at once, at least not perfectly.

BASIC UNIT

The first requirement is the easiest to carry out. Most of the units in common use for wall construction are multiples of the basic module or may be so applied that they are. Concrete blocks are already made in multiples of 4 in. including joints, the most economical size being 8 in. high and thick by 16 in. wide—perfectly adapted to modular design. Brick, although commonly laid three courses to 8¼ in., may be laid three courses to 8 in. by reducing the width of the horizontal joint by only 8 hundredths of an inch. Wood siding and shingles may also be laid 4, 6, and 8 in. to the weather.

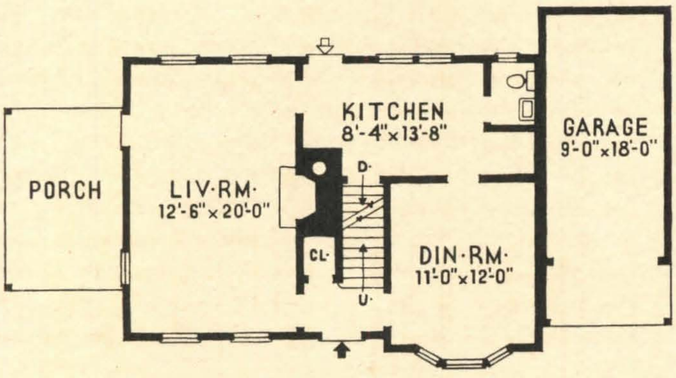
It is with the second requirement, standard floor-to-floor dimensions based on standard riser height, that most difficulty arises. This is because the desirable height for stair risers is a very exact thing, and does not happen to correspond with the module or to be a fraction or a multiple of it, or even a fraction *OF* a multiple. Opinion as to the desirable riser height for small houses may and does vary, but only between the narrow limits of about 7¼ and 7¾ in. Considering the possible standard floor-to-floor dimensions which are multiples of 4 in. between 8 ft. and 9 ft. 4 in., and standardized riser heights of approximately 7½ and 7¾ in., there are two possible series of floor-to-floor dimensions produced. For the 7½ in. riser: 8 ft., 8 ft. 8 in. and 9 ft. 4 in. For the 7¾ in. riser: 8 ft. 4 in., 9 ft. and 9 ft. 8 in.

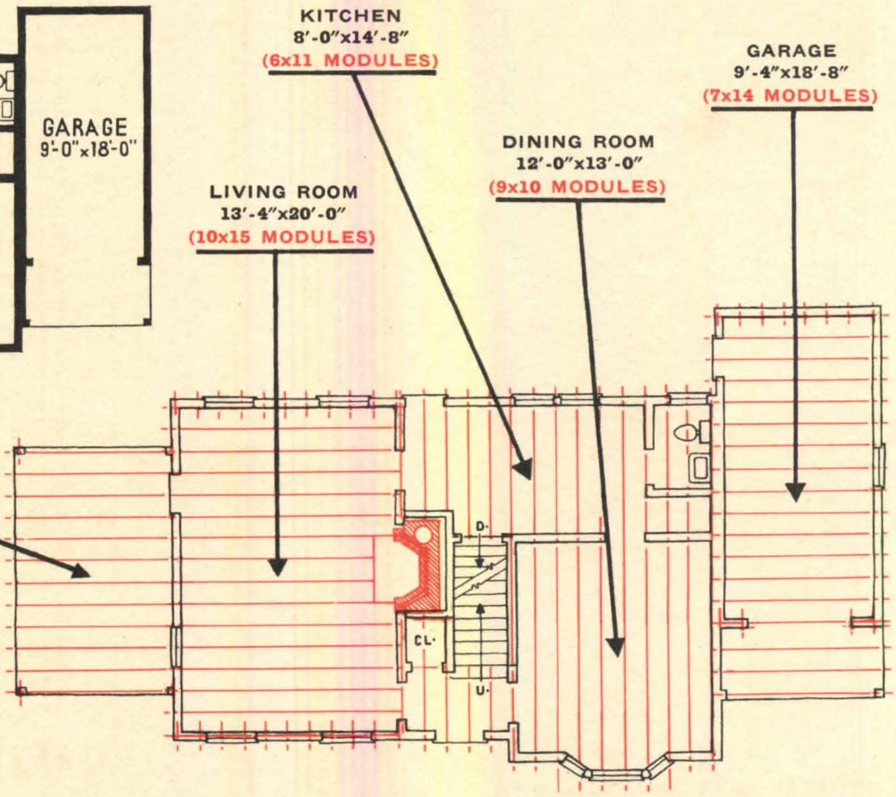
STANDARDIZED DIMENSIONS

In order to show by example what the possibilities of vertical modularity are, the floor-to-floor dimension of 9 ft., with fourteen 7¾ in. risers, has been chosen as most nearly representing current standard practice. This choice carries with it the alternatives of an 8 ft. 4 in. floor-to-floor with thirteen risers and a 9 ft. 8 in. floor-to-floor with fifteen risers. It so happens that while all of the dimensions in this series are multiples of 4 in., none is a multiple of 8 in. This serves the valuable purpose of illustrating the fact that a system of vertical modularity employing 8 in. structural units may still be worked out on a basis of 4 in. multiples.

In the drawing at the left a typical system of vertical modules has been worked out to fit a particular kind of construction, in this case brick veneer. This example shows how it is possible to develop such a system so as to take into account all of the factors involved.

MODULAR PLANNING IS FLEXIBLE





THE PLAN IN THE UPPER CORNER WAS CHOSEN AT RANDOM TO ILLUSTRATE THE FLEXIBILITY OF MODULAR PLANNING. AS THE LARGER ILLUSTRATION SHOWS, FEW IMPORTANT MODIFICATIONS ARE NECESSARY IN ORDER TO ADAPT THE DESIGN TO THE SIXTEEN INCH MODULAR UNIT.

STANDARDIZED SIZES

4" MODULES

NO.	DIMENSIONS		REMARKS
1	4"		NOMINAL STUDS
2	8"		NOMINAL JOISTS
3	12"	1'-0"	NOMINAL JOISTS
4	16"	1'-4"	CUPBOARD DEPTH
5	20"	1'-8"	
6	24"	2'-0"	
7	28"	2'-4"	
8	32"	2'-8"	CLOSET DEPTH
9	36"	3'-0"	MINIMUM HALLS
10	40"	3'-4"	
11	44"	3'-8"	LAVATORY WIDTH
12	48"	4'-0"	

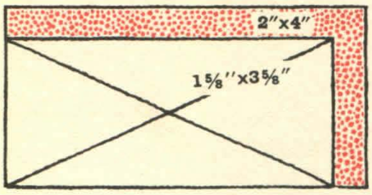
8" MODULES

NO.	DIMENSIONS	REMARKS
7	4'-8"	
8	5'-4"	BATH WIDTH
9	6'-0"	
10	6'-8"	BATH LENGTH
11	7'-4"	
12	8'-0"	KITCHEN WIDTH

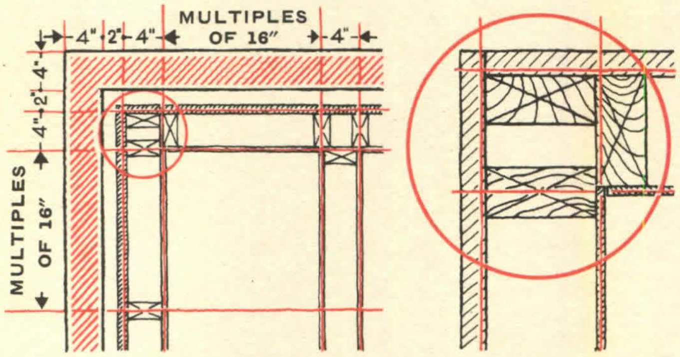
16" MODULES

WIDTH	NO.	DIMENSIONS	LENGTH
MINIMUM KITCHENS, ETC.	6	8'-0"	
	7	9'-4"	
SMALL	8	10'-8"	
	9	12'-0"	MINIMUM
STANDARD SPAN 14'-0" JOISTS	10	13'-4"	SMALL
LARGE	11	14'-8"	STANDARD BEDRMS., ETC.
	12	16'-0"	SMALL LIVING RMS.
LARGEST	13	17'-4"	
	14	18'-8"	STANDARD LIVING RMS.
	15	20'-0"	
	16	21'-4"	
	17	22'-8"	LARGE
	18	24'-0"	
	19	25'-4"	
	20	26'-8"	
	21	28'-0"	
	22	29'-4"	
	23	30'-8"	
	24	32'-0"	LARGEST

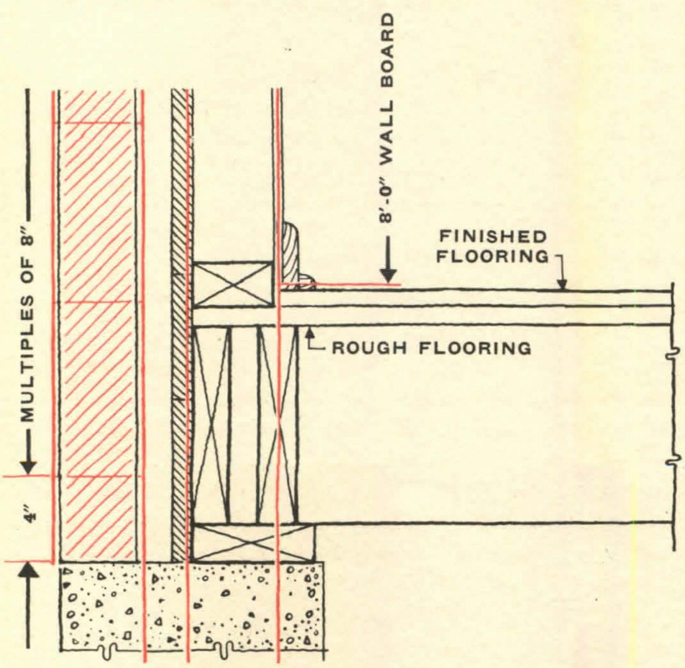
NOMINAL AND ACTUAL SIZES



The question of the discrepancy between nominal and actual sizes of structural materials is one which has greatly, and really needlessly, concerned the theoreticians of modular design. This supposed problem is one which architects have in practice found no difficulty in solving in the past, and there is no good reason why modular design should cause them any difficulty in the future. In spite of the fact that wood stud partitions are actually only 3⅝ in. thick in the rough and that plaster is generally ¾ in. thick, architects have long dimensioned such partitions as 4 in., considered their finish thickness as 6 in. And carpenters have long drawn two lines 4 in. apart on the floor, set the sole of the partition midway between the lines.



TYPICAL DETAILS (CORNER PLAN, ABOVE, AND WALL AND FLOOR SECTION, BELOW) WHICH SHOW HOW THE DIFFERENCE BETWEEN NOMINAL AND ACTUAL SIZES MAY BECOME AN ADVANTAGE IN WORKING OUT THE FINER POINTS OF A SYSTEM OF MODULARITY . . .



. . . IN THIS CASE THE FACT THAT WOOD FRAMING MEMBERS ARE ABOUT ⅜ IN. LESS THAN NOMINAL SIZE MAKES ROOM FOR THE JUNCTURE OF WALL AND PANEL BOARD AT THE CORNERS OF THE ROOM.

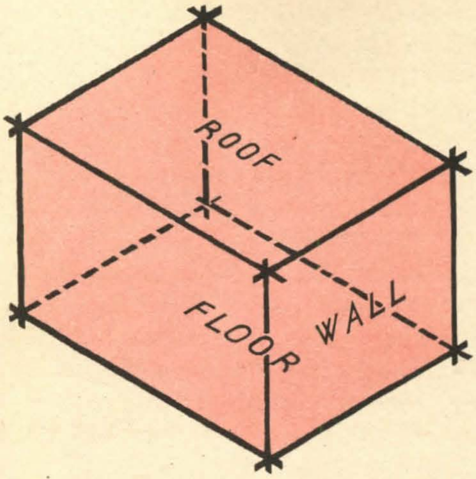
WHY THE DIFFERENCE

There are, as a matter of fact, good and sufficient reasons for many of the apparently senseless discrepancies between the nominal and actual sizes of structural materials. Let us take, for example, the notorious fact that a "two by four" is not a 2 x 4 in. at all, but usually 1⅝ x 3⅝ in. We can discover the reason for this by analyzing a simple operation which takes place again and again on almost every building in the course of construction. Let us suppose that the carpenter needs two 2 x 4's and has only a 2 x 8. He rips the standard 2 x 8 in half with his saw, planes the edges smooth, and, if he is an average carpenter working with average tools, has two 2 x 4's of exactly the standard size. This is because he has lost from each piece in the process of sawing and planing exactly $\frac{3}{16}$ of an inch—in just the same way that the mill, which made most of the 2 x 4's used on the job, lost the same $\frac{3}{16}$ of an inch. But had he begun with a piece of wood exactly 2 x 8 in. he would not have gotten two pieces 2 x 4 in., but two pieces 2 x 3 $\frac{13}{16}$ in. In the same way the fact that 4 x 8 ft. wall board is generally made about ¼ in. less than this size is accounted for by the fact that it is desirable to set board of this kind, with this amount of clearance, on studs placed exactly 16 in. on centers.

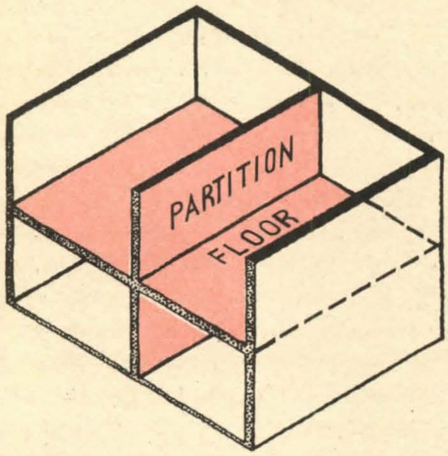
Naturally, materials which do not require this kind of working or this clearance in setting may advantageously be made to exact sizes, although even such supposedly standardized things as rolled steel beams vary in size appreciably with the wear of the rollers.

The point is that a certain amount of difference between nominal and actual size must be accepted and made a part of any system of modular design. The amount of such variation will naturally depend upon the materials used, and therefore upon the system of construction employed, as does the system of modular design itself. How such discrepancies between nominal and actual sizes may actually be turned to advantage is illustrated by the drawings at the left, where the problem is worked out relative to the system of modular design for wood frame and brick veneer construction.

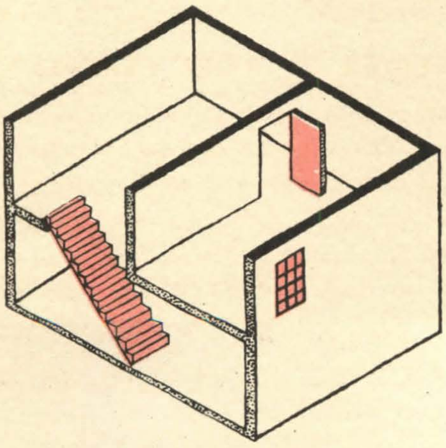
2. INTERCHANGEABLE ELEMENTS



CONSTRUCTION



DIVISION



ARTICULATION

Given modular design on the part of architects, what can manufacturers of building materials do to further the cause of the Integrated House? Since houses are, and will probably continue for some time to be, an assembled product, the biggest need of the building industry is standardized, interchangeable parts. The first part of this article has shown how a basis in design can be provided for standardized parts of this kind. This is integrated design. The purpose of this part is to indicate what can be done with current construction practice to simplify and coordinate various structural systems. This is integrated construction.

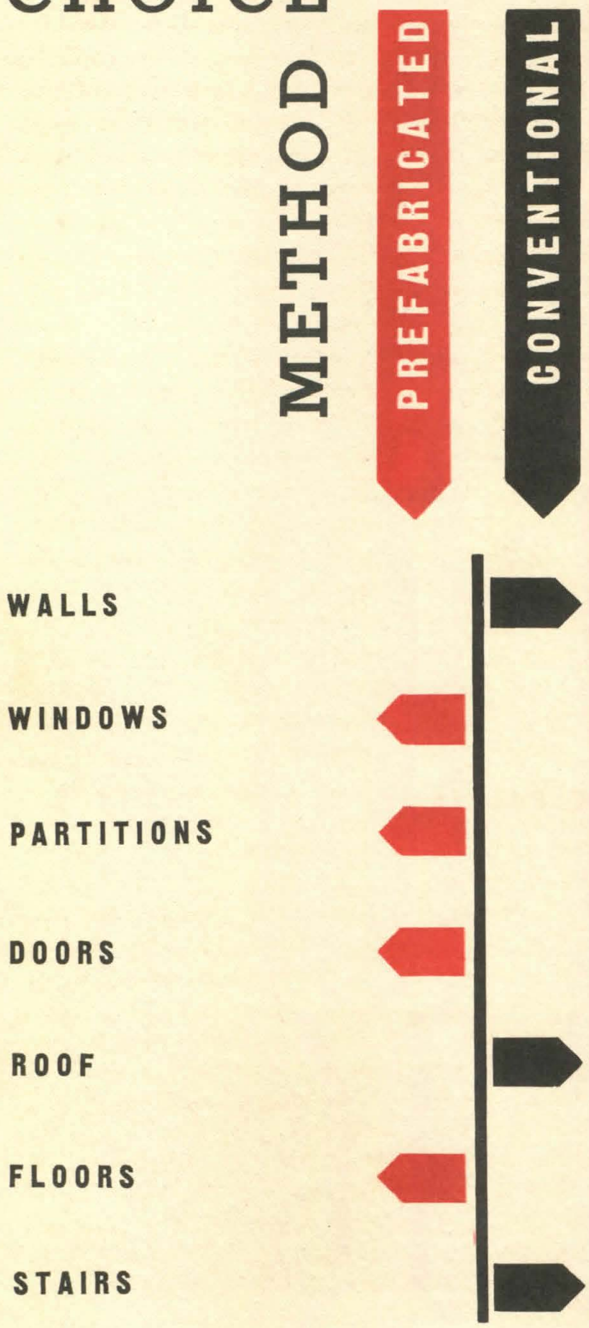
House construction is tending toward an ever greater degree of shop fabrication. New systems of prefabricated construction are continually being absorbed into current construction technique so long as they are capable of being so absorbed. The mistake which some of the advocates of prefabricated sectional construction have made is that they have so designed their products that they are incapable of use in conjunction with other and conventional structural systems.

One of the reasons why no one has worked out a system of prefabricated construction in this way has been the fact that current construction practices appear to be so intricate and involved that it seems virtually impossible to adapt a given structural method to every possible condition. One of the prerequisites for such an adaptation of prefabricated structural systems to conventional construction is the simplification and coordination of current practice. The other prerequisite is that the prefabricated units be properly sized, and sufficiently flexible in combination to fit into ordinary houses and work with ordinary systems of construction. Wall and panel board, millwork such as doors and windows, are excellent examples of prefabricated units which have been worked out in this way. There is no reason why basic structural elements cannot be similarly worked out.

BASIC ELEMENTS

The structural elements from which a house is built up are comparatively simple. They may be subdivided according to function into three main groups: the elements used in construction, division, and articulation. Elements of construction are floors, walls, and roof; of division, partitions and floors; of articulation, doors, windows, and stairs. With modular design, there is no reason why conventional and prefabricated methods of construction cannot be used *interchangeably* for all the various elements. This, as a matter of fact, is exactly what is being done at the present time. Prefabricated windows and doors, stairways, etc., are used interchangeably with conventional construction in present-day work. And it is only those items which have been so worked out that they can be used interchangeably that have been integrated into current construction practice.

CHOICE



METHOD

The difference between conventional and prefabricated construction is a difference of method, and primarily a difference of method of assembly. Most of the elements of house construction, both conventional and prefabricated, are made up of a structural frame covered on both sides. The difference between prefabricated and conventional house construction lies in how, and more particularly where, the structural frame and its covering are assembled. In the case of conventional construction the frame is erected and the covering applied on the job. In the case of prefabricated construction, sections of the frame are assembled and the covering applied in the shop, the completed sections being attached together and erected on the job.

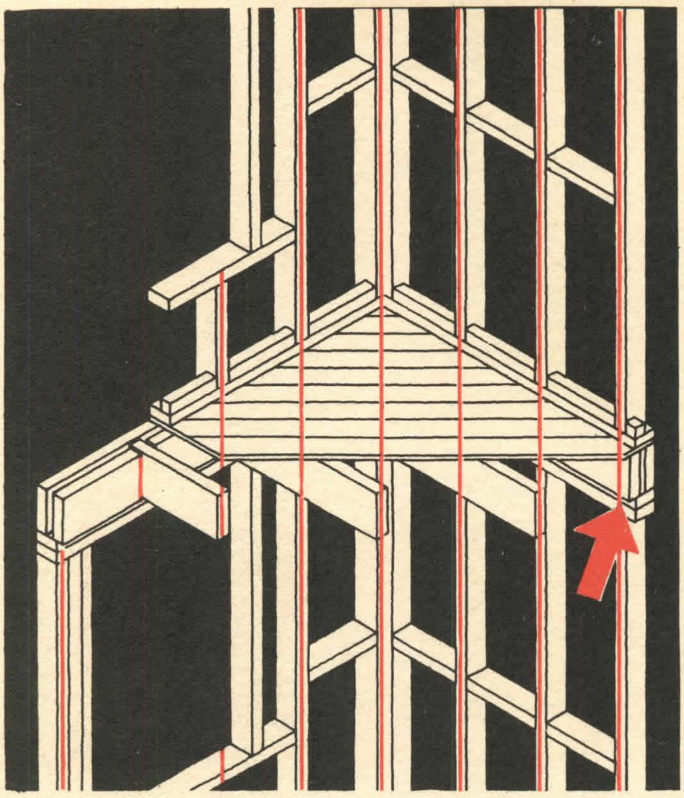
ADVANTAGES OF SHOP FABRICATION

The biggest advantage claimed for the prefabricated method has always been that shop assembly is more efficient and less costly than assembly on the job. Most of the items used in house construction today are shop fabricated, excepting only the structural shell. Shop fabrication has proved in practice, and to the satisfaction of all concerned, the best method of assembly for almost all of the parts of the finished house. Only the simplest and largest elements, the floors, walls, roofs, and partitions have escaped this tendency, and these not entirely. Besides the undeniable efficiency and economy of shop fabrication, it has proved in practice to have a good many other advantages. Most important of these has been the fact that the technique of shop fabrication has permitted the use of materials and processes resulting in better quality and lowered cost which it is not possible to employ in job assembly. This is because the repetitive nature of shop production permits the use of heavy and costly machinery capable of stamping or punching or rolling out a superior product from stubborn materials wholly unadapted to hand work, products which it would be impossible to duplicate on the job. Such products are generally lighter, stronger, more attractive, and a great deal cheaper than their counterparts made by hand.

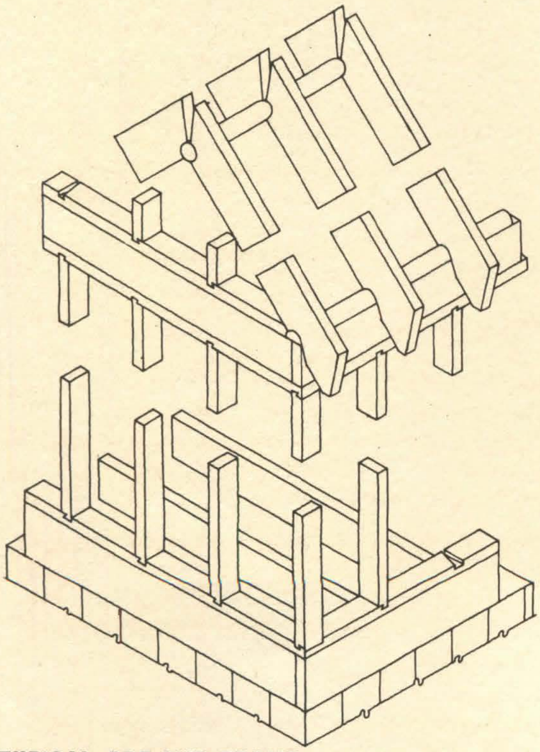
INTEGRATION OF SHOP FABRICATION

The question which confronts the building industry is simply this: Has the time arrived when the larger and simpler structural elements, such as the floors, walls, roofs, and partitions of the typical house can be produced more cheaply and better in the shop than on the job? This question will be answered only when prefabricated structural elements are separately available in such form that they can be incorporated into conventional construction technique in the same way that previous improvements of this kind have been incorporated. This process is now going on. Its acceleration by every possible means promises to put building on a technical plane with other current forms of production and to redound to the advantage of all concerned.

RATIONALIZED FRAMING



RATIONALIZED DESIGN FOR THE TYPICAL WOOD FRAME. ARROW INDICATES METHOD OF PLACING LAST JOIST AND SOLID BRIDGING TO PROVIDE FOR NAILING WALL OR PANEL BOARD. FOR THE SAME REASON, AND FOR BETTER NAILING OF SHEATHING BOARD, SOLID CROSS BRACING IS PROVIDED BETWEEN STUDS.



TYPICAL PRE-CUT FRAME, BASED ON THE SIXTEEN INCH MODULE. THIS KIND OF FRAMING IS MUCH MORE PRACTICABLE IN HOUSES PLANNED ON A MODULAR BASIS.

The way to set the stage for the introduction of prefabricated structural elements into conventional construction is by the rationalization of conventional construction technique. It would, however, be too much to expect that architects and builders would do this simply to prepare for prefabrication. The process of rationalizing conventional building technique must offer advantages which in themselves are sufficiently attractive to make the process one well worthwhile in a purely immediate sense. Fortunately, it does.

PRESENT STANDARDS

Typical wood framing practice is already relatively standardized. There are but two main types of framing in common use, Western or platform framing and balloon framing, and these two types have much in common, differing in but one important detail. Both types of framing employ 2 x 4 in. studs and 2 x 8 or 2 x 10 in. joists set on 16 in. centers as the basis of the structural frame. Platform framing differs from balloon framing in that the floors extend through to the outside face of exterior walls, interrupting the walls and bearing partitions at every floor, while in balloon framing exterior walls and bearing partitions are continuous through the floors. Various advantages are claimed for both types, principally that in platform framing shrinkage is equalized, while in balloon framing it is minimized.

RATIONALIZATION

Rationalization of wood framing practice involves modification of the wood frame to provide a better basis for modern wall and panel board, sheathing board, etc. The traditional wood frame was developed to provide a basis for ribbon sheathing and wood lath. Because such materials needed only to be nailed across the studs and joists, and did not require nailing around all four sides, as do their modern prefabricated substitutes, the traditional wood frame provided adequate support and nailing at all points except at vertical corners, where the introduction of an extra vertical member was all that was needed. Another practice common to both platform and balloon framing which was all right for wood lath but which makes the installation of wall board and particularly panel board more difficult, is the practice of lapping framing members. This practice throws off the modularity of the frame, to which the wall board is precisely sized, by offsetting one member by the thickness of the other.

In practice the wood frame may be easily modified to provide for these new requirements. The first difficulty is best overcome by the introduction of solid bridging at points where cross-nailing is required; the second by avoiding lapped members in platform framing and by the use of stirrups or other metal connectors permitting lined-up framing or by nailing a block of equal thickness to the offset member in balloon framing.

PREFABRICATED FLOORS

Of the various elements of house construction, floors are perhaps the least integrated. Joists, rough flooring, bridging, finish ceiling, building paper, and finish flooring are assembled in a series of separate and widely spaced operations which take up a lot of time on the job, result in a product which is unnecessarily complex and ungainly. And the floor is essentially the simplest of structural elements. A flat plane of uniform thickness and pierced by no opening more complicated than that for the stairway, the floor is about the only sizable part of a house which might conceivably be placed as a single unit. The functional requirements of the floor are rather severe, since it must carry heavy loads over long horizontal spans, something which a prefabricated element should be able to do better than a job assembly.

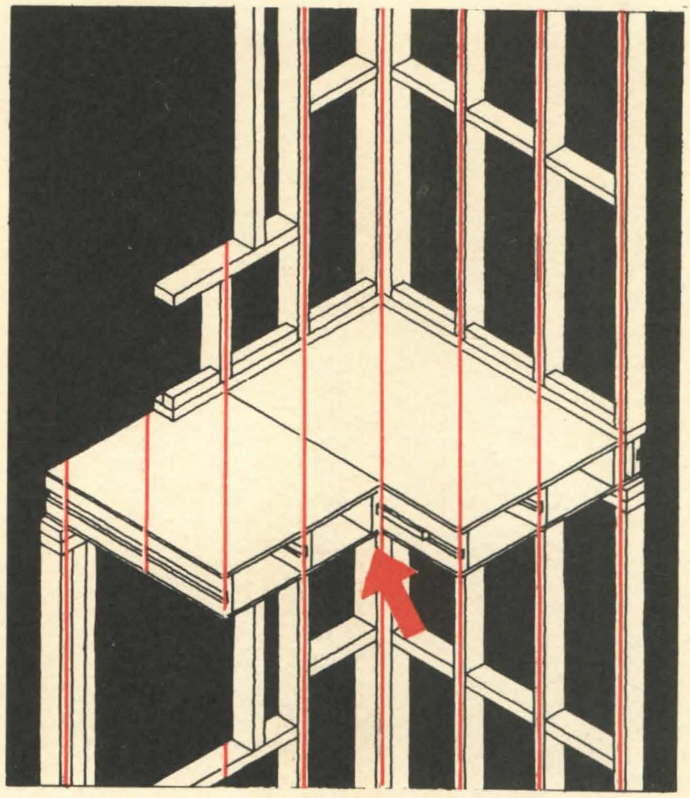
Boxlike, hollow, plywood floor sections of the type developed by the Forest Products Laboratory, are an excellent example of the kind of prefabricated structural element which if separately available and properly sized, might readily be integrated into the technique of conventional construction. Owing to the "stressed covering" principle employed in their construction, the elements have all the advantages which a prefabricated unit should: light weight, minimum material, great strength, and low cost.

Floor panels of this type are usually 2 to 4 ft. wide, with two or three struts corresponding to the joists in ordinary floor construction, and covered with plywood top and bottom. The top covering usually serves as the rough floor and the bottom covering as the finished ceiling. The Forest Products panels were made 4 ft. wide with three 4⅜ in. struts and covered with ⅝ in. plywood on the top side and ⅜ in. plywood on the bottom. Because of the glued construction, the entire box functions as a beam, and although only 5⅜ in. deep overall and with struts 2 ft. on centers is said to be strong enough for spans up to 13 ft. 6 in.

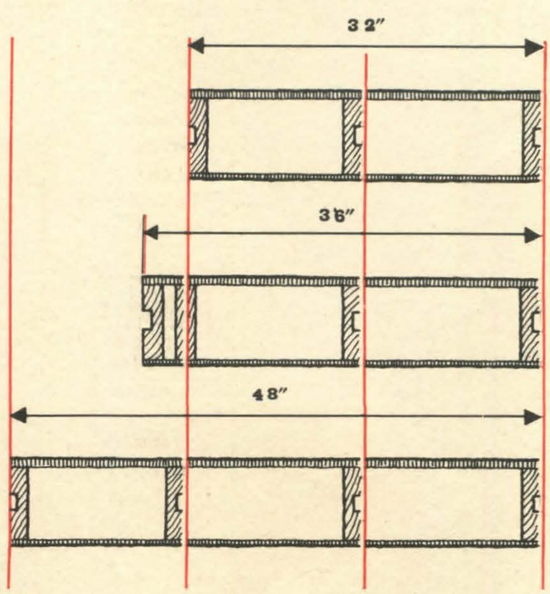
APPLICATION

The use of prefabricated panel floor construction in typical wood frame construction of the platform type is perfectly feasible. All that is necessary is that the panels be made available in appropriate sizes, and in sufficient variety to provide for flexibility in plan, with some provision for pipes and wires.

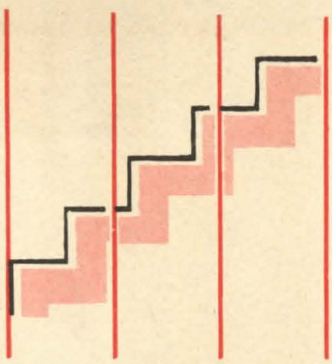
Prefabricated floor panels of the sizes and types illustrated at the right would make a pretty good start in this direction. The basic unit used is 32 in., so as to correspond with regular frame construction. In order to simplify erection, units of 48 in. are also provided. Finally to take care of end wall thickness, a 36 in. unit is included. By the principle of multiple modularity discussed in Part I, combinations of this unit may be made up to any size above 8 ft. which is a multiple of 4 in. Overall lengths may be worked out according to the same basic principles.

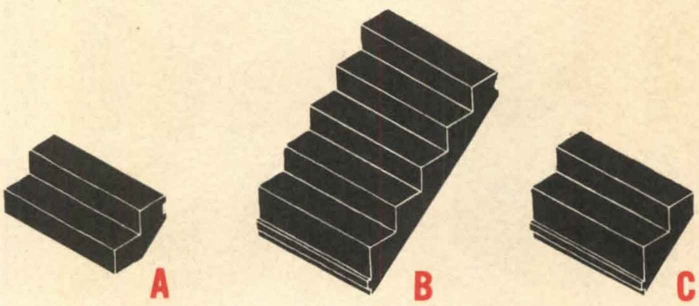


PREFABRICATED FLOORS, OF THE TYPE DEVELOPED BY THE FOREST PRODUCTS LABORATORY, APPLIED TO THE TYPICAL WOOD FRAME HOUSE. ILLUSTRATING HOW THE TECHNIQUE OF PREFABRICATION MAY BE APPLIED TO EVERYDAY HOUSE CONSTRUCTION. ARROW INDICATES CONNECTING SPLINE.

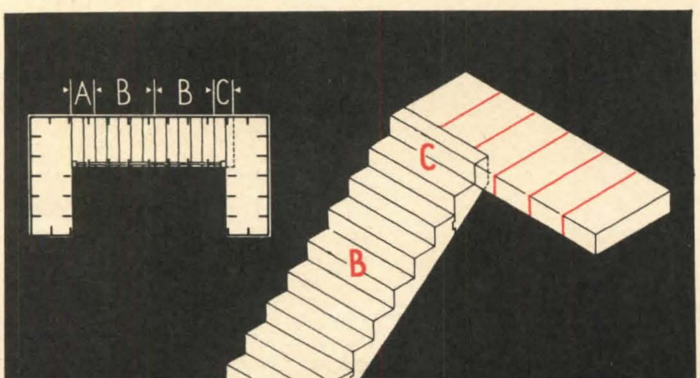


PREFABRICATED FLOORING UNITS, PROPERLY SIZED FOR THE WOOD FRAME HOUSE. THESE UNITS PROVIDE FOR ANY VARIATION IN OVERALL SIZE WHICH IS A MULTIPLE OF 4 IN.





BASIC STAIR UNITS. FROM THESE UNITS, ANY OF THE COMBINATIONS SHOWN ON THIS AND THE OPPOSITE PAGE, AND MANY MORE BESIDES, CAN BE MADE UP.



SIMPLE STRAIGHT-RUN STAIR.

STAIRS

Many a system of modularity and of sectional construction simply collapses when the question of stair construction is reached. There are very good reasons for this, reasons which go deeply into the whole question of the origin of the modular unit. For stairways are the one structural element which must be built precisely to human scale, and not even our smallest unit of measurement, the inch, is adapted to this purpose. Thus stair risers are normally made $7\frac{1}{4}$, $7\frac{1}{2}$, and $7\frac{5}{8}$ in., only the very "easy" stair, with 6 in. risers and 12 in. treads, and the very steep stair, with 8 in. risers and treads, being sized to even multiples of the inch.

The modular unit employed so far in this discussion has been 4 in. and its multiples, 8 and 16 in., for the very good reason that these dimensions are common to almost all forms of present day construction. This unit has an interesting and dual origin. As 4 in., it has probably become the unit of thickness for wood stud and brick walls mostly because it is a third of 1 ft. As 16 in., it has become the center for studs upon which lath is to be nailed because it is a third of 4 ft., which happens to be the length to which cord wood has been cut for a long time, and therefore the length of the wood from which lath were originally split. The fact that 16 in. is a multiple of 4 in. results from the simple fact that four feet is a multiple of one foot or from the fact that both units stem originally from the foot as a unit of measure.

THE STAIR PROBLEM

It is unfortunate that there is no simple mathematical relationship between the modular unit thus arrived at and the proper human dimension for average stairways, but it is not something over which we exercise control. It is simply the result of the fact that no such relationship exists between the unit of measurement, the foot, and the average stair. But in working out a stairway for use with modular planning we are not confronted with the problem of sizing individual steps exactly to conform with the basic unit or module, but simply with working out the practical problem of sizing overall dimensions of the stairway so that it will fit into houses which have been designed on a modular basis. It has already been shown how this can be accomplished so far as the size and number of risers are concerned in relation to standardized floor-to-floor dimensions by making a 9 ft. floor-to-floor dimension with fourteen risers at $7\frac{3}{4}$ in. the basis for such standard stairways. Planning stairways to fit the plan module, however, is not quite so simple as this. For while the number of risers from floor to floor is a simple unitary proposition, in plan nobody wants to be limited to a single straight run of stairs. Instead, it is usually desirable that the stair consist of a combination of runs with various numbers of treads. It is therefore necessary that a series of basic units be worked out, each related to the basic module, from which various combinations can be made up to suit different typical plan conditions.

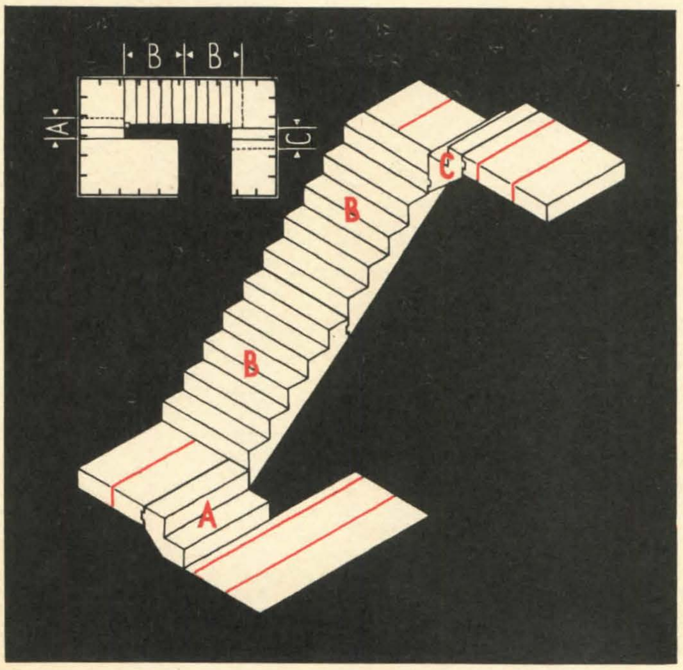
STANDARDIZED PARTS

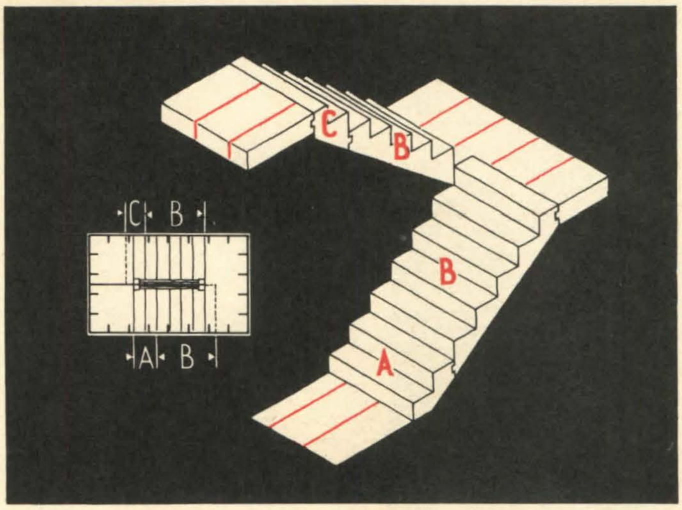
Illustrated on this and the preceding page are such a series of basic stair units, worked out for typical plan conditions and the modular unit common to wood frame, brick veneer, and solid brick construction. The basis of modularity used in the design of these units is 16 in. x 3 (4 ft.), equals five treads, each tread being therefore 9 3/5 in., a good size for small house work. Two such units, placed end to end or parallel, are the foundation of the various combinations. In addition, bottom and top units of two treads each are provided. These units can be placed at the ends of the 4 ft. sections or separately attached to the landings. Together with the standardized landings, it is possible to develop combinations of these units producing every conceivable variation of the stairs in plan, always maintaining over all dimensions in multiples of 16 in., and every variation in the number of risers from 11 to 16, including the standardized floor-to-floor dimension of 8 ft. 4 in., 9 ft. and 9 ft. 8 in.

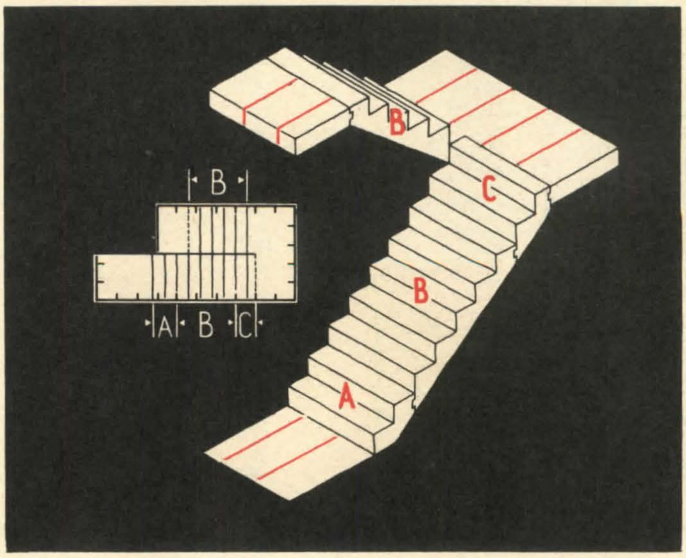
MODULAR STAIRWAY DESIGN

Designing stairways according to these principles is really quite easy, and it should also be possible to work out actual prefabricated stair sections of almost universal application. The system of units shown may be used simply as a basis for designing stairways in such a way that they do not conflict with other aspects of modular planning, as a basis for unit construction and assembly of stairways built from conventional stringer, risers, and treads, or for stair units constructed in much the same way as the plywood floor panels described on the preceding pages. Such stair units, in spite of their limited number, are susceptible to so many variations in combination that freedom in planning would be little restricted by their use. The various combinations illustrated are only a few of the simpler combinations which can be made up without in any way altering the basic units. Architects should experience no difficulty in adapting combinations of the basic units to any conditions likely to arise in practical planning problems.

Prefabricated sections of this type should work particularly well with systems of prefabricated floor construction of various kinds. Obviously, much remains to be done in designing newels, railings, open and closed strings for use with such stairways. Equally obviously, it may turn out that the particular application of the basic module to tread size suggested here may not prove to be the one best adapted to the purpose. But the general principle of modular design plus prefabrication plus interchangeable elements remains the same. Stair design merely presents one of the more complicated, and therefore one of the more interesting aspects of the application of the principle.

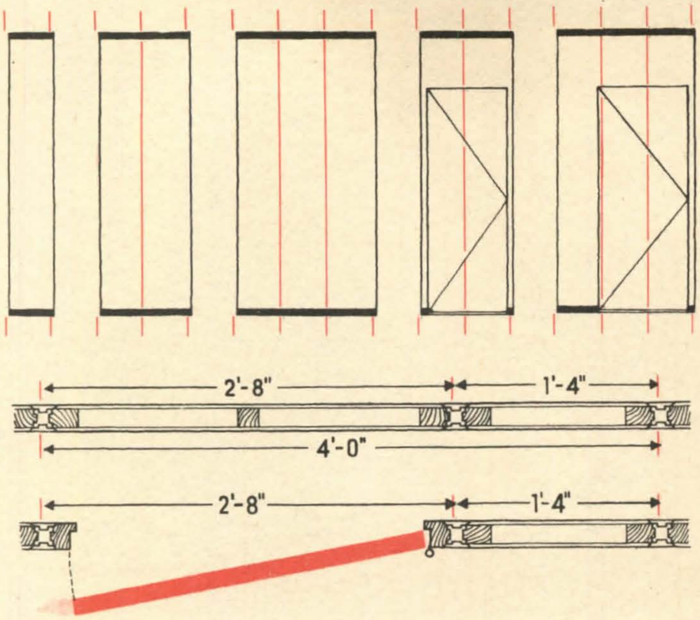




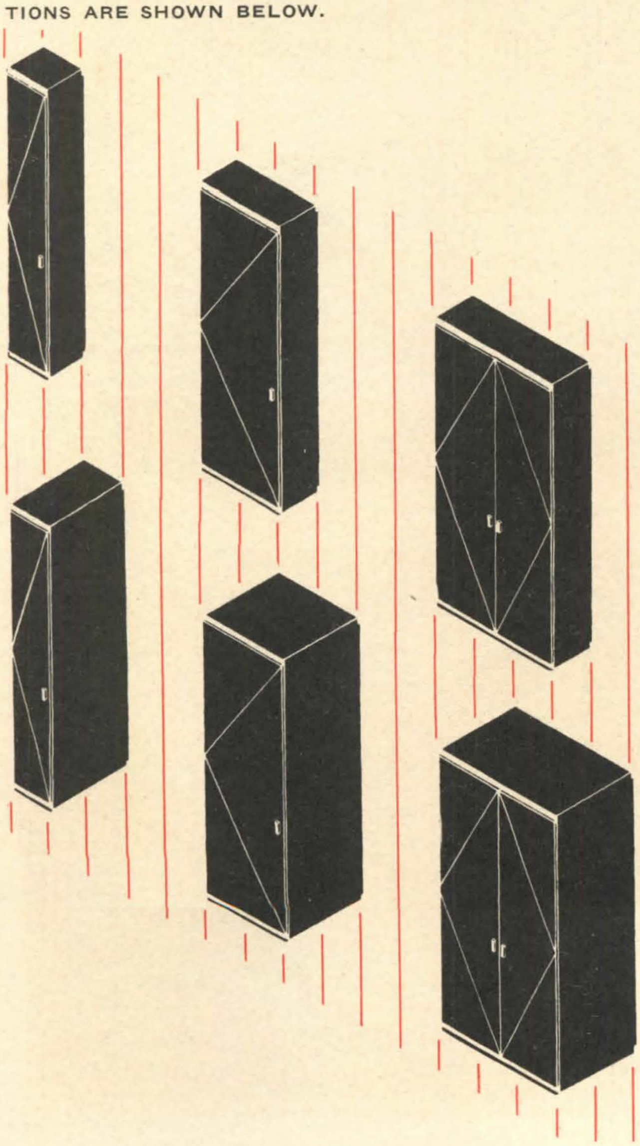


MORE COMPLEX ARRANGEMENTS.

PARTITIONS, CLOSETS, ETC.



BASIC PARTITION UNITS, SIZED ON THE SIXTEEN INCH MODULE. CLOSET UNITS FOR USE WITH THESE PARTITIONS ARE SHOWN BELOW.



Partitions and closets are another element of building construction which should give way easily before the onslaught of prefabrication if attacked separately. Particularly when it comes to building groups of closets is the space required by and the amount of fuss and bother connected with the construction of the conventional partition out of all proportion to what is actually accomplished. Closets built in the regular way are not only wasteful and costly, they are also pretty poor closets compared with their prefabricated counterpart.

Many of the technical problems connected with the construction of prefabricated partitions have been solved in experimental prefabricated houses; but they have been solved in relation to a particular system of prefabrication. All that is needed to make the prefabricated partition go ahead on its own is that such problems be worked out in connection with conventional construction. This shouldn't be very difficult. Not that designing systems of this kind is a snap job. It isn't. But there's nothing about working one out for conventional construction that is in any way harder than working it out for a prefabricated house; if anything, it should be easier. Exactly the same principles apply to sizing units for such a system as those which apply to sizing prefabricated floor sections, except that more variety is probably desirable. It is also necessary that provision for intersecting units be made, a problem which does not arise in connection with the floor panels.

OFFICE PARTITIONS A GUIDE

Most of these problems have long since been solved in one form by the manufacturers of office partitions. It goes without saying that the typical office partition is not adapted to use in the small house—it is too elaborate, too temporary in appearance, and too costly. But many of the principles employed in its design are applicable to the design of prefabricated partitions for the small house. Manufacturers of office partitions have made good use of the principle of multiple modularity which uses relatively large units of somewhat different size to produce a wide variety of overall dimensions in the combination of various units. They have solved the problem of intersecting elements by employing a post between each partition unit of the same thickness as the partitions. They have had no difficulty in making adequate provision for wires, etc., in the partition structure itself. These are principles which must certainly be a part of any system of prefabricated partitions sufficiently flexible for use in the average small house. A technique which remains to be worked out is that to be used in design of prefabricated closets and cabinets employed in conjunction with such partition units. For certainly the greater part of the advantage to be gained from the use of this kind of construction will lie in the possibility of employing completely fitted out closets as the division between bedrooms, fitted cabinets as kitchen walls.

DUCTS AND WIRES

The commonest objection to the use of prefabricated structural elements in conventional construction is that provision for ducts, wires, pipes, etc., is so much more difficult in prefabricated than in conventional construction. While it can hardly be said that provision for ducts and wires is a simple matter in conventional construction, involving, as it does, cutting into the structural frame of the floors and walls, it is quite true that there are satisfactory methods of providing for such parts in construction of this kind. Equally, it is true that satisfactory provision for wires and ducts is a necessary part of any sectional construction.

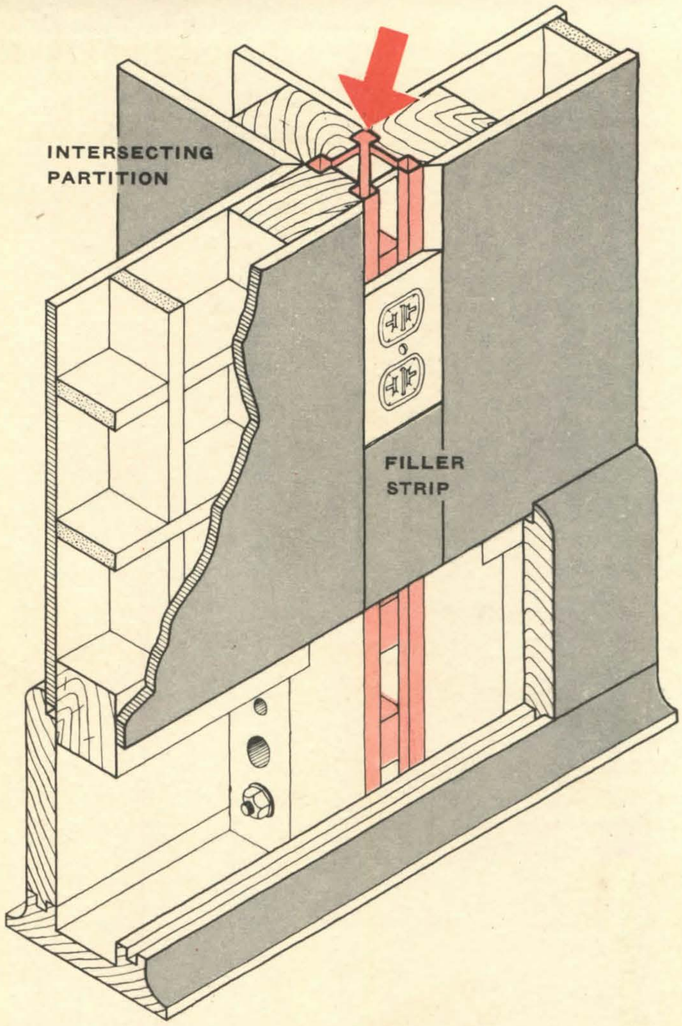
In conjunction with prefabricated partitions of the type described on the preceding page, provision for ducts can probably best be made by developing box-like modular sections similar to the closet and cabinet sections, to enclose such ducts and pipes. Systems of prefabricated modular duct work, worked out for use in wood frame construction and therefore adapted to use with the 4, 8, 16 in. modular system, have recently been made available.

PROVISION FOR WIRING

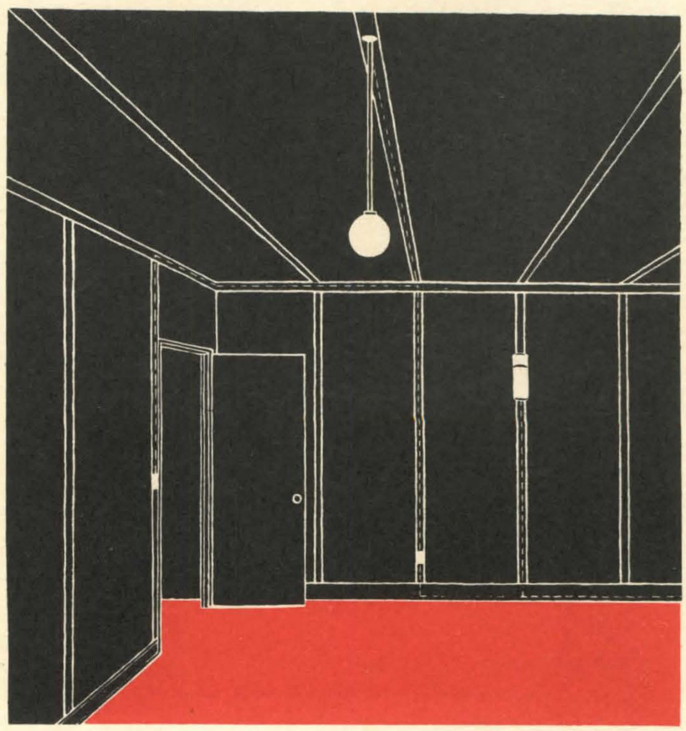
One way of providing for electric wiring is shown on this page. This method takes advantage of the necessity for a connecting post between individual partition sections by providing therein a raceway for wires. A free space for wiring at the top, bottom, and juncture of each partition section is thus provided and the necessity for conduit eliminated, making the job of wiring the partitions at least as easy as that of wiring partitions constructed in the conventional way. This is substantially the arrangement which has long been employed with movable office partitions. It has the additional advantage over ordinary methods that repairs and additions to the wiring system can be made without disturbing the partitions, and that wiring can be removed or relocated when it is desired to take down or move a partition.

PLUMBING

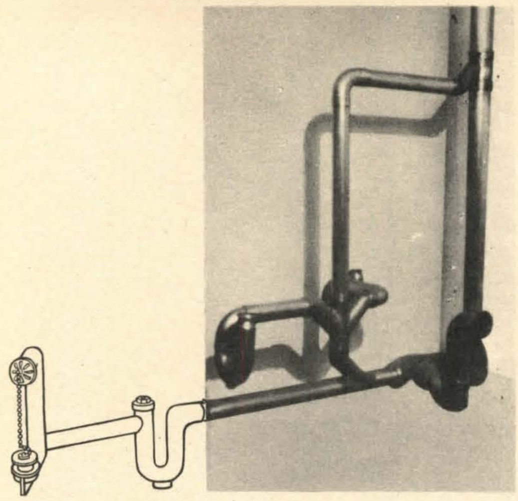
In a thoroughly integrated house, plumbing supply and waste lines should be almost entirely concentrated in one or two pipe spaces. Isolated pipes can be provided for in the same way as ductwork, by the provision of box-like enclosures sized according to the modular system. Provision for heating pipes is somewhat more difficult, since they generally occur as isolated risers, one per vertical group of radiators, and ordinarily require radiator run-outs in the floor. Special provision in the partition system for heating pipes spaces in the exterior corners of each room would probably have to be made for use with this kind of heating system. Where wall-hung radiators or convectors are used, or radiator cabinets provided, provision for run-outs could be provided in the exterior wall or in the cabinet itself.



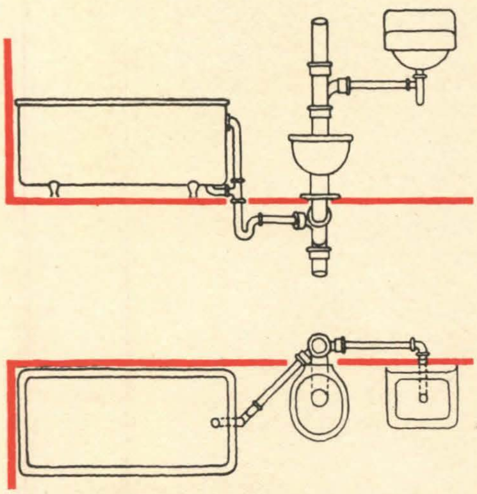
JUNCTURE OF PREFABRICATED PARTITIONS, SHOWING HOW PROVISION FOR WIRING MAY BE MADE IN THE BASE AND CONNECTING POSTS. DRAWING BELOW SHOWS THE COMPLETE FLEXIBILITY THUS ACHIEVED.



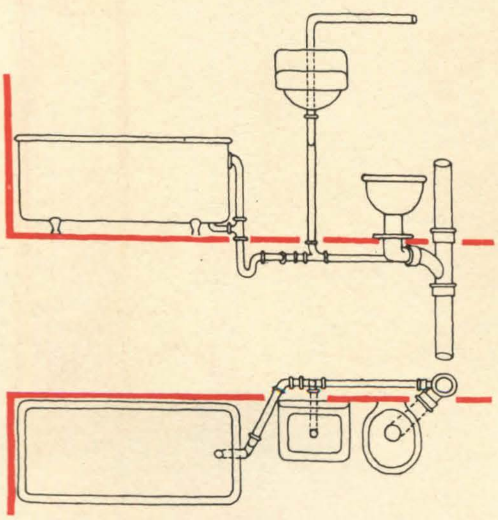
PREFABRICATED PLUMBING



MOTOHOME'S PLUMBING, ONE OF THE FIRST SYSTEMS OF PREFABRICATED PIPING ACTUALLY TO BE WORKED OUT IN PRACTICE.



PLUMBING SET-UP, ENTIRELY WITHOUT SEPARATE VENTS, DEVELOPED AND TESTED BY THE U. S. BUREAU OF STANDARDS.



ALTERNATE SET-UP, SHOWING HOW LOCATION OF THE WASH BOWL BETWEEN THE TOILET AND THE TUB CALLS FOR A SEPARATE VENT.

Widely recognized as the field in which the advantages of integration and shop fabrication may be most readily realized, plumbing is perhaps the most complicated and unnecessarily involved of present-day building practices. In spite of this, little actual progress has been made in this direction. The tendency is to blame the lack of progress on arbitrary code requirements and short-sighted restrictions imposed by the plumbing trade. There is a lot to justify this point of view. Recent studies have shown that many of the requirements of most plumbing codes, particularly those regulating the sizes and materials of soil and vent lines, are unnecessarily stringent. And there have been many instances where the installation of simplified plumbing fittings has been blocked by the plumbing trade.

FIXTURE LOCATION

But there is still another factor which tends to complicate plumbing practice, one which is within the control of the individual architect. This is the question of fixture location and arrangement. For it is a fact that even with simplified plumbing codes and the co-operation of the plumbing trade, the arrangement of fixtures used in many cases, and especially in the case of the typical small house, would result in pretty complicated piping. This is because architects seldom have due regard for the piping when locating fixtures in small house work.

It is true that of late more attention has been paid to the location of kitchen and bathroom units over or adjacent to one another—a greater effort made to group fixtures on a single wall. But this is still not a thing which is taken very seriously by the average architect. Nor has the importance of fixture arrangement in simplified plumbing practice been generally appreciated.

This latter point was particularly well illustrated by a study of minimum plumbing requirements made by the U.S. Bureau of Standards. Study of a stack-vented bathroom group of typical fixtures (diagram A, at left—tub, toilet, and basin in this order on one wall), showed that it was possible to obtain safe and efficient drainage system for a single floor, or for the top floor in an installation of more than one floor, without separately back-venting any of the fixtures. With arrangement B (tub, *basin*, toilet), however, it was found necessary to vent the basin separately.

SIMPLIFIED LAYOUT

The importance of this in prefabricated plumbing is illustrated by the contrast between Motohome's prefabricated plumbing unit (upper left hand corner of this page) and the plumbing unit shown in the upper right hand corner of the page following. The Motohome unit uses fixture arrangement B, with the basin in the middle. The unit shown opposite employs arrangement A, with the toilet in the middle. This unit is obviously simpler and more compact than the unit used in the Motohome, but the advantage of this fixture arrangement does not end there. For while the Motohome unit does not provide a separate vent for the tub, would therefore not be legal everywhere, in the arrangement with the toilet in the middle separate vents for each fixture are so easily provided that the issue of whether or not they are necessary is hardly one worth arguing about.

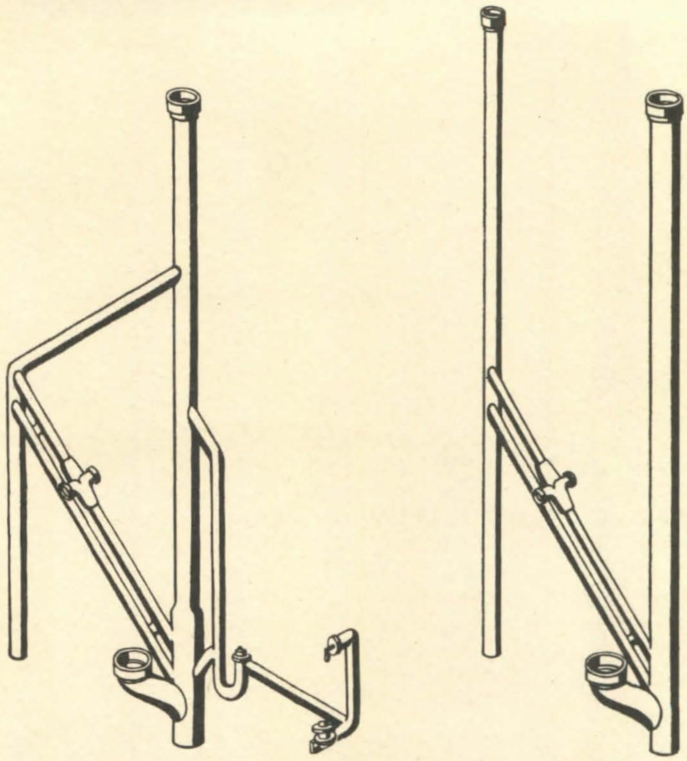
BASIC DESIGNS

Besides fulfilling the requirements of most plumbing codes, these prefabricated plumbing units satisfy nearly all of the conditions likely to arise in small house work. The primary unit may be used for all of the fixtures of the typical bungalow: tub, toilet, basin, and combined kitchen sink and laundry tray, or for the typical second floor bathroom, with or without an additional washbowl in the adjoining space. The secondary unit may be used for first floor sink or combination sink and laundry tray, first floor toilet and basin, with or without fixtures in the basement. Fixture arrangement is naturally dependent upon the standardized piping layout, and fixtures must occur over one another in plan if a simple plumbing system is desired. With right and left hand units of this kind, first floor fixtures may be placed on one side of the partition pipe space, second floor fixtures on the other side. It is interesting that where complete bathrooms occur over one another in tiers, as in apartment house work, another arrangement of the fixtures is called for. This is because the necessity for venting so many fixtures through the upper unit makes a system with a continuous vent pipe desirable, and this type of piping works better with the fixtures placed with the basin between the toilet and bath.

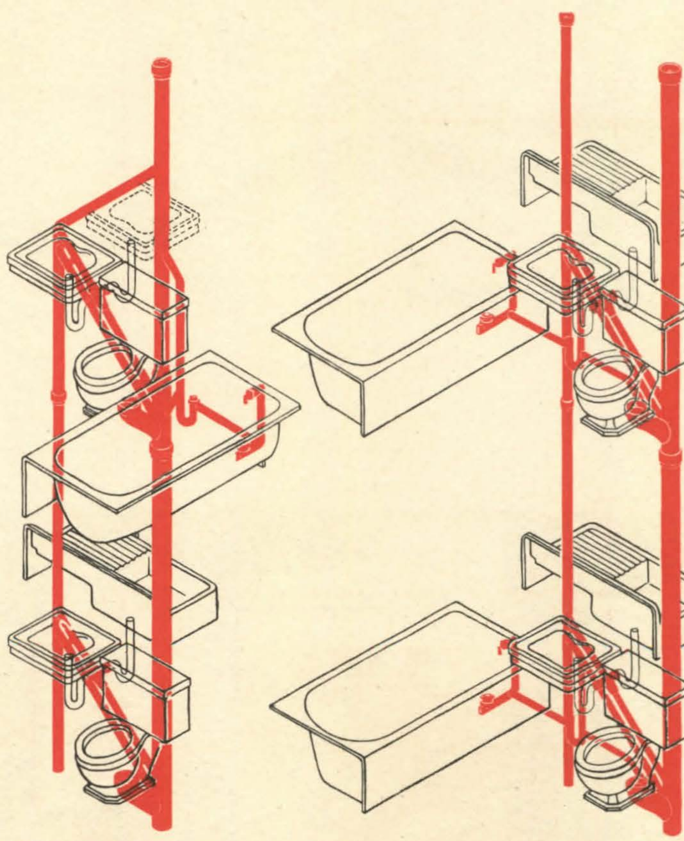
While prefabricated plumbing units are not at the present time available, the fixture arrangements which the design of such units suggests will result in simplification of the piping and considerable savings if employed with regular piping and fittings. Where crowfoot fittings may be used, such savings are increased. And where codes permit, the simplified piping layout worked out and tested by the Bureau of Standards with the center toilet arrangement may be employed with confidence and the assurance that it will save still more.

WATER SUPPLY

Supply piping does not similarly affect arrangement. So long as the fixtures are fairly close together and a minimum of pipe used, there is little to be saved by any particular arrangement. One way to save something in small house work, and particularly in bungalows, is to locate the hot water tank as near the fixtures as possible in order to cut down on the size of the hot water system. This saves pipe and hot water as well, since less water cools off in the pipes. Combination valves, which result in some saving in time on the job by cutting down on the number of connections, are available, such as four valve groups for tub and shower supply, two valve groups for the tub alone. Another saving can be effected by using one set of cut-off valves for all fixtures in a given space.

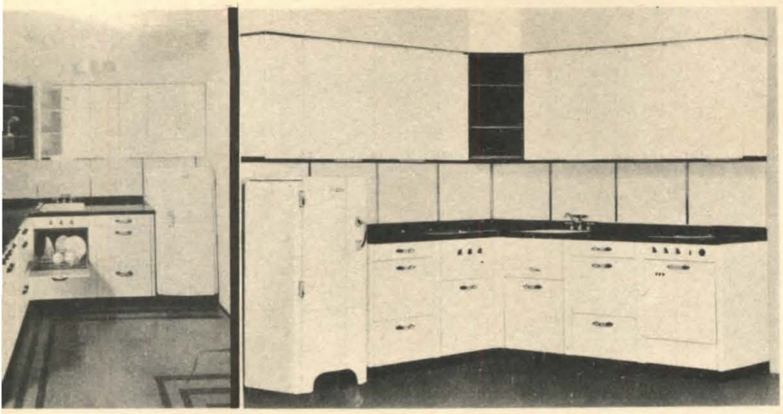


PRIMARY AND SECONDARY PLUMBING UNITS, COMBINATIONS OF WHICH ARE CAPABLE OF SATISFYING ANY GROUPING OF FIXTURES LIKELY TO BE ENCOUNTERED IN SMALL HOUSE WORK, PROVIDING ONLY THAT THE FIXTURES ARE PROPERLY ARRANGED.



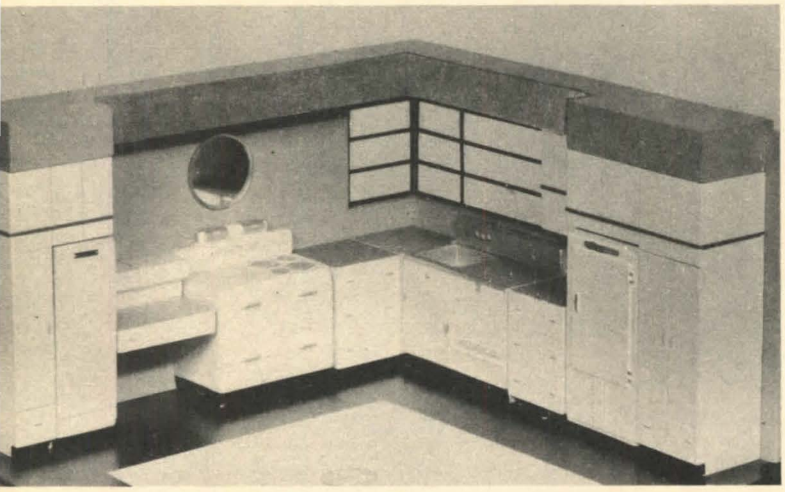
APPLICATION OF PREFABRICATED UNITS. AT THE LEFT A COMBINATION OF THE PRIMARY AND SECONDARY UNITS SHOWN ABOVE, AT THE RIGHT A COMBINATION OF MULTI-FLOOR UNITS, THE TYPE CALLED FOR WHERE BATHROOMS OCCUR ONE ABOVE THE OTHER.

INTEGRATED EQUIPMENT



GENERAL ELECTRIC KITCHEN

Today it is commonplace to contrast the design of housing equipment, particularly kitchen and bathroom equipment, with the design of the structural shell of the house. It is often pointed out that the design of such equipment is much more attune with the machine age than the design of the house itself. The reason for this contrast is, however, seldom made adequately clear. This is because of a tendency to regard the difference as purely and simply one of design, and to ignore the fact that the method of design used is in each case merely a visible reflection of the mode of production employed. And the contrast in the mode of production of housing equipment and the structural shell is even more striking than the contrast in design. Housing equipment today is produced by modern mass production methods with belt line technique. As a result, manufacturers of housing equipment offer more utility, efficiency, durability, and beauty per building dollar than any other section of the building industry. The modern range, refrigerator, furnace, and bathroom fixture are products in every way comparable to the modern automobile and streamlined train.

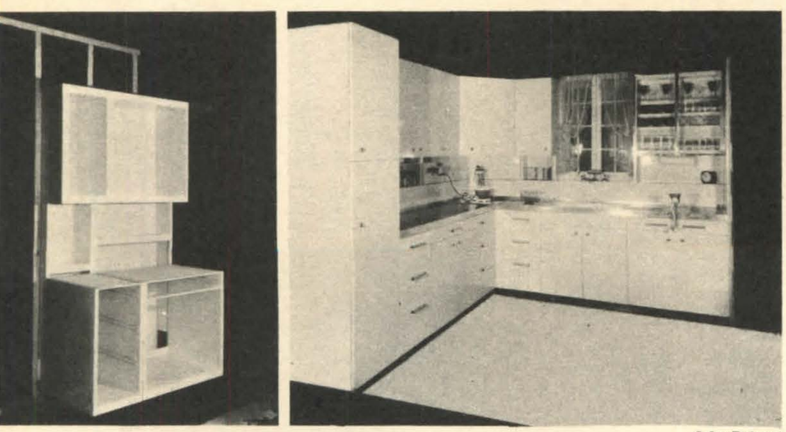


WESTINGHOUSE KITCHEN

PRESENT TREND

The development of such equipment was until very recently a predominantly unit-by-unit development. But as the development of individual units has become more and more perfect, the contrast between individual units and their effect in combination has become steadily more evident. The inevitable result of this process has been the introduction of integrated equipment.

Integrated equipment is, first and foremost, equipment so designed that the individual units work well with units likely to be combined with them. Thus a kitchen range, sink, and refrigerator designed to be used with one another constitute integrated equipment. But the process does not stop at this point; nor can it. Nonmechanical units, such as storage cabinets and working surfaces, must also be designed so as to fit in with the mechanical equipment. And finally, in some of the lines now available, structural parts of the building itself become an essential part of the integrated system. ★



John Beinert

ARCODE KITCHEN

Only in this way can the advantages of such integration fully be realized. In the case of the Arcode kitchen and bathroom units illustrated at the left, for instance, it has been found necessary to include the structural wall as a part of the cabinet structure, in order that space may be more efficiently utilized and a foundation which will properly maintain the alignment of the individual units be provided. This structural wall unit, an integral part of the cabinets and equipment, is more than strong enough to act as a bearing partition in the average house; and it provides space for, and access to, the pipes and wires necessary for the connection of the fixtures.

★ A recent and significant example of integration of equipment with construction is Kelvin Home package air conditioning.

PREFABRICATED BATHROOM

There is considerable evidence that this process of integration of mechanical equipment and structural parts may become an exceedingly important part of the general trend toward prefabrication not of the house as a unit but of its individual structural elements. Logical next step in integrated equipment is the entirely prefabricated bathroom recently developed by Buckminster Fuller of "Dymaxion" fame. Here all of the typical bathroom fixtures have been combined in a single unit which includes floor, walls, and ceiling in a single cubical cabinet. This cabinet may be installed anywhere so long as sufficient space and proper soil, vent and supply pipes are available.

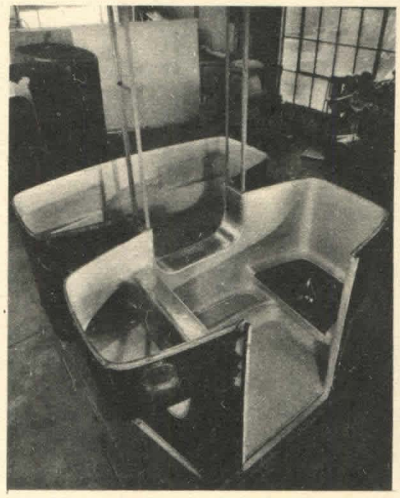
A perfected bathroom unit of this kind calls for integration with the balance of the house structure just as obviously as the perfected range or sink called for the integrated kitchen. And technical developments in housing equipment of this kind are just as inevitable as the fact that next year's cars will have this year's models beat forty ways. This is bound to affect the structural shell of the house.

EFFECT ON DESIGN

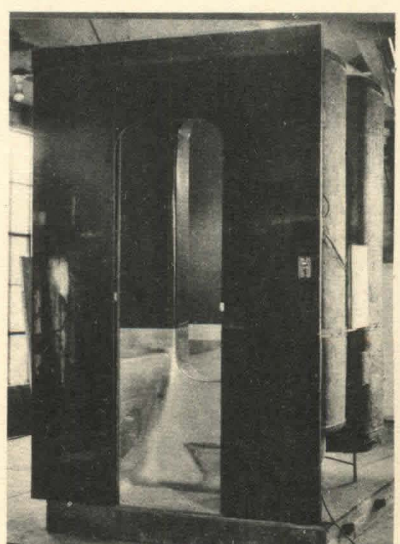
An idea of what the effect will be can be obtained from examples like Fuller's bathroom. The first thing to be noted in this connection is the way in which the fixtures merge with, and become a part of, the walls themselves. Second is the fact that rather than a series of intersecting planes, the walls and ceiling of the unit consist almost entirely of curves. There are very practical reasons for both of these things. Besides the fact that the interior of the bathroom is thus made more attractive and easier to clean, the number and nature of joints required is reduced and simplified, and the necessity for reenforcing the metal plates which make up the walls eliminated, just as in the automobile top stamped out of a single piece of steel. We may expect that as machine technique makes its way into the housing field the old rectilinear forms will gradually be replaced by sweeping curves; integrated equipment, as the point of first application of this technique, points the way to things to come.

The saving in space which may be expected to result from integration of equipment is also exemplified by the Fuller bathroom, although perhaps it has been carried too far in this case. In any event the unit shows that considerable reduction of the sizes now generally considered minimum is possible, and at the same time facilities for storage, etc., may be increased rather than reduced, with integrated equipment. The design is also remarkable for the way in which conventional concepts of bathroom planning have been successfully disregarded, as in the shower enclosure created by the partition between the tub and lavatory unit, in which the walls and the side of the tub merge, and the latter becomes an integral part of the structural and plumbing armature of the unit.

Photos Bernard Hoffman



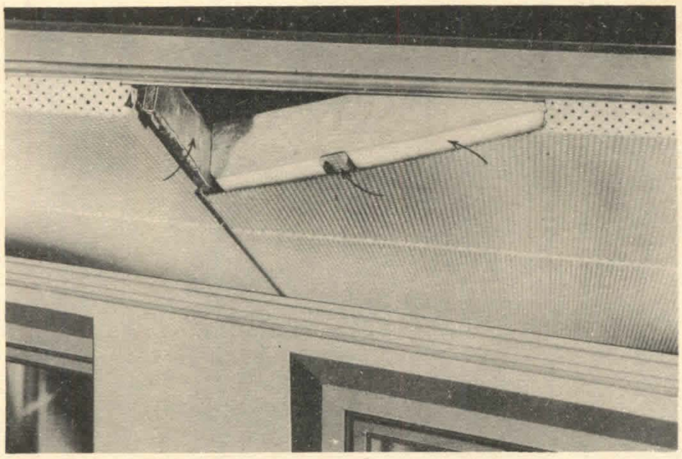
ONE-PIECE PREFABRICATED BATH ROOM, DEVELOPED BY BUCKMINSTER FULLER FOR THE PHELPS-DODGE RESEARCH LABORATORIES.



. . . PICTURES SHOW VARIOUS STAGES IN ASSEMBLY, AND THE COMPLETED BATHROOM.

3. MULTI-PURPOSE PARTS

ONE PLUS ONE EQUALS ONE

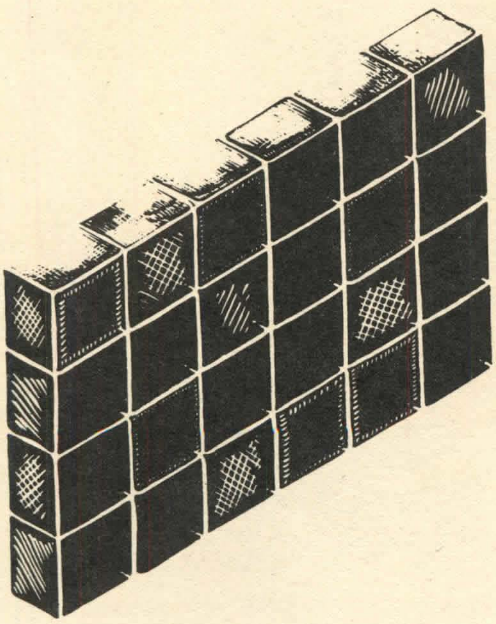


BURGESS ACOUSTI-VENT CEILING

is the formula for another kind of integration which is increasingly a factor of importance in the building industry: integration of function in multi-purpose parts. Thus structural sheathing and insulation are combined in insulating board, the water heater becomes an integral part of the boiler, served by the same burner. Clearly, this is a way in which the number of separate parts of the house can be reduced, their assembly simplified. Integration of this kind is based upon an accurate analysis of all of the functions of a structural element or a mechanical part coupled with a selection of materials and design resulting in a part which performs as many of the required functions as possible.

CEILINGS

This process may be illustrated by a current example, the Burgess Acousti-Vent ceiling. Analysis of the functional requirements of the typical restaurant or large office ceiling discloses the fact that such a ceiling has three distinct functions. The first of these is to enclose the top of the office with a sound absorbing material to reduce noise reflection. Second is to reflect light. Third is to cover and enclose a system for air distribution. In the Acousti-Vent ceiling construction all three of these functions are performed. Perforated sheets, backed up with sound absorbing material, are employed as the ceiling surface and simultaneously utilized to enclose a plenum chamber for the circulation of air and as a means of introducing air into the room. While light reflection is reduced somewhat by the perforations, 90 per cent of the ceiling area remains a good light reflector. Compared with other structural systems including all of these functions, this system is a relatively simple and economical one.



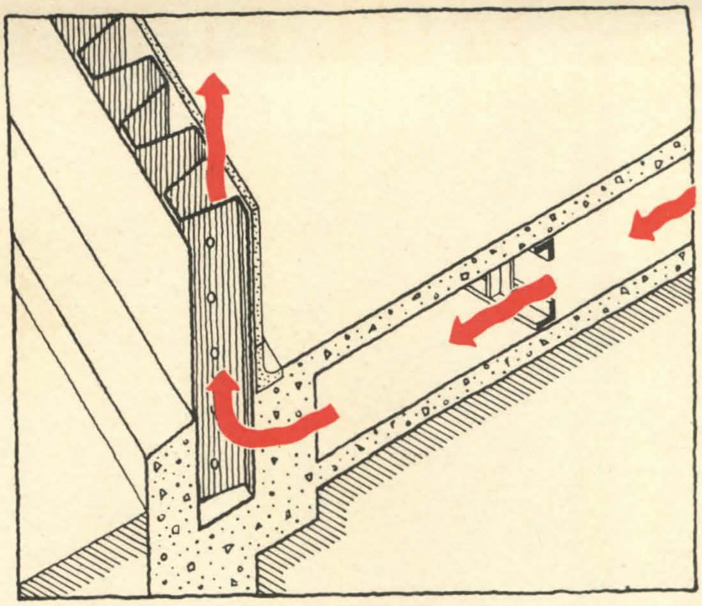
GLASS MASONRY IS A FORM OF MULTI-PURPOSE PART.

WALLS

In the same way, glass masonry units may be considered an example of functional integration applied to the exterior wall. In a sense, glass blocks combine the functions of the exterior wall with those of the window in the same unit. They perform most of the functions of the wall, including weather protection, insulation, and support of floors, with the principal function of windows, that of admitting light. The fact that they are not transparent and make *no provision* for ventilation merely shows that in this construction the process is incomplete, while meanwhile the necessity for providing for ventilation in the exterior wall is disappearing. A glass masonry wall which includes transparent units constitutes a pretty thoroughly integrated unit from a functional standpoint, although from a structural point of view it is not particularly advanced.

FLOORS

Similarly, there are indications of the same process of integration of function in certain floor constructions currently being developed. Best example of this is the use of floors (as well as walls, partitions, and ceilings) as low temperature radiators for house heating. In one such system installed in a single story house, a space is provided beneath the floor into which hot air is introduced from a hot air furnace. Heat from this air is taken up by the floor and transferred by both radiation and convection into the rooms above, the floor being maintained at a temperature of about 70° F. Having given up most of its heat to the floor, the air is permitted to escape through the walls, where it acts primarily as an insulating blanket. Applicable only in a mild climate, this method of heating is nevertheless indicative of the trend toward functional integration of structural parts. In the same way, partitions, outside walls, and ceilings have been used for heating purposes as low temperature radiators in the various systems of so-called "panel" heating currently being developed.

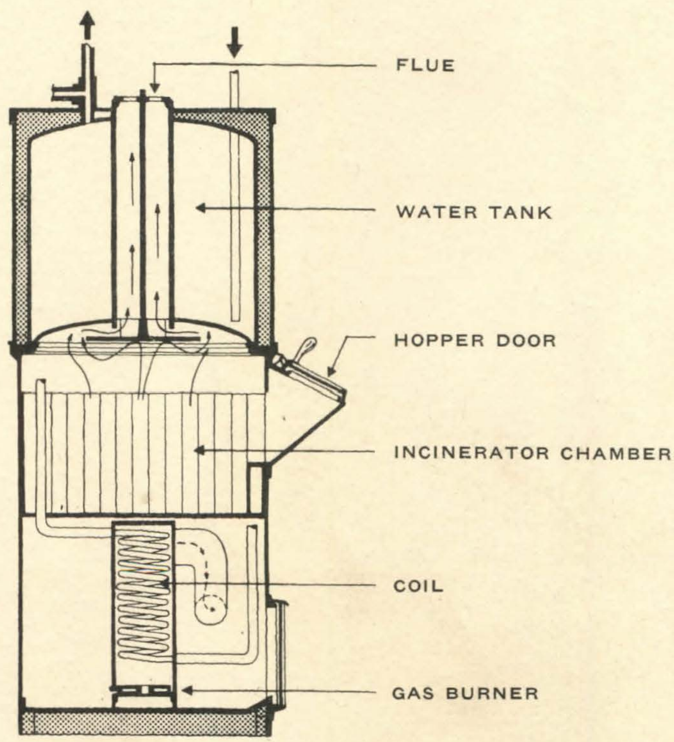


INTEGRATED FLOOR CONSTRUCTION, IN WHICH THE FLOOR IS USED AS A SOURCE OF LOW TEMPERATURE RADIATION.

EQUIPMENT

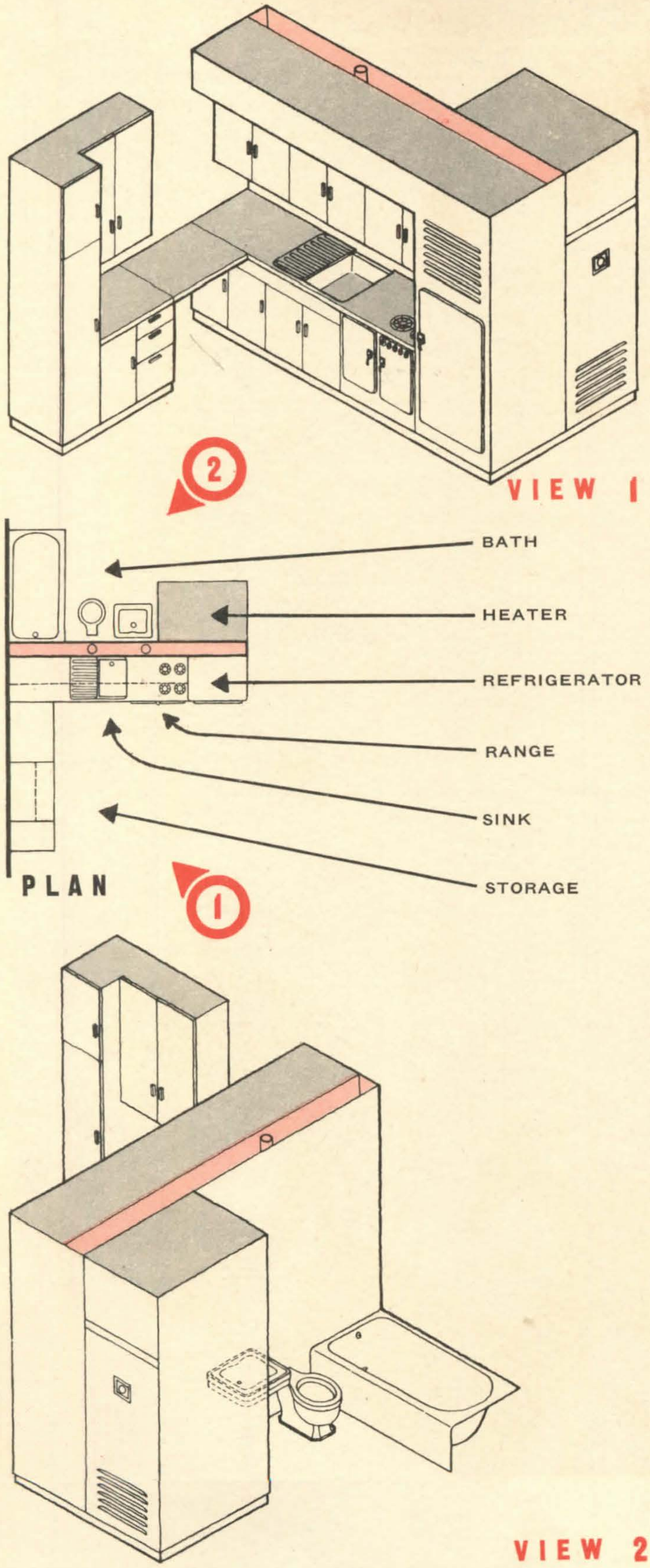
By far the most important sort of integration of the "one plus one equals one" type going on at the present time is, however, integrated equipment. Combination heating plants and hot water heaters, combination hot water heaters and incinerators, or combinations of all three, compressor units used for both domestic refrigeration and summer cooling, and kitchen ranges used for house heating as well as cooking and hot water heating currently exemplify this tendency. Less generally known examples of the same sort of thing include the use of cooling equipment for heating purposes (by pumping heat *out* of the outside air and *into* the building during cold weather with the same apparatus used to pump heat out of the air in the building into the outside air during the summer time), and the use of Diesel power plants for heating in addition to their normal function of generating electricity.

Clearly, this is a process which is only just beginning, since it is only recently that such items have been individually mechanically perfected. It is also a process which goes through two successive stages; the first stage being the one in which various mechanical units are designed so as to work properly with one another, and the second stage the one in which they are more or less incorporated into a single production unit. And it is seemingly impossible to arrest the process at the first stage, since merely considering two such mechanical units in juxtaposition invariably suggests improvements which would result if the two were produced together. Thus integrated kitchen equipment, which starts merely as a redesign of typical kitchen fixtures for better use together, invariably soon involves the incorporation in the various units of parts formerly belonging to other and separate units; the sink, for example, becomes more of a part of a cabinet assembly and less of an item in itself. It is a process which contributes immeasurably to the integration of building as a whole.



COMBINATION WATER HEATER AND INCINERATOR, IN WHICH THE SAME GAS BURNER IS USED FOR HEATING WATER AND FIRING REFUSE, AND WHICH UTILIZES THE HEAT DEVELOPED BY INCINERATION TO HEAT WATER IN THE TANK.

INTEGRATED "POWER PLANT"



MECHANICAL UNIT FOR THE ONE-STORY HOUSE OR SMALL APARTMENT. COMBINES ALL OF THE MECHANICAL EQUIPMENT OF THE MINIMUM HOUSE IN A SINGLE PRODUCTION UNIT.

The development of prefabricated kitchens, prefabricated bathrooms, and integrated equipment suggests another possibility—the development of a completely integrated and prefabricated mechanical "power plant" for the modern house. Such a unit might include in one housing all the bathroom and kitchen fixtures for a small, single story house as well as the water heater, heater, ventilating equipment, etc., and would then require only soil and vent lines, water, gas, and electrical connections to be ready for use. Not necessarily made in a single piece, the power plant would nevertheless be designed for quick and easy assembly of its several parts, in much the same way as the two parts of the Fuller bathroom unit are put together.

This is certainly one of the best ways in which to introduce the automobile industry's production technique into the building field. As a production problem, such a unit would be no more difficult than the modern car—if anything less so. The power plant would be no larger, no heavier, no more complex, and probably no more costly than a low-priced automobile. It would introduce belt-line efficiency and low costs into the production of building equipment and at the same time result in improved quality, better coordination of the various parts, and space saving all along the line.

POWER PLANT DESIGN

The illustrations on the left are intended merely to suggest a possible form which such a power plant might take if one were developed at the present time. The arrangement shown is practicable only for plans in which the kitchen and bathroom are arranged back-to-back, and on the same floor. It is thus applicable only to the one-story house and apartment. Probably a more flexible unit would have to be worked out for the more typical two-story house, one in which the various elements might be arranged in a series of different ways, with the bathroom fixtures over the kitchen. But first demand for such a unit would most likely be in the field of modernization work, such as subdividing city houses into separate apartments, would therefore call for the development of a unit of the type illustrated.

It is also true that mass-production technique would almost certainly call for modification of the design in much the same way that bathroom design and the design of bathroom fixtures have been modified in the Fuller prefabricated bathroom. It is almost impossible to predict the modifications of form which such production methods would dictate, except that they would be roughly analogous to the changes which have taken place in the automobile since its inception and are taking place in a thousand other fields today.

The design illustrated, however, gives an accurate picture of what such a unit, in a rudimentary form, would be like. Moreover, it represents an assembled power plant which could be put together today from parts immediately available.

PLANNING FOR POWER PLANTS

One of the main reasons why no such power plant has so far been developed is a hesitancy on the part of equipment manufacturers to appear to dictate inflexible plan arrangements. In spite of the obvious advantages of the back-to-back arrangements of kitchen and bathroom and close coupling of the water heater and house heater, manufacturers have limited their contribution to the development of separate bathroom and kitchen setups. In this situation it is up to architects to start the ball rolling by planning for close coupled mechanical equipment.

There is a well-defined tendency toward this kind of planning. Experience on large-scale housing developments has shown the importance of a due regard for this factor in working out small house and apartment plans, has shown too that the restriction of architectural ingenuity imposed by consideration of such mechanical factors is not onerous. And this experience with large-scale work is beginning to be reflected in small house plans.

Tangible benefits accrue to the architect who makes consideration of mechanical convenience an integral part of his planning technique. Cost saving is only one of these. There is also saving in space, simplification of mechanical layout and specifications, and the opportunity to employ structural systems and methods which cannot ordinarily be used because they make no provision for miscellaneous and scattered pipes and ducts.

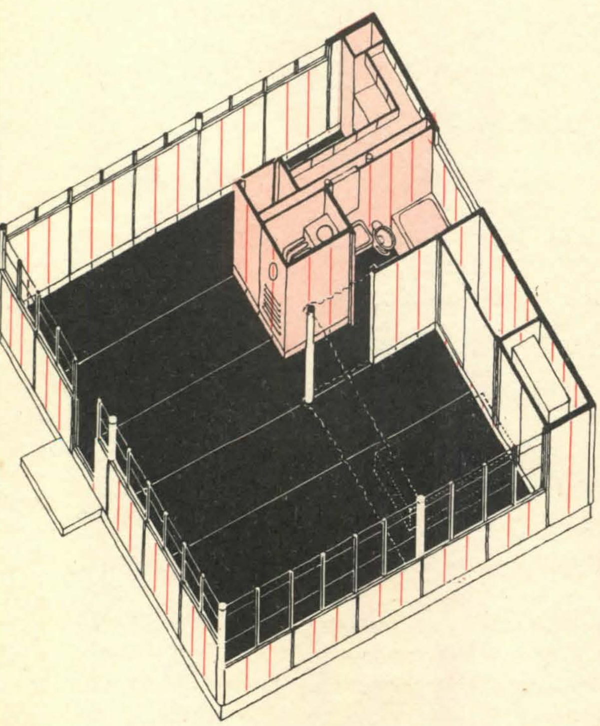
POWER PLANT ASSEMBLY

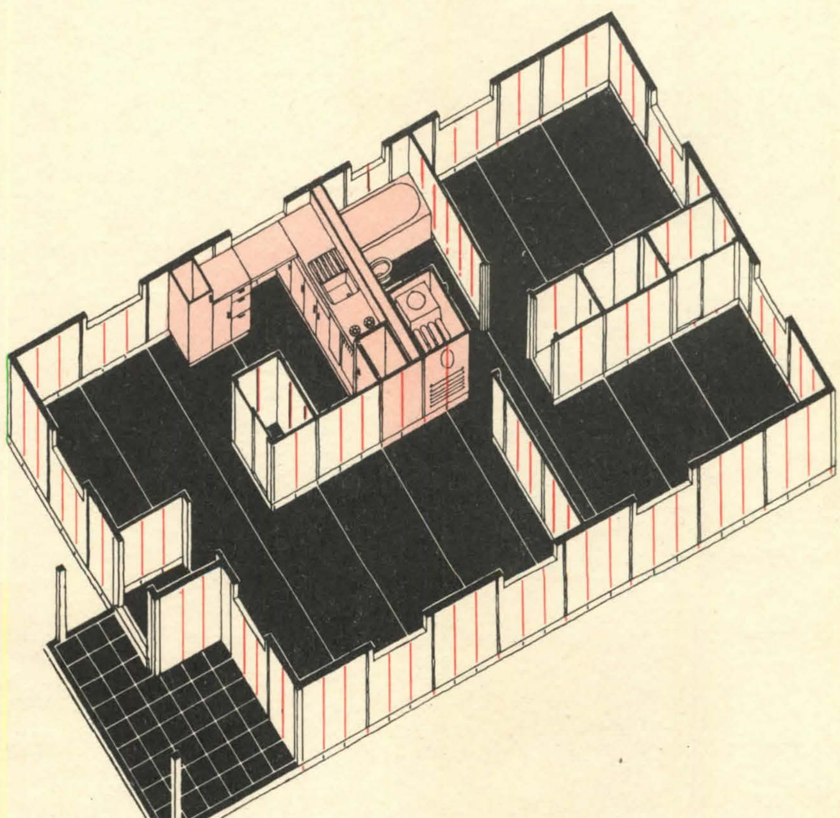
An integrated power plant of the type herein described is within the immediate reach of alert architects at the present time. The design shown on the preceding page could, for instance, be assembled from some of the standard kitchen and bathroom units described in the section on interchangeable elements. Such an assembly would probably be no more costly, and would certainly in many ways be much better, than the equipment now used in the average small home.

Individual architects can easily work out assemblies of this kind, incorporating as many items of equipment as seem desirable for a particular job, and arranging these items in a manner appropriate to their own designs. All of the separate items for such an assembly are available, worked out and finished, awaiting only the hand of an expert designer to combine them in a single integrated unit. Such a unit would fit into conventional house construction, might well become a prime sales point for an otherwise undistinguished small house.

REPRESENTATIVE PLANS

Two sample plans incorporating the integrated power plant idea are shown below. The plan at the right is for a conventional five-room bungalow providing minimum housing facilities for the average family. The design at the left is for a week-end house. In each of these plans the mechanical equipment has been successfully concentrated in a single power plant unit.





WEEK-END HOUSE AND SMALL BUNGALOW, EMPLOYING THE INTEGRATED "POWER PLANT."

THE INTEGRATED HOUSE
WHO DOES WHAT ABOUT IT?

THE ARCHITECT

must start the whole thing off by making his designs an integrating medium for the entire industry. He must develop a rational method of modular planning which will enable manufacturers of building supplies and equipment properly to size their products, encourage the development of interchangeable elements and multi-purpose parts by making full use of them as they appear.

THE MANUFACTURER

must continue the improvement of his products along lines which will result in greater interchangeability and functional integration. In order to do this he must carry on research into current building and architectural practice as well as product research. He must publicize what he is doing for integration so that architects and builders can take advantage of these improvements.

THE BANKER

must encourage integration by favoring loans on new property evidencing the integrated method. He may do this because integration not only cuts costs and gives more for the money, but also constitutes protection against early obsolescence, makes it possible for the owner to keep his property continually up to date and to incorporate improvements as they are developed.

THE REALTOR

must sell integration to the home-buying public. He must study its advantages, learn to express them in terms which the public can understand. He must sell function as well as features, good architecture instead of bad, long-term value instead of short-term price, quality that is underneath as well as things that can be seen on the surface.

COMMENT

To carry the Integrated House from a two dimensional approach into three dimensional fact calls for a new degree of collaboration between designers, industrialists, realtors, and financiers. In order to pre-test the validity of this study, copies were submitted in advance of publication to a number of men who in recent years have made the small house problem a major interest. Their comments are published below. The Editors of THE FORUM *invite others to contribute their reactions, favorable or otherwise, to this discussion.*

J. ANDRÉ FOUILHOUX

HARRISON AND FOUILHOUX, ARCHITECTS
NEW YORK, N. Y.

Whether he realized or not the architect has used prefabricated materials in the past and he is using them more and more. Manufacturers of building material are constantly trying to appeal to their ultimate client, the builder (with or without benefit of the architect), by putting in the market an article showing economy of field labor. Some architects use moduli as units of measurements for plans and elevations. It would be extremely desirable for the architect to have freedom of choice in the use of prefabricated material and be able to combine any structural part of floor or wall construction with any finished part for floors, ceilings, or walls inside and outside. A standardization of the methods of assembling on the order of the universal couplings for railroads, for example, will accomplish this and I think in the long run all manufacturers who would cooperate in such a scheme would benefit.

Interchangeable elements would allow changes or additions which would render extremely easy the introduction at any future time of new, up-to-date features or equipment. This would help retard the obsolescence of houses.

The architect in using the modulus as a unit of measurement must develop a somewhat different technique in the study of his plans. He must keep informed on the new developments, materials, finish, equipment of the building and allied industries. The banker in assisting in the financing of such houses must think a little more of the future and not so much of the past.

The manufacturer must by properly directed advertising educate the public to new ideas in construction and finish as well as equipment. The great mass of the public is unconsciously under the influence of the advertising propaganda of the unprogressive realty developer who keeps illustrating old forms and very often in their worst or least appropriate aspects.

Articles and studies such as the one undertaken in this number of THE FORUM will help to bring about the cooperation between everybody concerned which is absolutely necessary for the ultimate success of the new methods whose value or merit will be to give the public that which it has been waiting for a long time, i.e. cheaper houses.

DR. J. O. DOWNEY

ECONOMIC RESEARCH, GENERAL MOTORS CORPORATION, NEW YORK, N. Y.

Many students of the housing problem, particularly those with a detached perspective and not dependent altogether upon the construction industry for their daily bread, long have been convinced that the only genuine and relatively lasting solution will be attained by the lowering of costs through greater factory fabrication and integration of houses and house parts.

It has been estimated by the United States Department of Labor and other statistical agencies that the field labor cost of the average small house (ex. land cost) represents roughly about 40 per cent of the total house cost. The average number of small houses produced per building trade worker per year is said to be only about .6 to .7 of a house. The average $5,000 house therefore would have a field labor cost of about $2,000, while the workers would receive only $1,200 to $1,400 annually, although the hourly wages may be quite high. This is an instance of low production and low annual incomes for skilled workers incident to an unorganized and unmechanized industry.

In the automobile industry, which is highly organized and highly mechanized, the average number of cars produced per factory worker per year is about 10, while the annual earnings of workers, in general, are well in excess of those of comparable skill in the building trades. In house building, bricks, lumber, cement, other materials and accessories and equipment are assembled at the house site; in automobile building, steel, glass, copper, other materials and accessories and equipment are assembled in a factory. In each instance parts are manufactured and assembled. Whereas an automobile represents a relatively high value per dollar of price, a house represents a relatively low value.

Through management skill production costs in the mechanized industries have been reduced markedly during the past

COMMENT CONTINUED:

two or three decades. The present $600 automobile, for instance, is a better product than the most expensive car of hardly two decades ago. House costs and prices meanwhile have increased enormously; as an index, the representative New York tenement unit, exclusive of land, which cost about $2,000 in 1900 and would cost about $6,000 in 1937. If automobiles were built by methods similar to those employed in building houses, the present $600 car probably would be priced at more than $5,000.

From these comparative premises, which are approximations only, it would seem there would be an unusual opportunity to lower the costs and prices of houses through the procedure so ably and dramatically presented by the editors of THE ARCHITECTURAL FORUM in the current article "The Integrated House." The presentation is so comprehensive and basically sound, even though one may be of another school of thought or technical conception, it would seem the goodness of the article probably would overwhelm any impulse to criticize. The article is viewed as a presentation of broad principles, rather than of specific details, and as such it is a stirring contribution to the literature of the fast growing art of prefabrication.

Houses built in accordance with the basic conceptions and procedures presented, assuredly with volume production, would result in lower costs. The lowering of construction costs and of financing charges through better management, technical and financial, would make new housing available to many now denied this blessing. At the same time many more workers would be needed for the production of houses and the annual earnings of workers would be higher.

THE FORUM plan is stimulating and constructive, it strives to provide more and better for less. The full application of the plan probably would permit several million additional families to purchase new homes now, and not be obliged to await the advent of a substantial increase in income.

MILES L. COLEAN

DEPUTY ADMINISTRATOR, FEDERAL HOUSING ADMINISTRATION, WASHINGTON, D. C.

The principles which you have outlined for integrating dwelling design and construction must be endorsed by anyone concerned with the problem of producing dwellings which are at once soundly built, conveniently planned, and low priced.

Prefabrication has too often been assumed to require a great degree of pre-assembly. Your proposals combine the economies and rationalities of standardization and interchangeability of parts (including the creation of larger parts) with the adaptability of such parts to local conditions and requirements. At the present time, the prefabricator must stand or fall with his scheme as a whole, irrespective of its local adaptability. Your plan, as I understand it, permits him to use the parts of his scheme in a broad range of combinations. The task of integrating the house, great as it is, seems a small one to that of coordinating the industry, which is necessary before any degree of integration takes place. In its assumption of that task, THE FORUM deserves, and will probably need, the solace and prayers of its friends.

JOHN ELY BURCHARD

VICE PRESIDENT, BEMIS INDUSTRIES, INC. BOSTON, MASS.

Your proposal for integration is most interesting and very well presented. It would, I believe, be obvious to anyone familiar with the work in housing of the late Albert Farwell Bemis and his organization, Bemis Industries, Inc., that, not only are we heartily in accord with the broad principles of the program here proposed, but that we have actually been working in a modest way towards that end for several years. You have stated a very important and usually neglected point when you remark that integration must take place both within and without the field of prefabrication. You have accurately charted the three major factors which can produce that integration. After working on the problem for so long Mr. Bemis became more and more certain that, desirable and necessary as interchangeable elements and multi-purpose parts were, they could not be brought into thoroughly effective interplay unless they rested on the broad base of modular design and that the module must be the same in all three directions. To his successors also your first element is fundamental to satisfactory solution of the entire problem.

In discussion of a broad problem of this sort detailed criticism is no doubt undesirable but I should like to mention with approbation that you are one of the few who have perspicaciously recognized the important contribution to modular design made by Mr. Bemis when he observed that such design must deal with the intersection of walls, floors, and roofs and with joints between elements in the same wall, floor, or roof. Close study will convince anyone that this is fundamental.

I think Bemis Industries may say with all modesty that it has given the question of modular design as long and close study as any other organization. In connection with your inquiry, therefore, as to mechanisms whereby the attainment of the objective you set may be accelerated our future policy will perhaps be of interest. Despite our active work in the past in connection with physical housing research we have determined for the future to leave that work to others. It shall be our function to concentrate on education in modular design and in propagation of the modular idea. To that end we have established a perfectly concrete program for cooperation between us and those elements of the industry which might be actively interested in the other two items of your plan. We are at the minute engaged in preparing the information necessary for those whose cooperation we shall seek and the program we shall present will, we think, be attractive to them. It will soon be ready for publication. We are pleased to make our first public announcement of this policy in connection with your admirable statement of a problem and a program for its solution.

As you aptly point out work in other fields is also progressing. You have adduced some good examples and might have adduced more of existing interchangeable elements and multi-purpose parts. These will grow in any event, but if the present commercial agencies study the implications of your program carefully, they may be moved to more intensive research. The results of that study should not only be profitable to those who pursue it but should go far toward making low-cost housing possible without burdensome subsidy.

BUCKMINSTER FULLER

DIRECTOR, PHELPS-DODGE RESEARCH LABORATORIES NEW YORK, N. Y.

THE ARCHITECTURAL FORUM's analysis of integration in the Building Industry seems to me a most excellent grouping of the *assembly design* factors involved in the ever more rapidly accelerating events in the transition of building from a craft to an industry.

It must be borne in mind however that there are other equally important factors in the evolution to that of the assembly

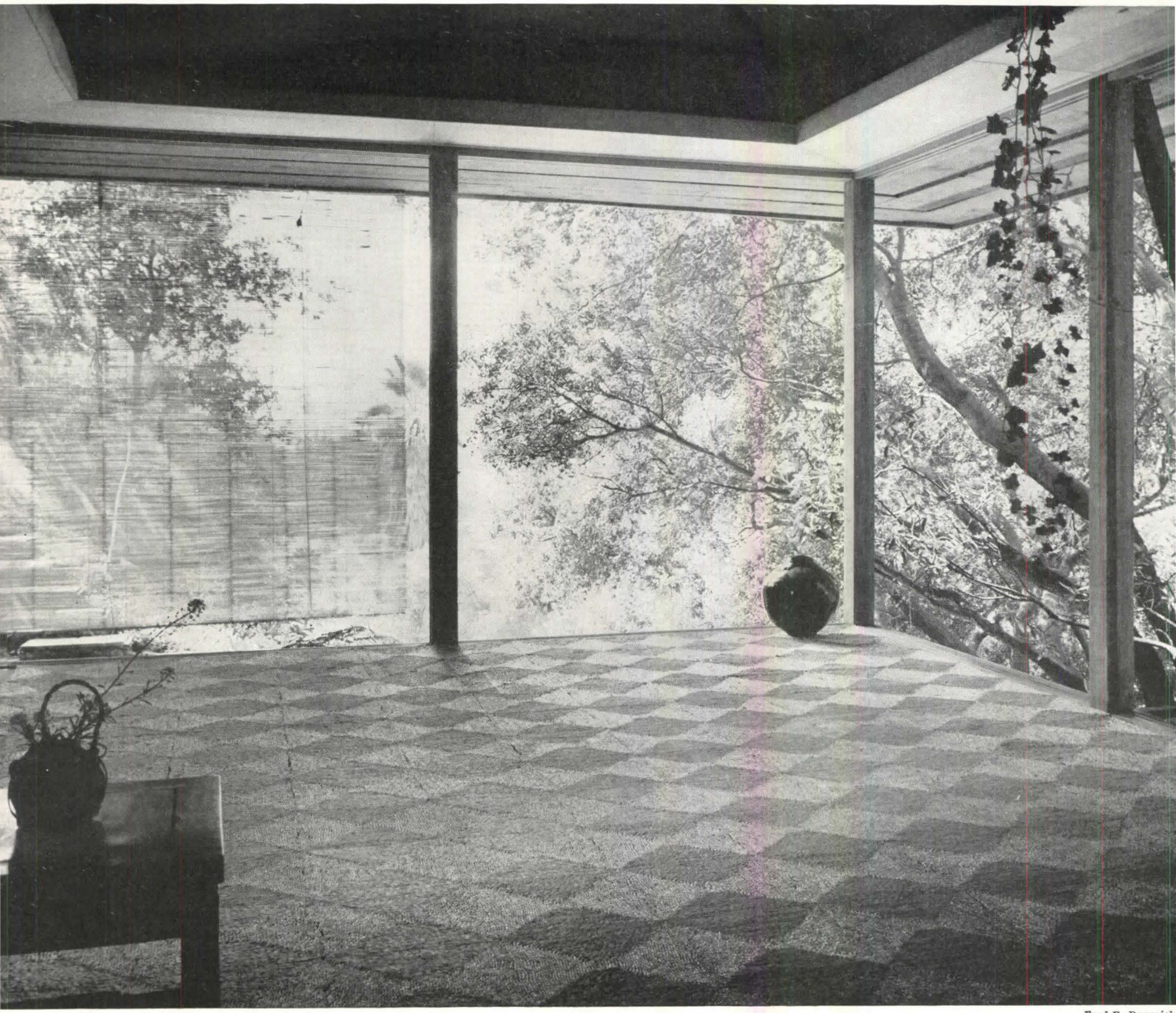
(Continued on page 148)

COMMENT BY **WALTER McCORNACK,** CHAIRMAN, THE COMMITTEE ON HOUSING, AMERICAN INSTITUTE OF ARCHITECTS, AND **RAYMOND V. PARSONS,** CONSULTING ENGINEER, NEW YORK, N. Y., APPEARS ON PAGE 152. MR. FULLER'S REMARKS ARE CONTINUED ON PAGE 148.

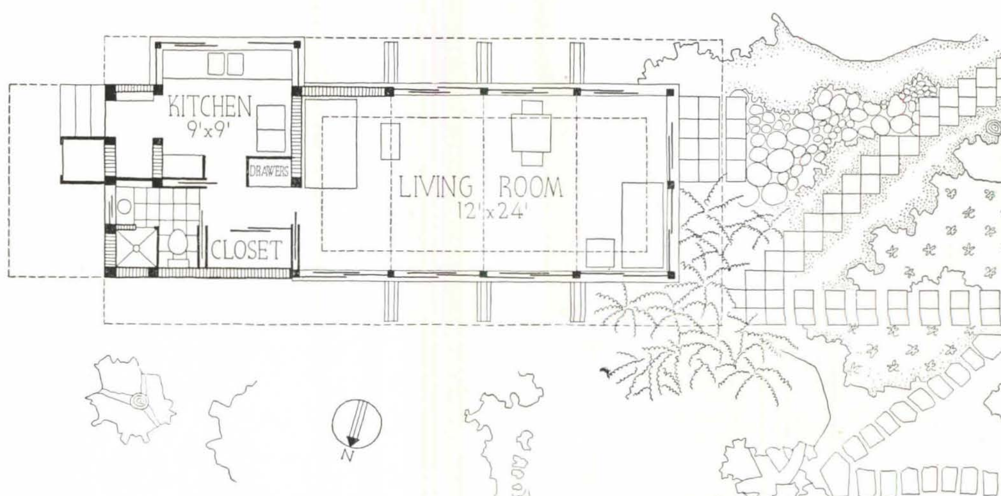
FIFTY NEW HOUSES

BUILDING COSTS VARY FROM MONTH TO MONTH, FROM TOWN TO TOWN. COSTS QUOTED IN THE FORUM ARE IN ALL CASES SUPPLIED BY THE ARCHITECT, ARE USEFUL AS A RELATIVE GUIDE IN COMPARING ONE HOUSE WITH ANOTHER, BUT IN NO CASE ARE TO BE INTERPRETED AS A LITERAL AND LOCAL CURRENT INDEX.

1. HOUSE IN FELLOWSHIP PARK, LOS ANGELES, CALIFORNIA

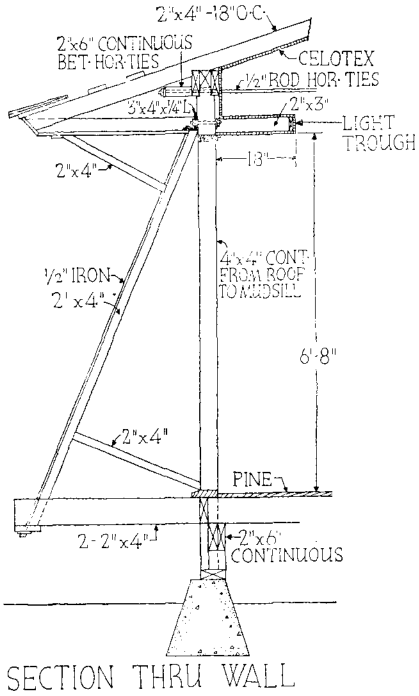


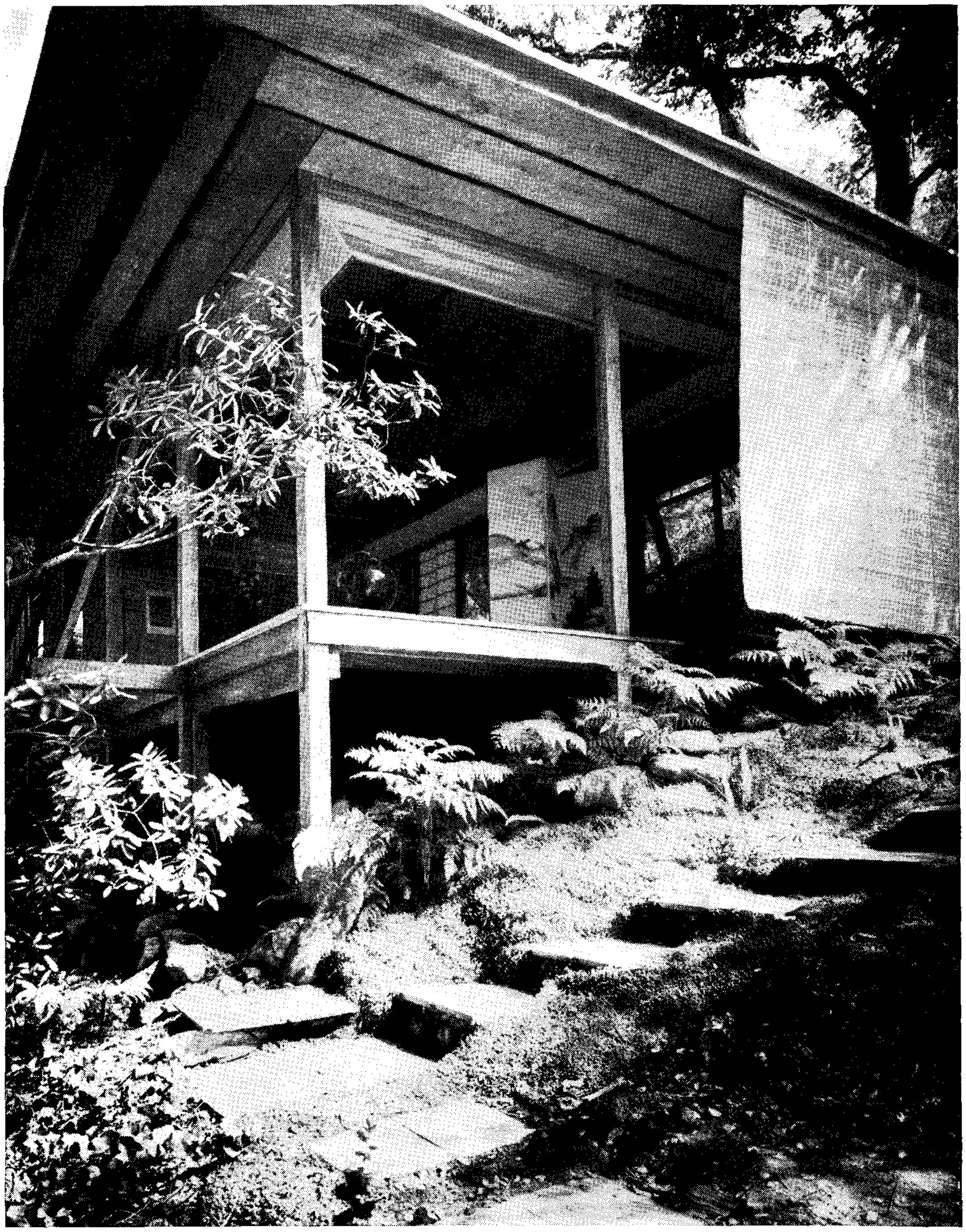
Fred R. Dapprich



FLOOR PLAN

HARWELL HAMILTON HARRIS, DESIGNER





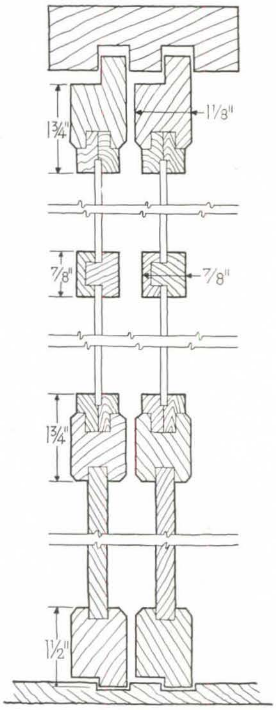
A house like this could be built in only a very favorable climate. With this advantage, and within the limitations of an extremely restricted budget, the designer has produced a house showing remarkable imagination and ingenuity, a brilliant solution of a problem of shelter.

The architect comments: "The building is planned for two adults; its accommodations are comparable to those of a small apartment. It is one of several dwellings to be built on a plot of about two acres situated in an oak-covered hillside reached only by a footpath. The difficulty of access makes light construction imperative. The building site—a narrow ledge—calls for a narrow plan. The beautiful surroundings, together with the privacy which the trees and the differences in level permit, suggest an extensive use of glass.

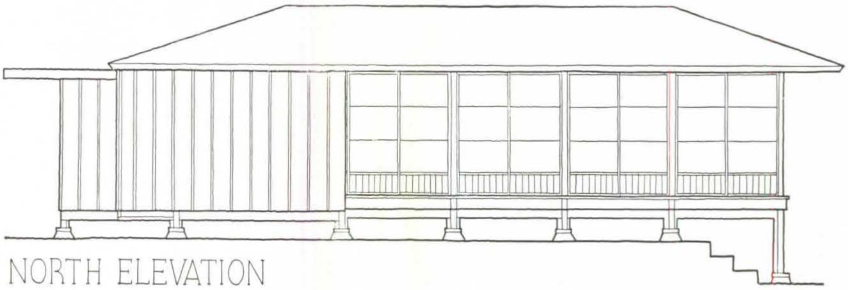
"Though seemingly a mere artistic adventure, this project is principally conditioned by economic factors. Fellowship Park consists of a beautifully wooded slope of about two acres looking toward the mountains and located about four miles from the center of town. The district is composed of an odd mixture of comfortable homes and mere shacks. The city has pushed by, leaving this a definitely blighted area.

"The development is to consist of a group of small homes resembling the one shown, each with its private

HOUSE IN FELLOWSHIP PARK, LOS ANGELES, CALIF.



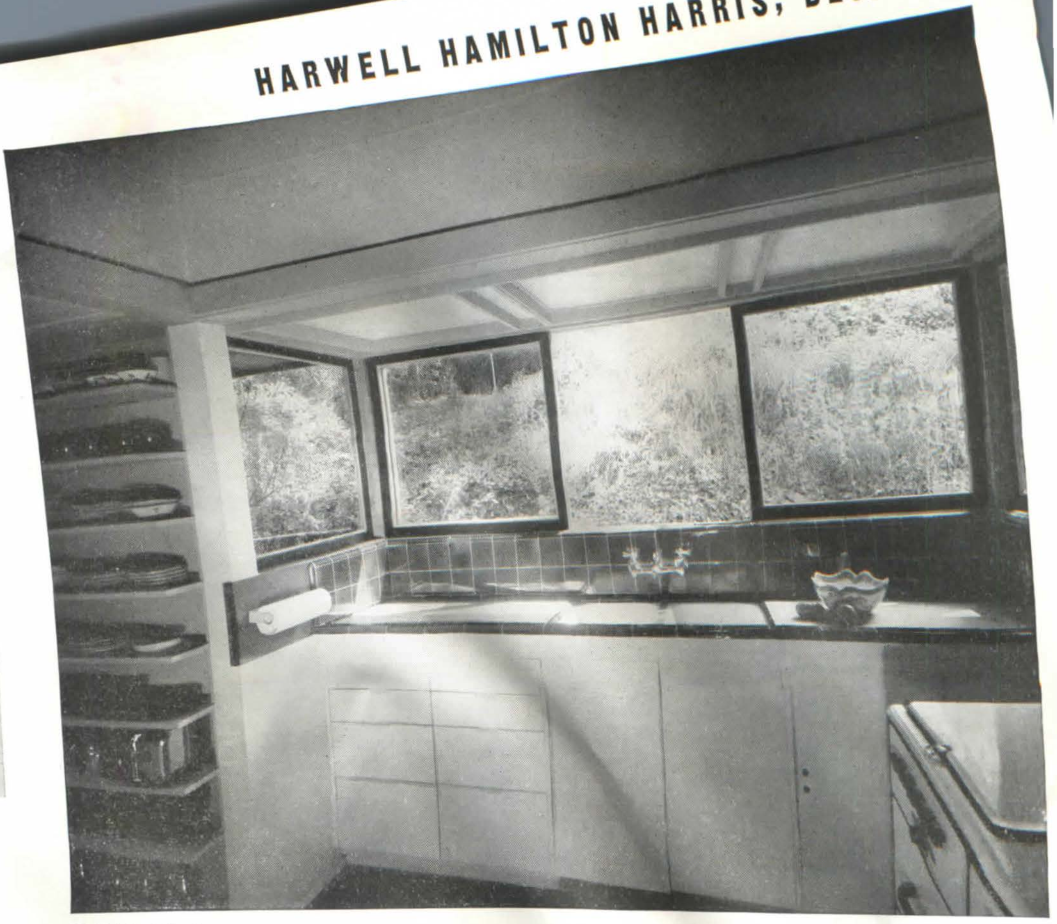
SECTION THRU SLIDING EXT· DOORS


NORTH ELEVATION

garden. Each unit will cost from $1,500 to $2,500. The project is designed to appeal to young professional people just beginning their careers, thus in the low income level, and to whom a fashionable address is a dubious distinction. So far plans are proceeding slowly as there is practically no mortgage money available for this type of development, and the owner dislikes the type of dictation practiced by certain lending institutions.

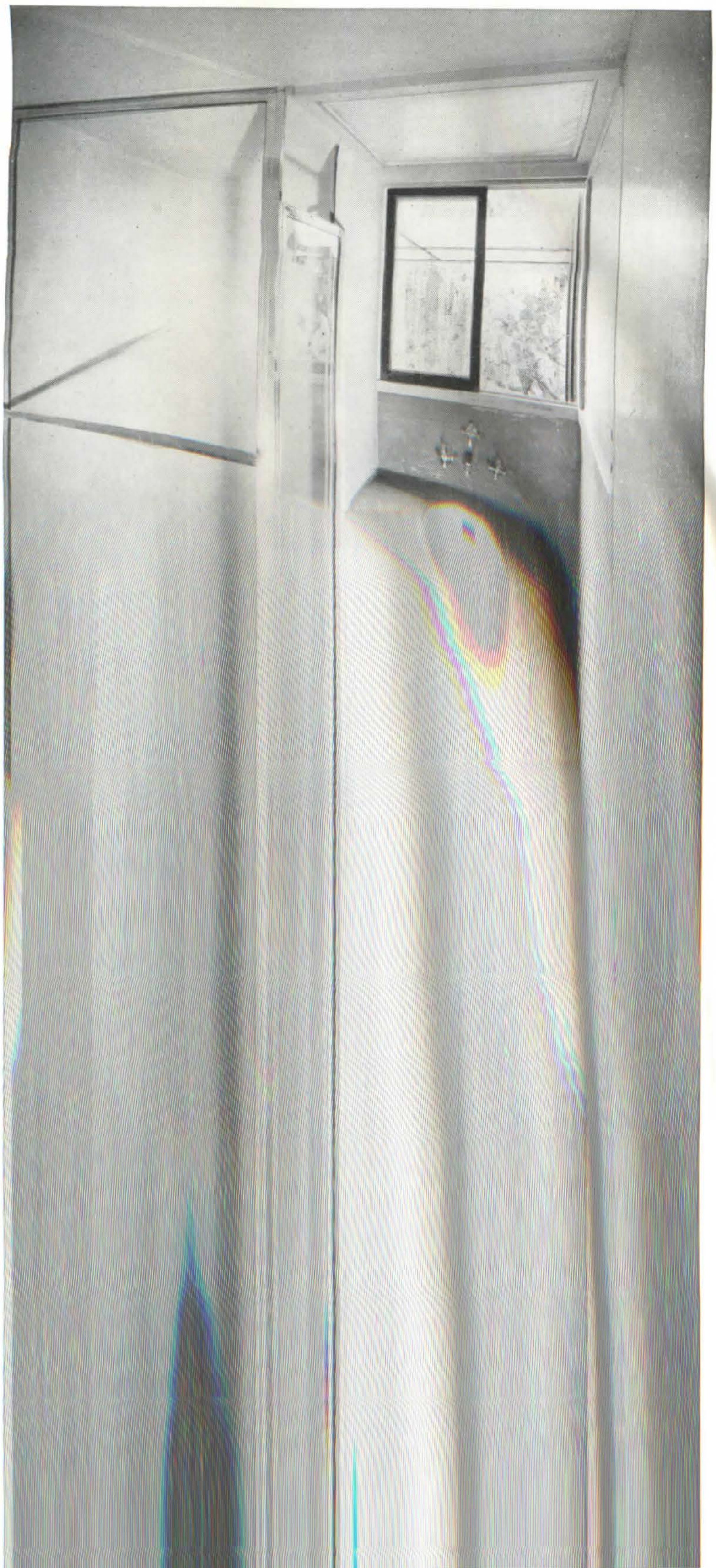
"In this house bathroom and kitchen are small but well supplied with storage space. A difference in ceiling heights tends to keep the walls of the rooms in scale with their floors; the partition between kitchen and hall does not go to the ceiling; neither does the top of the closet, which forms a shelf above which lights are concealed. The sliding doors of the living room are of light construction and can be easily removed and replaced."

Cost: $3 per square foot.



KITCHEN

BATH



CONSTRUCTION OUTLINE

FOUNDATION
Concrete piers.

STRUCTURE
Exterior walls—12 in. vertical redwood boards with battens, fir studs. Interior: Living rooms—redwood, vertical boarding. Bath and Kitchen—Masonite Quartrboard, Masonite Corp. Ceilings—Celotex, The Celotex Co., Masonite Corp. Floor construction—built-up floor and roof girders; floor joists double at posts and cantilevered to receive wood and iron compression-tension buttresses which provide horizontal stiffness; iron roof ties.

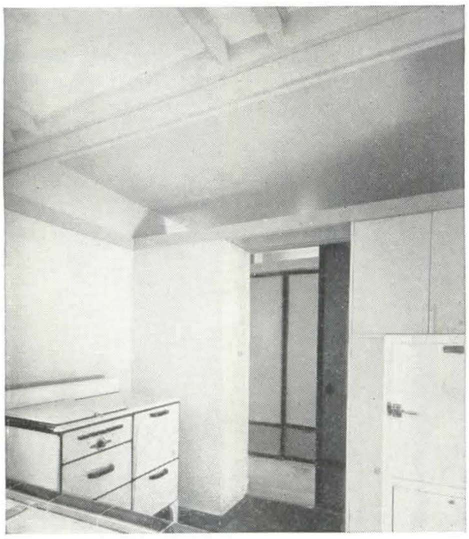
ROOF
Shingles, 16 in. redwood.

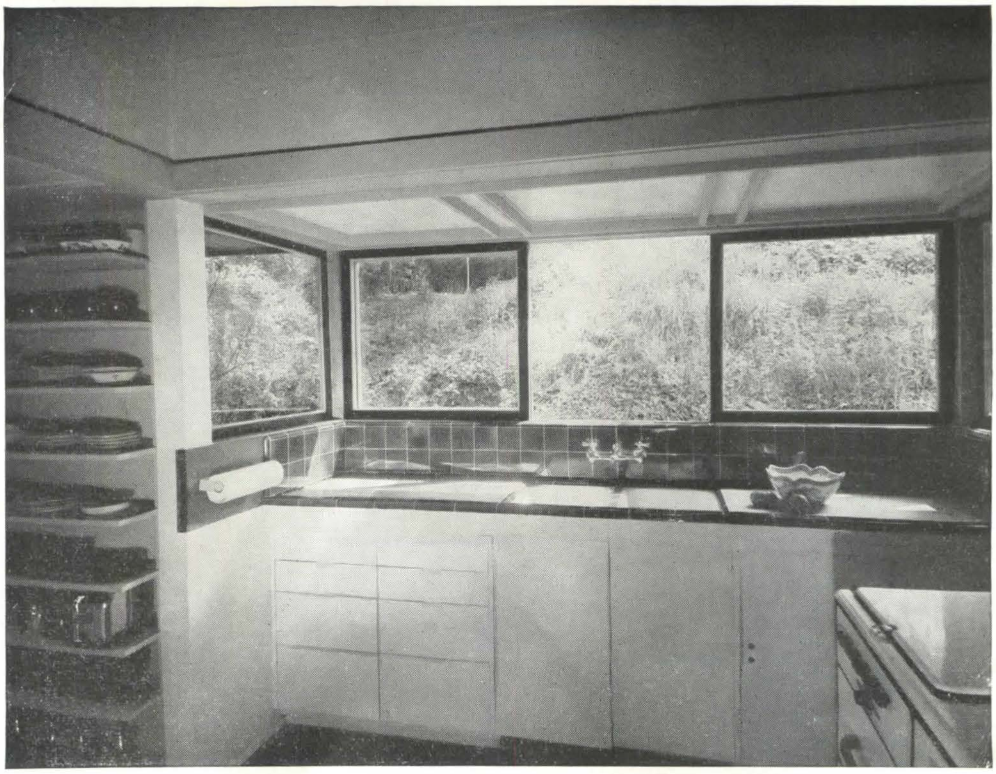
INSULATION
Ceiling and all

2. HOUSE IN HARRISON, NEW YORK

...characterizes this house. The effect of hori-

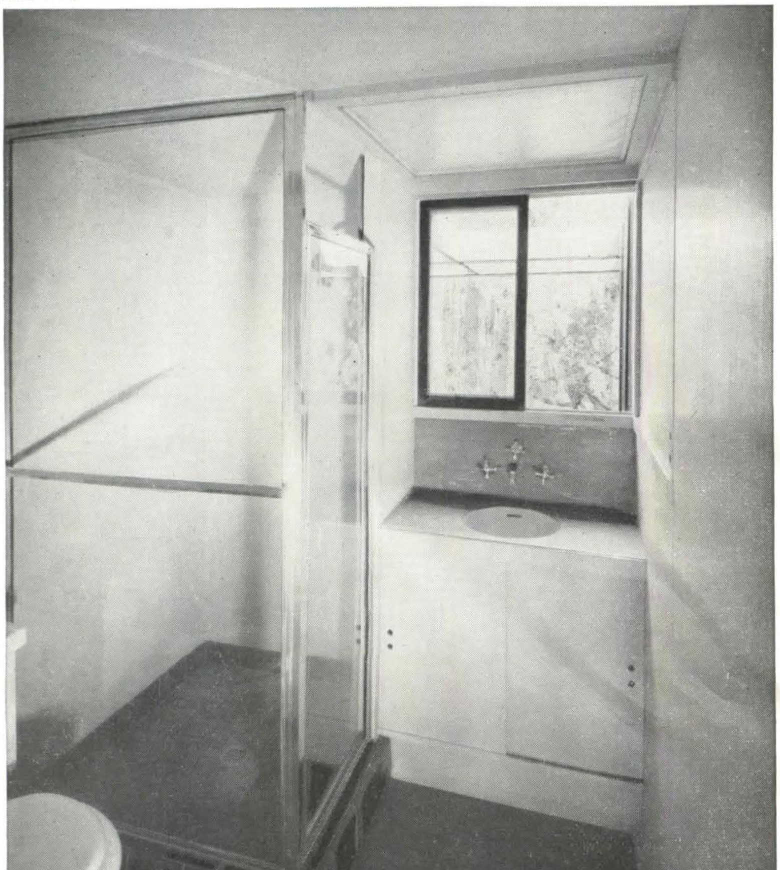
...in the placing of garage and maid's





KITCHEN

BATH



CONSTRUCTION OUTLINE

FOUNDATION
Concrete piers.
STRUCTURE
Exterior walls—12 in. vertical redwood boards with battens, fir studs. Interior: Living rooms—redwood, vertical boarding. Bath and Kitchen—Masonite Quartrboard, Masonite Corp. Ceilings—Celotex, The Celotex Co., Masonite Corp. Floor construction—built-up floor and roof girders; floor joists double at posts and cantilevered to receive wood and iron compression-tension buttresses which provide horizontal stiffness; iron roof ties.
ROOF
Shingles, 16 in. redwood.
INSULATION
Ceiling and all sliding partition panels—½ in. Celotex, The Celotex Co. Kitchen and bath ceilings—aluminum foil.
WINDOWS
Horizontal sliding wood windows; oak track. Glass—Pennvernon, Pittsburgh Plate Glass Co.
FLOORS
Living room—fir covered with ½ in. grass matting. Kitchen and bath—linoleum covered fir.
WOODWORK
Lighting cornice—white pine. Cabinets—Douglas fir and Masonite.
HARDWARE
Interior and exterior—Schlage Lock Co.
ELECTRICAL INSTALLATION
Wiring system—steeltube conduit, Steel & Tubes, Inc. Switches—tumbler. Fixtures—indirect, translucent ceilings in bath and kitchen.
KITCHEN EQUIPMENT
Range—gas. Refrigerator—electric. Sinks—Standard Sanitary Manufacturing Co.
BATHROOM EQUIPMENT
All fixtures by Standard Sanitary Manufacturing Co. Lavatory—built-in with rubber counter.
HEATING
Floor furnace, 30,000 watt. Hot water heater—automatic storage type.

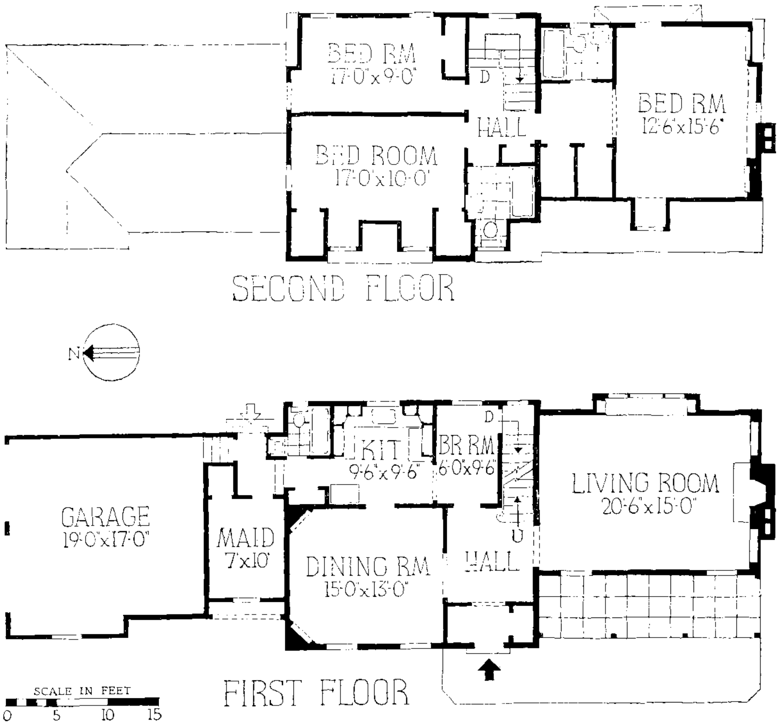
2. HOUSE IN HARRISON, NEW YORK

An agreeable consistency of materials and scale characterizes this house. The effect of horizontality produced by the low eaves is further enhanced by the placing of garage and maid's quarters in a low wing.

The architect comments: "A compact, well laid out plan. The first floor breakfast room off the large foyer can be used for a variety of purposes if the owner does not require it for dining.

"The cellar stair is well placed. Guests using the basement play room are not required to pass through any service quarters. The stair is also readily accessible to the kitchen. The circulation is convenient, and the window lighting both the stairway and second floor hall is also desirable."

Cubage: 35,000. Cost: $12,950 at 37 cents a cubic foot.



LIVING ROOM

CONSTRUCTION OUTLINE

FOUNDATION
Walls—concrete block, continuous. Waterproofing—Toch Brothers, Inc.

STRUCTURE
Exterior walls—wood studs, Creo-Dipt shingles, Creo-Dipt Co., Inc. Interior partitions—Ecod lath plaster, Reynolds Metal Co., Inc. Floor construction—wood beams, double flooring; plaster ceiling on wire lath.

ROOF
Construction—wood rafters, shingle strips, covered with Perfection wood shingles.

CHIMNEY
Terra cotta lining.

SHEET METAL WORK
Flashing and gutters—Anaconda copper, American Brass Co.

INSULATION
Outside walls—Metallation, Reynolds Metal Co., Inc. Roof—rock wool, Johns-Manville, Inc. Weatherstripping—copper.

WINDOWS
Sash—wood, Andersen Frame Corp. Glass—Pittsburgh Plate Glass Co.

STAIRS
Material by Curtis Companies, Inc.

FLOORS
Living room, bedrooms and halls—wood, Harris Manufacturing Co. Kitchen and bathrooms—linoleum, Armstrong Cork Products Co.

WALL COVERINGS
Living room, bedrooms and halls—wallpaper, W. H. S. Lloyd Co., Inc. Bathrooms—tile, Robertson Art Tile Co.

WOODWORK
Trim and doors—Curtis Companies, Inc.

HARDWARE
Interior and exterior—Norwalk Lock Co.

PAINTING
All paint Evanlite, Evans Brothers. Roof stain—Samuel Cabot, Inc.

ELECTRICAL INSTALLATION
Wiring system—BX. Switches—Hart & Hegeman.

KITCHEN EQUIPMENT
Stove—The Estate Stove Co.

PLUMBING
All fixtures by Standard Sanitary Manufacturing Co. Pipes: Soil and waste—cast iron. Water supply—Anaconda copper, American Brass Co.

HEATING
Steam. Oil burner—General Electric Co. Radiators—American Radiator Co. Valves—Airid, Hoffman Specialty Co. Regulators—Minneapolis Honeywell Regulator Co. Monel metal tank—The International Nickel Co., Inc.

3. HOUSE FOR THOMAS TROY, NEEDHAM, MASS.

Arthur C. Haskell Photos

PROBLEM: To design a house comparable in size and convenience to a small apartment, with building and maintenance costs to equal, as nearly as possible over a long period of time, the rent of an apartment.

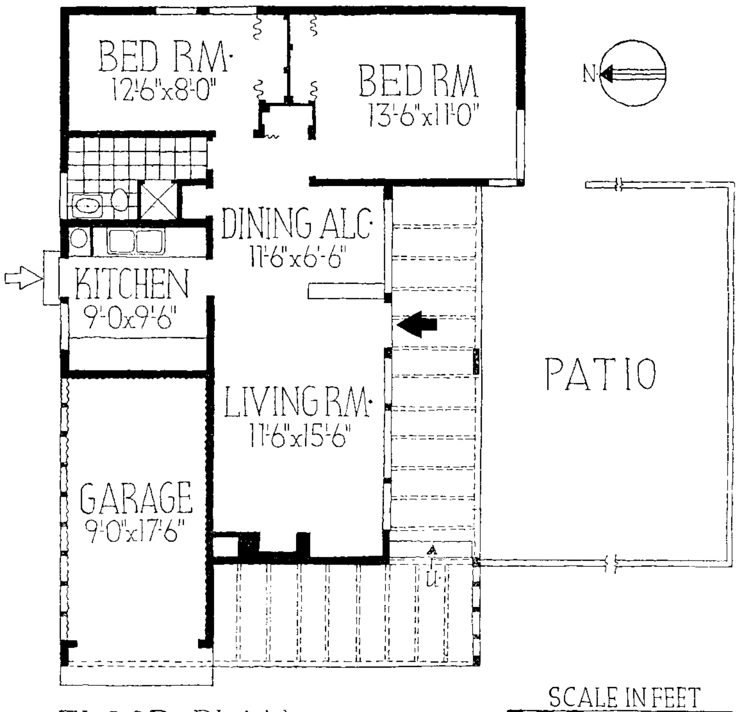
A small modern house, of particular interest because the architect, well-known in the small house field, has previously been identified with work based on New England stylistic precedent. The plan is excellent, and the appearance of the exterior will be greatly improved when the landscaping has been completed.

The architect comments: "The plan was influenced by the type of heating system, and, of course, by the orientation of the lot, centralization of plumbing, and convenience of access. The two bedrooms can be closed off by curtain from the rest of the house; the dining room and kitchen can be similarly separated from the living room.

"The roof was built with a slight slope and no drains as an experiment. It was found that this was not too satisfactory, however, and one drain was added at the rear which has proven adequate."

Cubage: 10,240. Cost: $3,481 at approximately 34 cents a cubic foot.

ROYAL BARRY WILLS, ARCHITECT; HUGH A. STUBBINS, ASSOCIATE



FLOOR PLAN

CONSTRUCTION OUTLINE

FOUNDATION
Walls—concrete, continuous; inside—piers.

STRUCTURE
Exterior walls—matched boards, paper, studs, rock wool, Homasote, Agasote Millboard Co. Interior—paint and Homasote on wood studs. Floor construction—Celotex on wood joists, wood floor.

ROOF
Wood, built-up tar and gravel, Celotex insulation.

SHEET METAL WORK
Flashing—copper.

WINDOWS
Sash—casement, Hope's Windows, Inc. Glass—single strength, quality A, Libbey-Owens-Ford Glass Co.

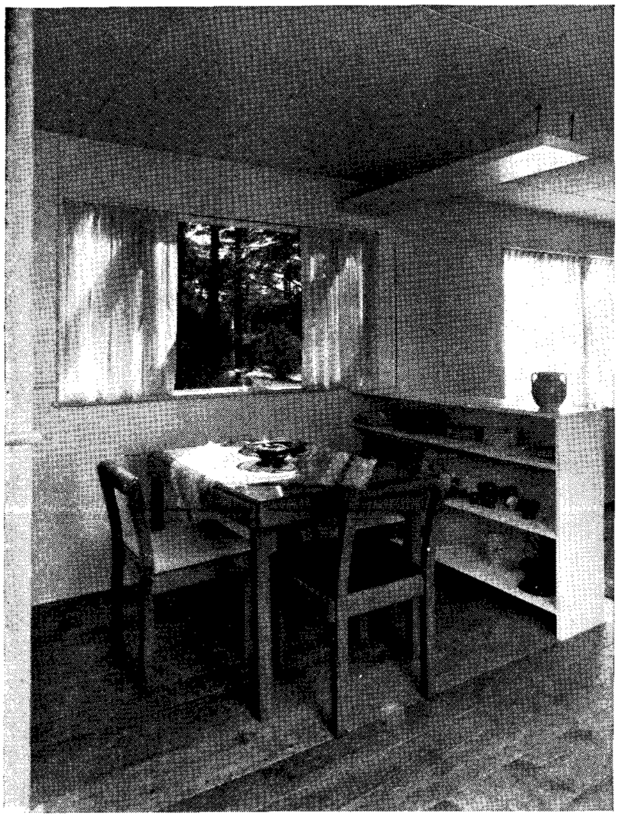
FLOORS
All wide boards, kitchen and bath covered with linoleum.

ELECTRICAL INSTALLATION
Wiring system—BX. Switches—stock tumbler. Fixtures—indirect, special.

KITCHEN EQUIPMENT
Stove—gas. Refrigerator—Electrolux, Servel, Inc.

PLUMBING
All fixtures by Standard Sanitary Manufacturing Co. Water pipe—copper.

HEATING
Warm air, two gas heaters hung on floor joists, Payne Furnace & Supply Co.


DINING ALCOVE


LIVING ROOM

4. HOUSE IN DALLAS, TEXAS

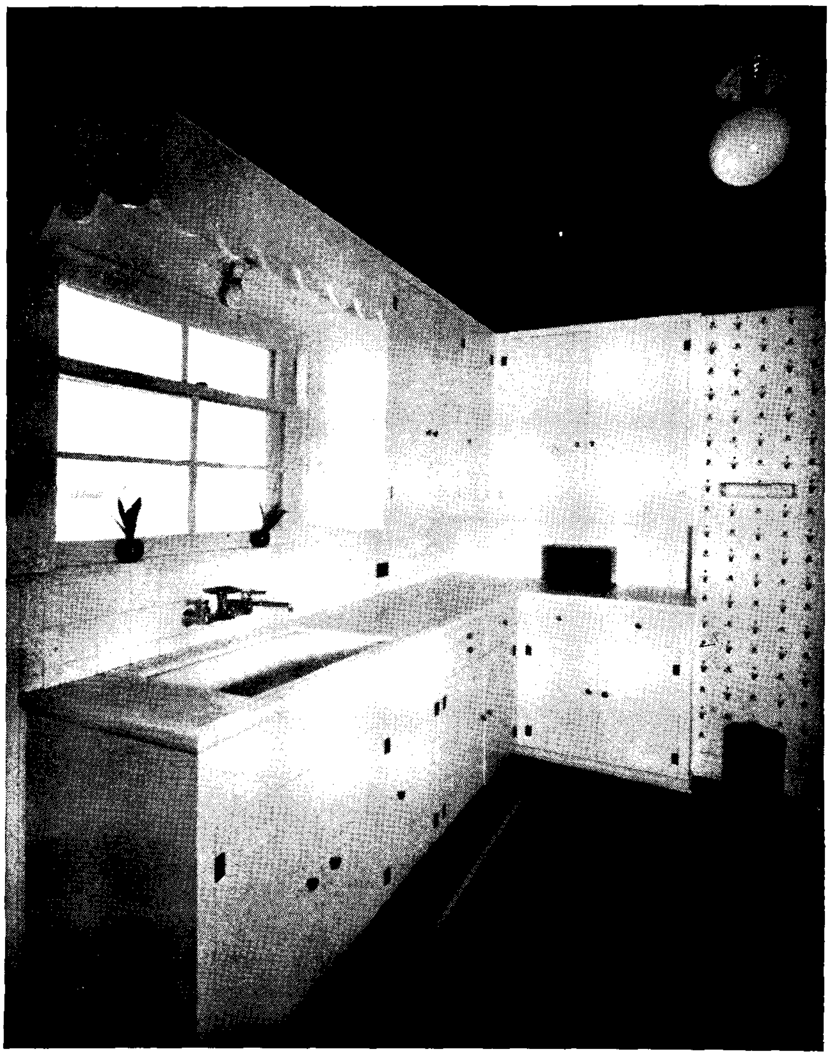
ENTRANCE DETAIL

Parker-Griffith

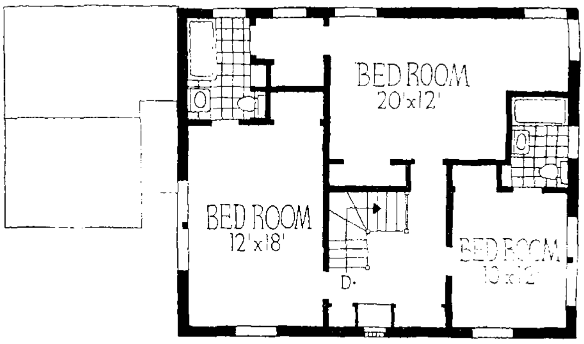
This conventional-looking house has some interesting features not commonly seen in the small house. Chief of these is the louvered porch, which meets the requirements of the summer climate by providing maximum ventilation with control of sunlight. It also gives the living room a southern exposure and adds decorative interest to the interior. The dark ceiling in the kitchen is unusual, and while its illumination value is dubious, it is undeniably effective in producing a trim, neat appearance.

The architect comments: "The service part of the house was treated in accordance with the owners' requests; the rear entrance may be entered from the garage or outside. A breakfast room originally planned was omitted and changed to a pantry and entry. Special consideration was given to providing ample closet space, and the owners are delighted with the number of ample closets, all of which are cedar lined."

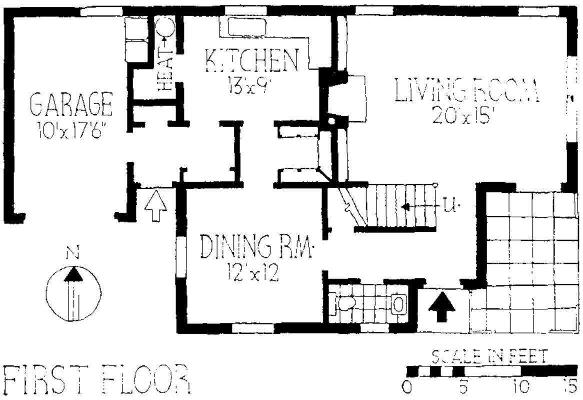
Cubage: 18,900. Cost: $8,400 at 44 cents a cubic foot.



KITCHEN



SECOND FLOOR



FIRST FLOOR

LIVING ROOM

Parker-Griffith Photos

CONSTRUCTION OUTLINE

STRUCTURE
Walls—common brick, diagonal shiplap sheathing, Reynolds Metal Co.'s Metallation, studs, Milcor Sheet Co.'s metal lath and U.S. Gypsum Co.'s plaster. Floor construction: First—4 in. concrete slab on wooden beams. Finish—oak floor bedded in hot asphalt. Second—2 x 10 in. joists, 1 x 6 in. sub-floor, deadening felt and oak flooring. Ceiling—metal lath and plaster.

ROOF
Construction—rafters, sheathing, covered with Perfection cedar shingles.

INSULATION
Outside walls—Metallation, Reynolds Metal Co., Inc. Attic floor—rock wool, Johns-Manville, Inc.

WINDOWS
Double hung, white pine. Glass—double strength, quality A.

FLOORS
Living room, bedrooms and halls—clear plain red oak, Martin Flooring Co. Kitchen—inlaid linoleum, Congoleum-Nairn, Inc. Bathrooms—tile.

WALL COVERINGS
All rooms—wallpaper. Bathrooms—tile wainscot.

WOODWORK
Trim—yellow pine. Shelving, cabinets and doors—white pine.

HARDWARE
Interior and exterior—Sargent & Co.

PAINTING
Interior: Walls, ceilings, trim and sash—3 coats lead and oil, Pittsburgh Plate Glass Co. Exterior: Walls—2 coats cement paint, Medusa Portland Cement Co. Roof—stain.

ELECTRICAL INSTALLATION
Wiring system—steel tube conduit. Switches—flush-tumbler. Fixtures—direct, Chase Brass & Copper Co.

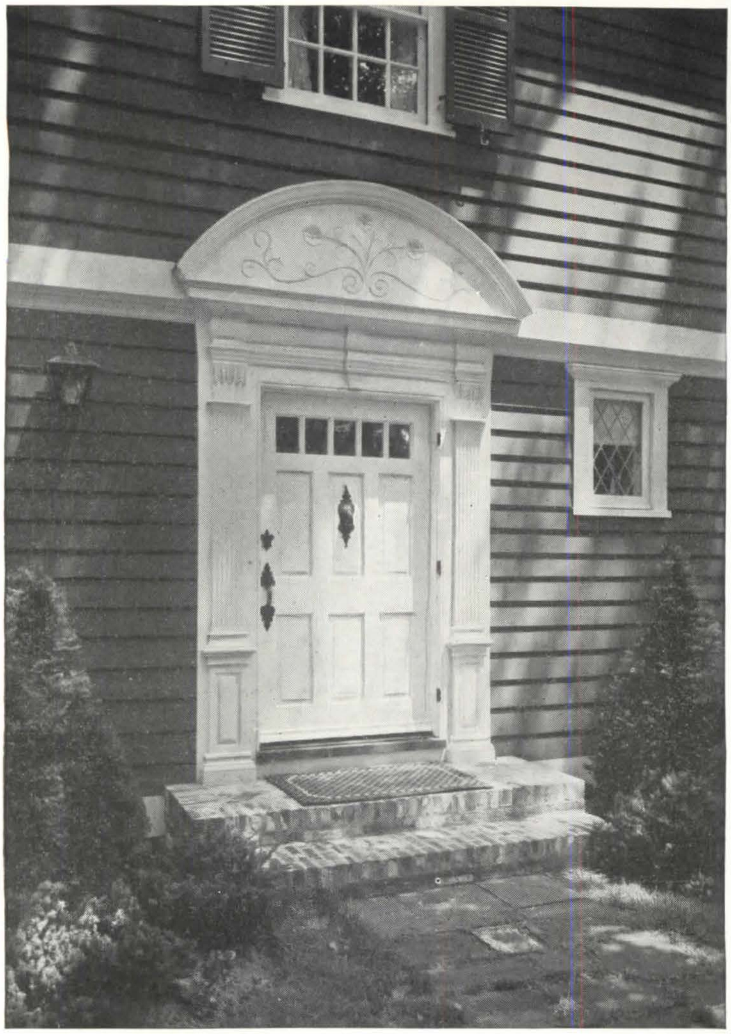
KITCHEN EQUIPMENT
Stove—gas range. Refrigerator—Electrolux, Servel, Inc. Sink—Crane Co.

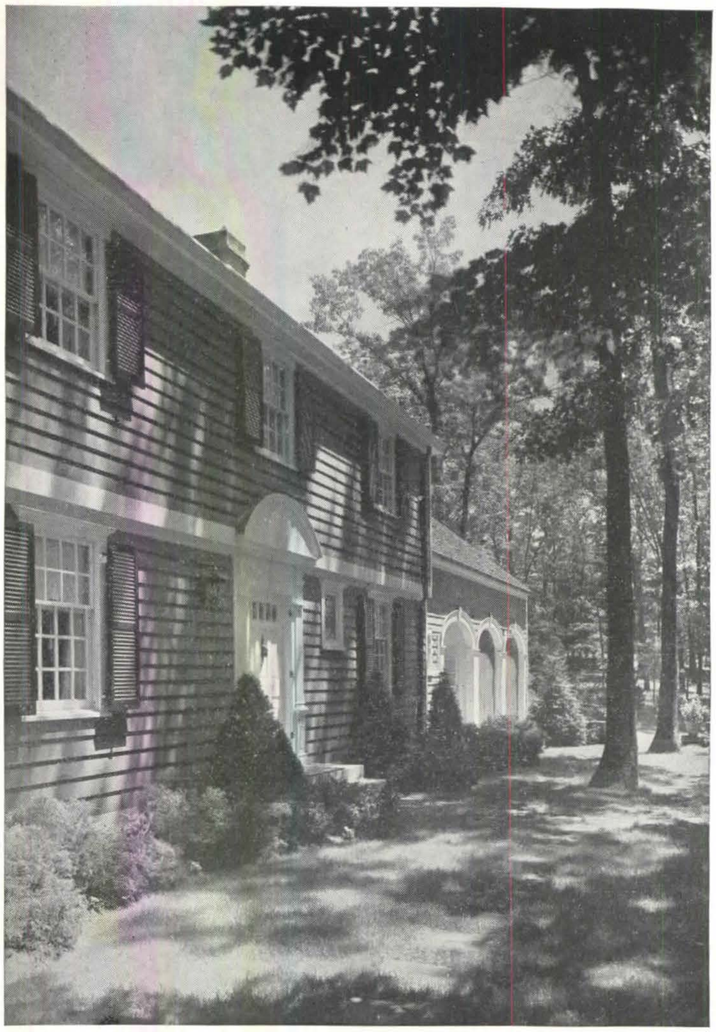
BATHROOM EQUIPMENT
All fixtures by Crane Co.

PLUMBING
Soil, waste and vent pipes—galvanized iron. Water supply pipe—copper.

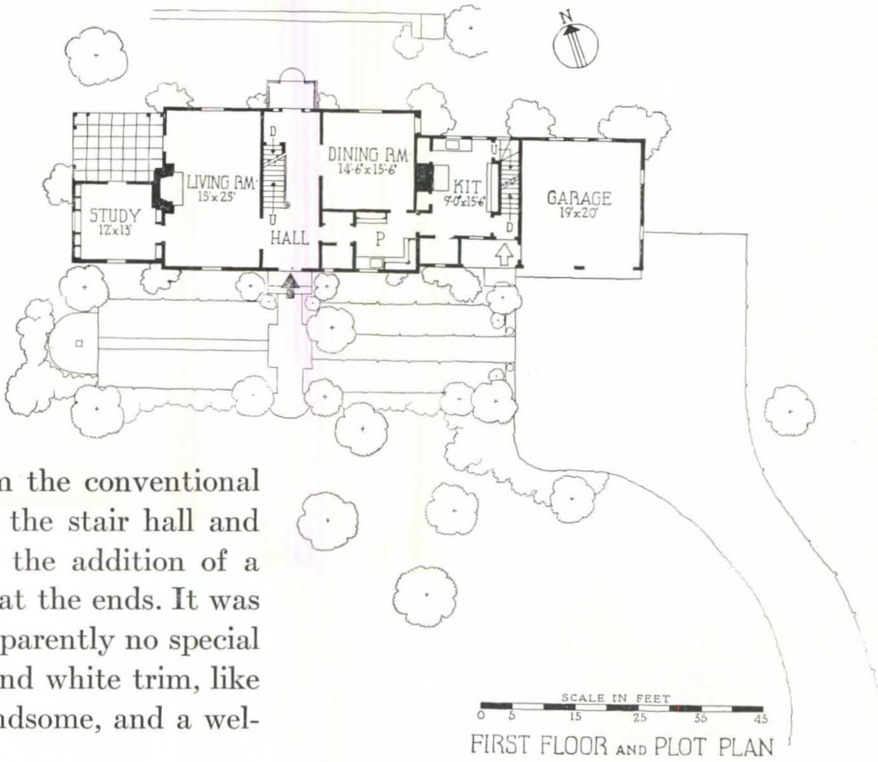
HEATING AND AIR CONDITIONING
Gas, individual units.

5. HOUSE FOR WALTER E. CRUTTENDEN, LONGMEADOW, MASS.



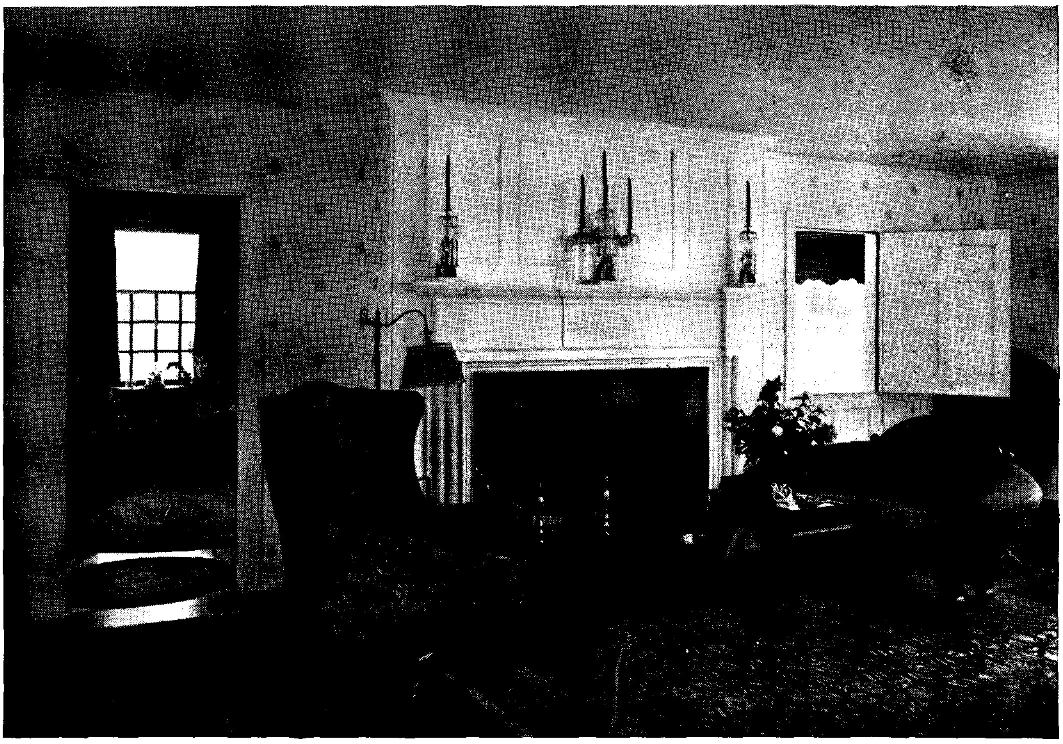


Samuel H. Gottscho Photos



The long narrow plan was developed from the conventional rectangle with living room on one side of the stair hall and dining room and service on the other, by the addition of a study and porch and a kitchen and garage at the ends. It was built for a man and wife, and there were apparently no special requirements. The deep red exterior walls and white trim, like those of the early farmhouses, are very handsome, and a welcome change from the monotony of white.

Cubage: 50,525. Cost: $16,314 at 32 cents a cubic foot.



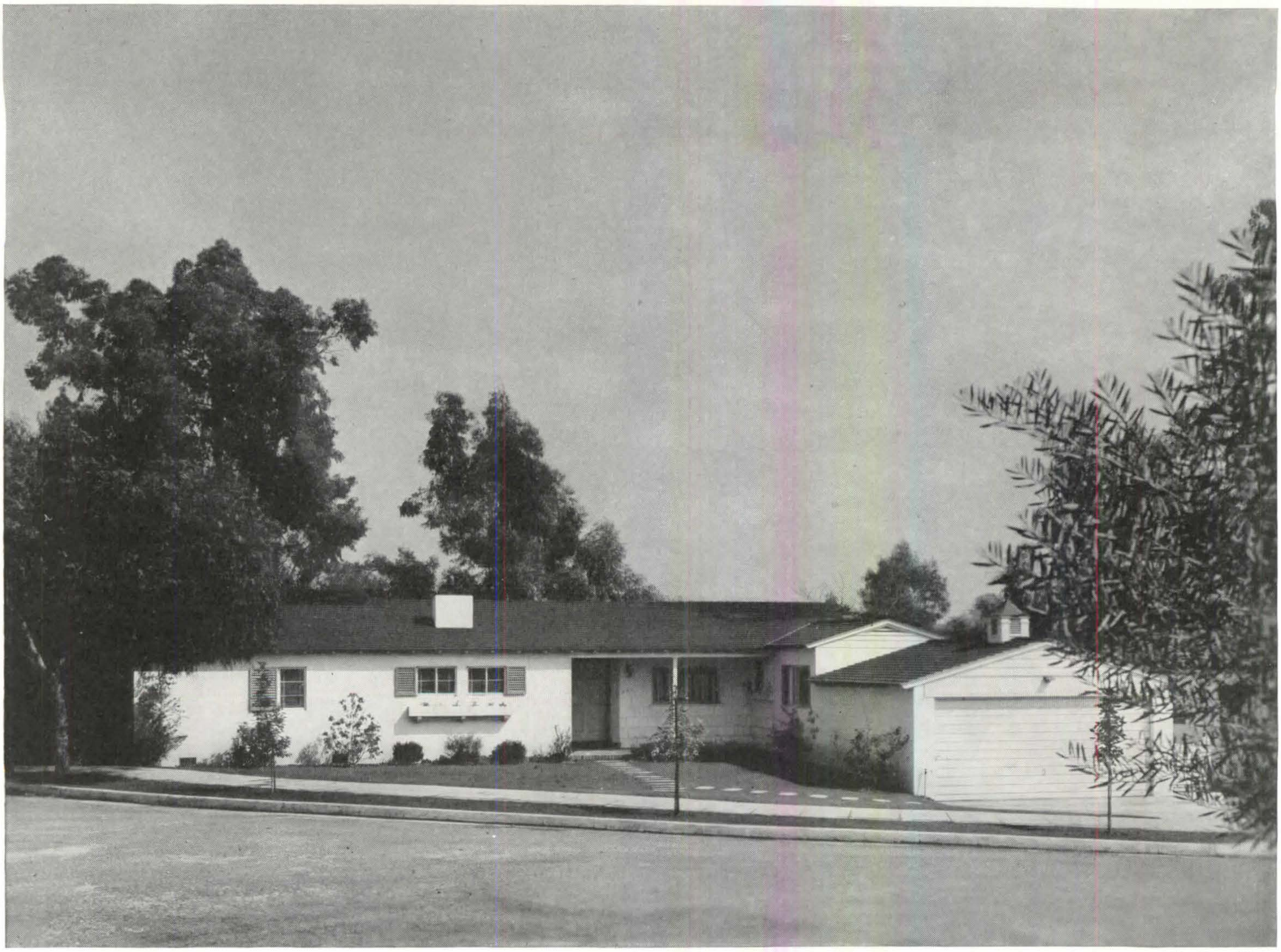
LIVING ROOM

STAIR HALL

CONSTRUCTION OUTLINE

FOUNDATION
Walls—8 in. brick, buttressed. Waterproofing—waterproof cement, Medusa Portland Cement Co. 2 coats Minwax fibrous brush coat below grade, Minwax Co.
STRUCTURE
Exterior walls—beveled siding, waterproof building paper, diagonal sheathing, studs, metal lath and 3 coats plaster. Floor construction—fir joists and diagonal subfloor. Ceiling—metal lath and plaster.
ROOF
Construction—rafters and shingle lath covered with red cedar, hand-split shakes.
CHIMNEY
Lining—standard fire clay. Damper—H. W. Covert Co.
SHEET METAL WORK
Flashing—copper. Gutters—copper and fir.
WINDOWS
Sash—double hung, white pine. Frame—Andersen Frame Co. Glass—double strength, quality A. Screens—bronze mesh, half length sliding.
STAIRS
Treads, stringers and risers—birch, Curtis Cos., Inc.
FLOORS
Main rooms—red oak. Kitchen and bathroom—covered with rubber tile.
WOODWORK
Trim, shelving and doors—Curtis Cos., Inc.
HARDWARE
Interior and exterior—Yale & Towne Manufacturing Co.
PAINTING
Floors—stain, wax and polish. Roof—stained. All other paint—lead and oil.
ELECTRICAL INSTALLATION
Wiring system—BX. Fixtures—Cassidy Co. Fixtures—Cassidy Co.
KITCHEN EQUIPMENT
Cabinets—G. I. Sellers & Sons Co.
PLUMBING
All fixtures by Standard Sanitary Manufacturing Co. Pipes: Soil, waste and vent—extra heavy cast iron. Water supply—brass.
HEATING AND AIR CONDITIONING
Forced air system; filtering, humidifying, Holland Vaporaire, Holland Furnace Co.

6. HOUSE FOR RICHARD R. TOWNLEY, SAN MARINO, CALIF.



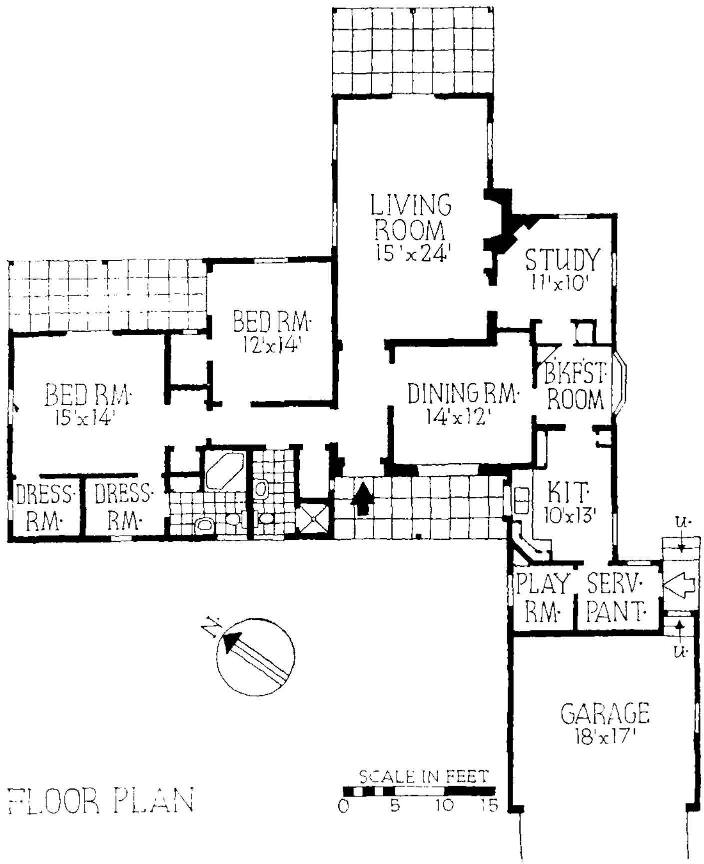
Miles Berne Photos

Much of the attractiveness of California domestic work may be attributed to the placing of all rooms on one floor and the consequent long, low lines. The exterior, rambling plan, and the attached garage of the house shown here are all typical of the locality.

The architect comments: "The house is planned with the living room to the rear to take advantage of more favorable exposures, and because the rear of the property includes an interesting arroyo which offers unusual landscaping possibilities. The kitchen is planned with a window above the sink, overlooking the entrance porch. The owner considers this a very desirable feature. The attached garage with direct under-cover access is also considered desirable.

"The breakfast room is a common feature in California houses where a southern or eastern exposure is available. Where there are no servants quartered in the house, breakfasts are often prepared by the family, the maid arriving in time to do the dishes. It is also useful as a pantry when meals are being served in the dining room. In California there are probably as many small houses with breakfast rooms as there are without them. It seems to be a matter of owners' desires."

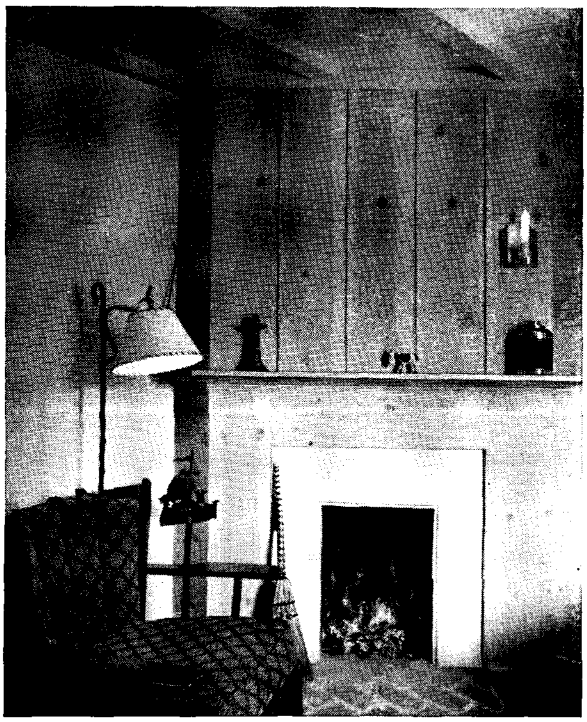
Cubage: 31,000. Cost: $7,000 at 22½ cents a cubic foot.



CONSTRUCTION OUTLINE

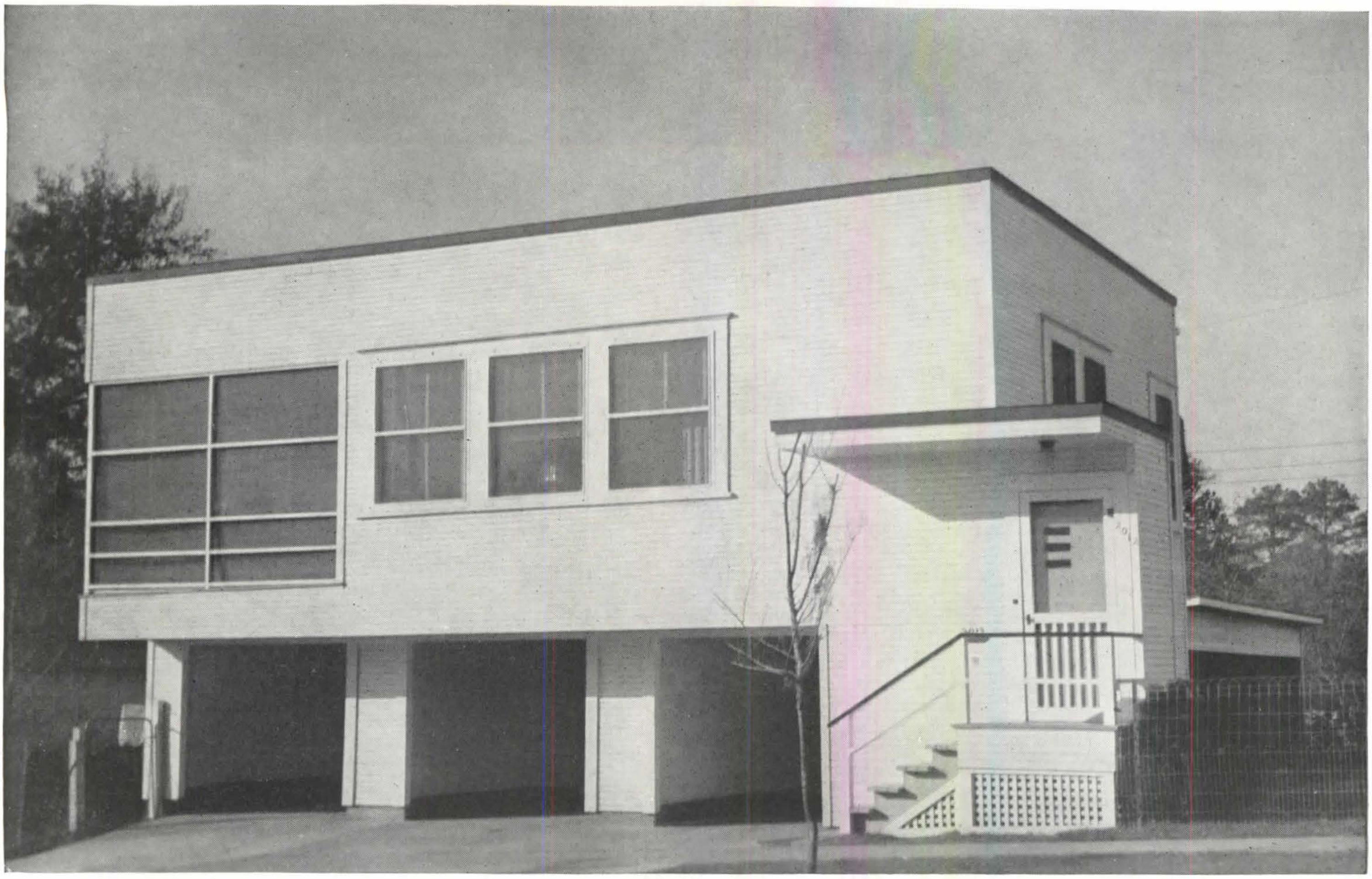
FOUNDATION
Walls—concrete.
STRUCTURE
Exterior walls—cement plaster, wood studs. Interior partitions—plaster on studs. Floor construction—wood joists, 6 in. sub-floor.
ROOF
Wood frame covered with shingles.
CHIMNEY
Lining—terra cotta; metal fireplace damper, Richardson & Boynton Co.
SHEET METAL WORK
Flashing—galvanized iron.
WINDOWS
Sash—steel, Druwhit Co. Glass—single strength, quality B. Blinds—1⅜ in. fir.
FLOORS
Living room—oak plank. Bedrooms and halls—½ x 2 in. oak. Kitchen—1 x 4 in. fir, covered with linoleum. Bathrooms—tile.
WALL COVERINGS
Bedrooms—wallpaper. Bathrooms—lacquered wallpaper.
WOODWORK
Trim, shelving and cabinets—fir. All doors—white pine. Garage doors—fir, overhead type.
HARDWARE
Interior and exterior—brass.
PAINTING
All painting—3 coats lead and oil.
ELECTRICAL INSTALLATION
Wiring system—knob and tube. Switches—tumbler, Hart & Hegeman. Fixtures—Luminaire, brass and pewter, Westinghouse Electric & Manufacturing Co.
KITCHEN EQUIPMENT
Range—gas. Refrigerator—General Electric Co.
BATHROOM EQUIPMENT
Seat—C. F. Church Manufacturing Co. All other fixtures by Standard Sanitary Manufacturing Co.
PLUMBING
Pipes—wrought iron, A. M. Byers Co.
HEATING
Hot air unit, gas fired furnace.
SPECIAL EQUIPMENT
Venetian blinds—Columbia Mills.

ENTRANCE DETAIL



STUDY

7. APARTMENT AND GARAGE FOR MRS. R. D. RAMSEY, SHREVEPORT, LA.

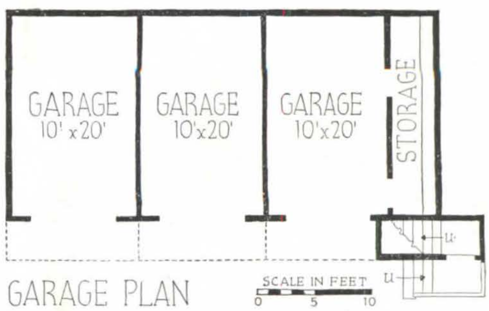


WILLIAM B. WIENER, ARCHITECT

An interesting experiment in the combining of garage and living facilities. The cantilevered second floor subordinates the garage and relieves the severity of the mass.

The architect comments: "This garage apartment was built at the rear of a duplex apartment. The owner now uses this for her living quarters and rents both of the apartments in the duplex."

Cost: $2,376.



CONSTRUCTION OUTLINE

FOUNDATION: Brick piers, concrete footings.

STRUCTURE: Exterior walls—siding on 2x4 in. studs, 24 in. o.c.; T. & G. shiplap, wallpaper on canvas. Floor construction—oak, 2 x 10 in. joists, 24 in. o.c.

ROOF: Construction—sheathing on roof joists, covered with built-up roofing.

WINDOWS: Sash—pine, double hung. Glass—double strength, quailty A. Screens—copper in wood frames.

STAIRS: Treads—oak. Risers—pine.

FLOORS: Living room, bedrooms and halls—oak. Kitchen—pine covered with linoleum. Bathrooms—covered with 1/8 in. sheet rubber.

WOODWORK: Trim, shelving and cabinets—pine. Interior doors—1 3/8 in. stock. Exterior doors—1 3/4 in. panel.

HARDWARE: Interior and exterior—dull nickel.

PAINTING: All painting—3 coats lead and oil. Floors—3 coats varnish.

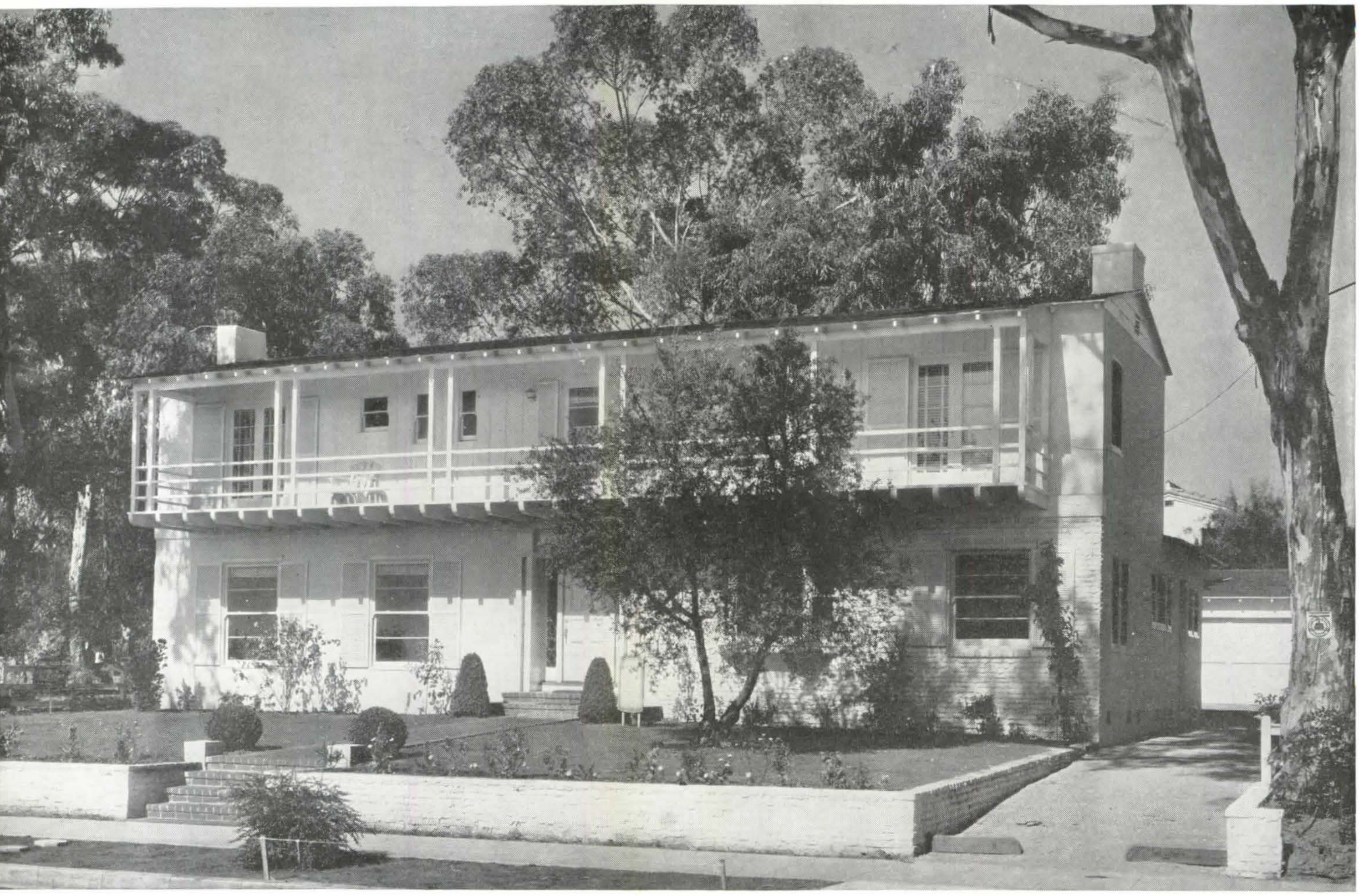
ELECTRICAL INSTALLATION: Wiring system—knob and tube. Switches—toggle type, Bakelite. Fixtures—flush, built-in.

BATHROOM EQUIPMENT: Shower and metal cabinet, Henry Weiss Manufacturing Co., Inc. All other fixtures by Standard Sanitary Manufacturing Co.

PLUMBING: Pipes—copper tubing.

HEATING: Gas outlets in all rooms.

8. HOUSE FOR W. E. STONE, HUNTINGTON PALISADES, CALIFORNIA



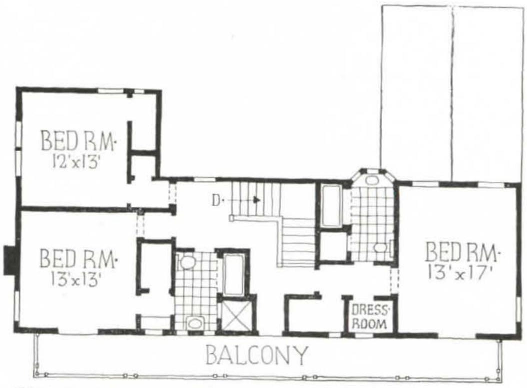
Don Milton

SAUL H. BROWN, ARCHITECT

The long balcony, built to take advantage of an ocean view, serves much the same purpose esthetically as the overhang of the building on the facing page. Plan, exteriors, and landscaping are consistently simple and attractive.

The architect comments: "The feature of the house is that the main rooms and balcony have an unobstructed view of the ocean. Materials are plaster and wood, commonly used in the locality. No unusual problems as to family requirements or layout were encountered. The owner has found satisfaction in the orientation, which permits the sun to enter all rooms."

Cubage: 64,000. Cost: $12,000 at 19 cents per cubic foot.



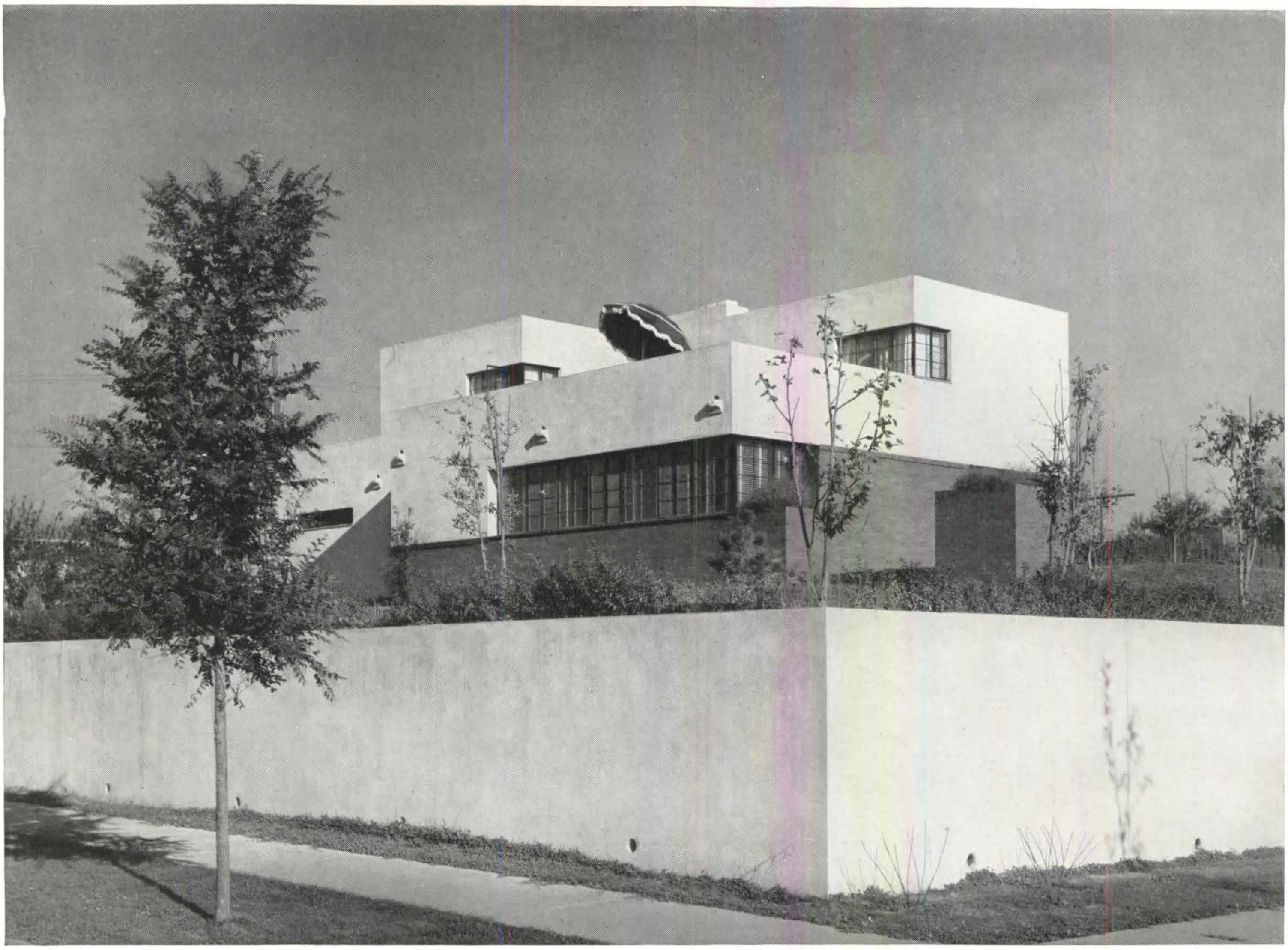
SECOND FLOOR

CONSTRUCTION OUTLINE

FOUNDATION: Walls—cement. Waterproofing—Anti-Hydro Waterproofing Co.
STRUCTURE: Exterior walls—stucco on wood studs. Inside—plaster on rock lath.
ROOF: Pre-dipped shingles, Samuel Cabot, Inc.
SHEET METAL WORK: Flashing and gutters—Armco, American Rolling Mills Co.
INSULATION: Outside walls, ground floor and roof—Celotex, The Celotex Co.
WINDOWS: Sash—wood, double hung. Glass quality A, Libbey-Owens-Ford Glass Co.
FLOORS: Living room, bedrooms and halls— x 1½ in. clear oak, Western Hardwood Mfg. Co. Kitchen—linoleum, Armstrong Cork Products Co. Bathrooms—tile.
WALL COVERINGS: All rooms—Sanitas, Standard Textile Products Co.
WOODWORK: Trim, cabinets and doors—pine.
HARDWARE: Interior and exterior—Schlage Lock Co.
PAINTING: All paint material by National Lead Co.
ELECTRICAL INSTALLATION: Wiring system—conduit. Switches—Bryant Electric Co.
KITCHEN EQUIPMENT: Stove—Wedgewood, James Graham Manufacturing Co. Refrigerator—Electrolux, Servel Sales, Inc.
PLUMBING: All fixtures by Standard Sanitary Manufacturing Co. Pipes by A. M. Byers Co.
HEATING: Furnace—Payne Furnace & Supply Co.

FIRST FLOOR

9. HOUSE IN DENVER, COLORADO



Hyskell-Denver Photos

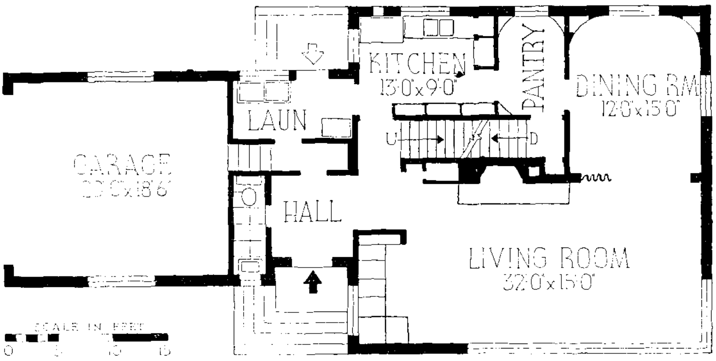
An unusually successful small house, interesting in mass and materials, and well adapted to the climate. The retaining wall, a practical expedient, is also attractive.

The architect comments: "The site is a hill top, located at the intersection of two main avenues. The traffic, combined with building restrictions, dictated the placing of the house far back on the lot. Brick and timber were selected as the cheapest and most suitable local materials. The plan developed naturally from the site requirements and the budget; the largest and fewest rooms possible were designed to reduce both upkeep and housekeeping.

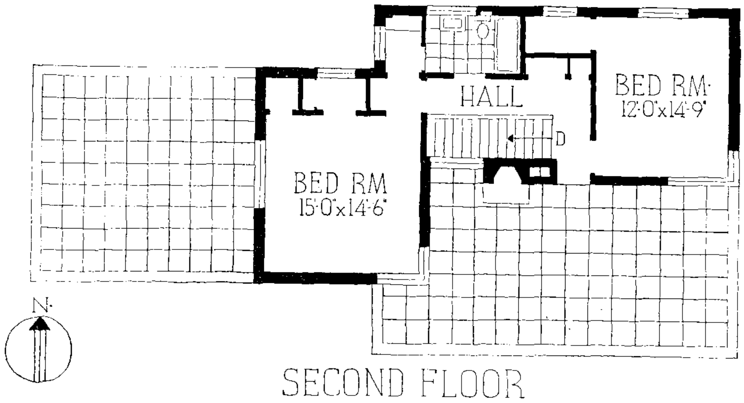
"Our family is small and will require at the most one servant, but provision is made for adding an additional bedroom and bath over the garage. We felt that the plan should be kept long and narrow to ensure cross ventilation and maximum sunlight. The best exposure is southeast and corner windows were a natural result. Because of traffic dangers, as much ground area as possible was preserved by the erection of a retaining wall, thus eliminating useless slopes. More privacy and safety were secured by a deck on the second floor. It commands a view of the Rockies, and because of its desirability as an outdoor living room in this dry climate, the deck was made accessible to the hall, no private room being a thoroughfare to it.

"The laundry was placed on the main floor adjacent to the kitchen, accessible to both drying yard and to the garage, which can be used in rainy weather. The overhead garage door is mechanically operated by remote control and has proven a great convenience. Dressing rooms throughout are heated for use separate from bedrooms."

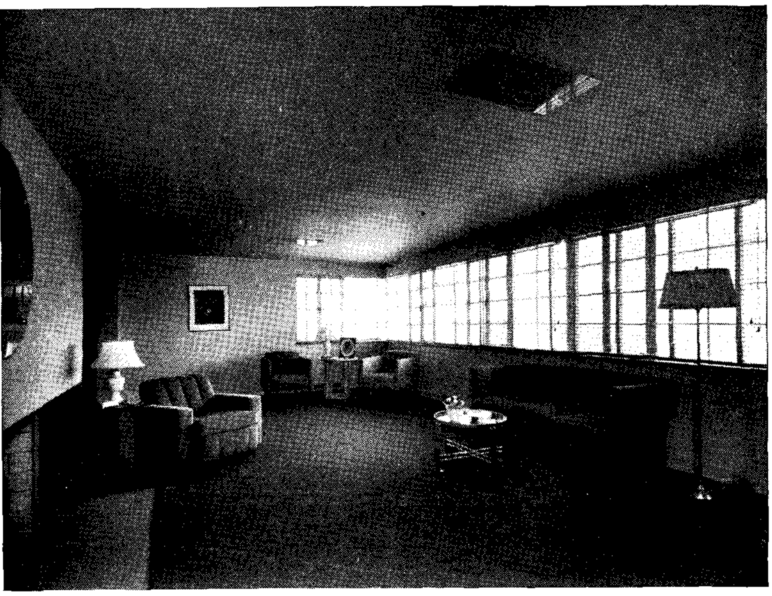
Cubage: 36,000. Cost: approximately $13,000 at about 36 cents a cubic foot.



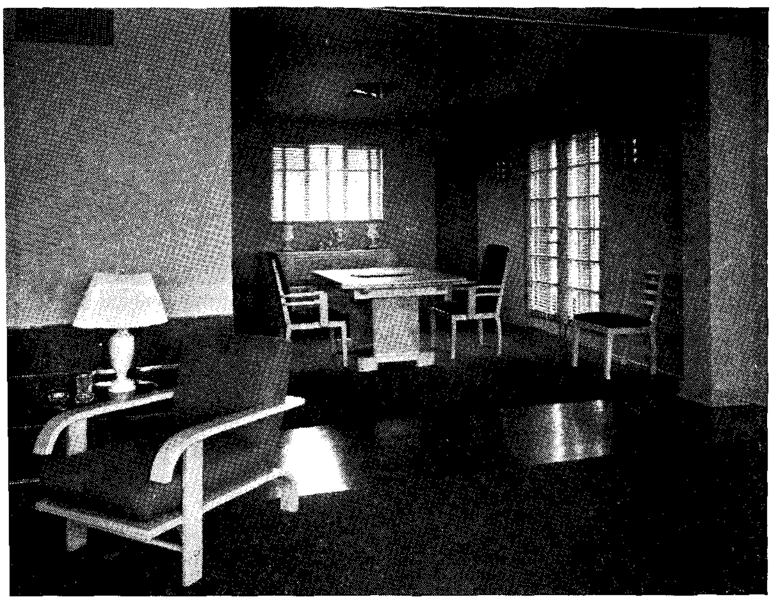
FIRST FLOOR



SECOND FLOOR



LIVING ROOM



DINING ROOM

CONSTRUCTION OUTLINE

FOUNDATION
Concrete, 12 in., continuous. Waterproofing—tar on cellar walls.

STRUCTURE
Exterior walls—3 coats stucco and face brick on 12 in. solid brick walls. Interior partitions and ceiling—3 coats plaster on metal lath. Floor construction—2 x 10 in. joists; 12 in. o. c. first floor; 16 in. o. c. second floor, sub- and finished floor.

ROOF
Construction—2 x 8 in. ripped diagonal, nailed to joists, covered with sheathing, 5-ply mopped composition roofing and gravel top. Deck construction—cypress.

CHIMNEY
Combination brick, lined with square tile. Damper—The Majestic Co.

SHEET METAL WORK
Flashing and gutters—galvanized tin.

INSULATION
Ground floor—balsam wool quilt, Wood Conversion Co. Roof—4 in. rock wool, spread between joists. Weather-stripping—Chamberlin Metal Weatherstrip Co.

WINDOWS
Metal casement, Truscon Steel Co. Glass—double strength, quality A, Pittsburgh Plate Glass Co.

FLOORS
Common oak throughout. Kitchen—covered with linoleum. Bathrooms—oak parquet block and one tile.

WALL COVERINGS
Bedrooms and first floor bath—wallpaper. Second floor bath—tile wainscot.

WOODWORK
Trim, shelving, cabinets and exterior doors—pine. Interior doors—birch slab.

HARDWARE
Interior and exterior—P. & F. Corbin.

PAINTING
All paint by John P. Hughes Co., Denver, Colo.

ELECTRICAL INSTALLATION
Wiring system—rigid metal hollow conduit. Switches—tumbler. Fixtures—recessed glass panels throughout.

KITCHEN AND LAUNDRY EQUIPMENT
Stove—Norge Corp. Refrigerator—Westinghouse Electric & Manufacturing Co. Sinks—Crane Co.

BATHROOM EQUIPMENT
Toilet—Standard Sanitary Manufacturing Co. All other fixtures—Crane Co.

PLUMBING
Pipes: Soil, and waste—galvanized iron. Water supply—copper.

HEATING AND AIR CONDITIONING
Warm air, gas furnace, Bryant Heater Co. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—Keystone, Crane Co. Air conditioning—filtering, recirculating and humidifying.

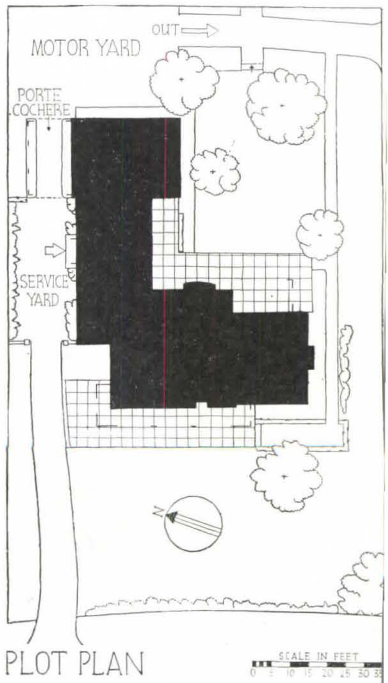
10. HOUSE FOR HALLETT W. MAXWELL, SAN MARINO, CALIF.

Stuart O'Brien Photos

The effect of climate is more apparent in the plan than in the exterior of this house. While the windows are of average size and conventional in placing, the plan shows the careful relation of the main rooms to the patio, and the facilities provided for outdoor dining and sleeping.

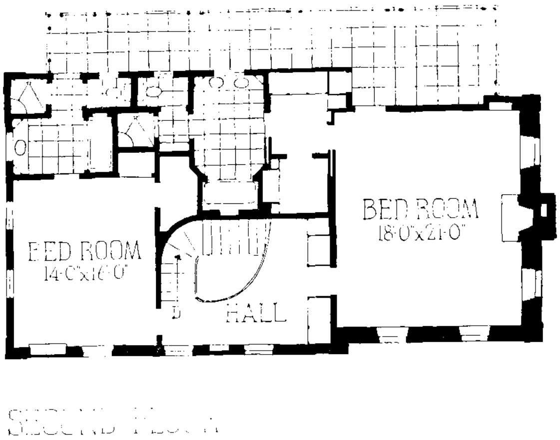
The architect comments: "San Marino has hot summers, so the house opens on a patio. The service wing is on the north side so that the kitchen may be cool in summer and the patio protected from the north winds in winter. The living room and owners' bedroom command a fine view across the San Gabriel valley. Living and dining rooms both connect with the garden porch, where outdoor meals are served. The bedrooms on the second floor open onto a long sleeping porch, which may be divided by a curtain; in the daytime it serves as an uninterrupted porch overlooking the garden."

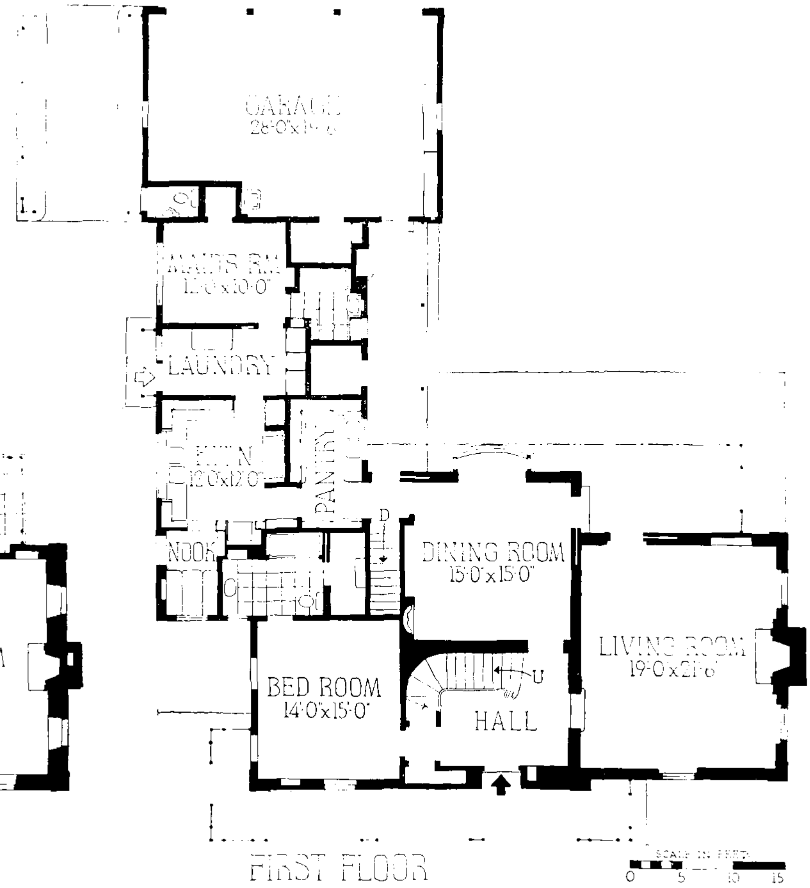
Cost: 29 cents a cubic foot.



PLOT PLAN

PORCH



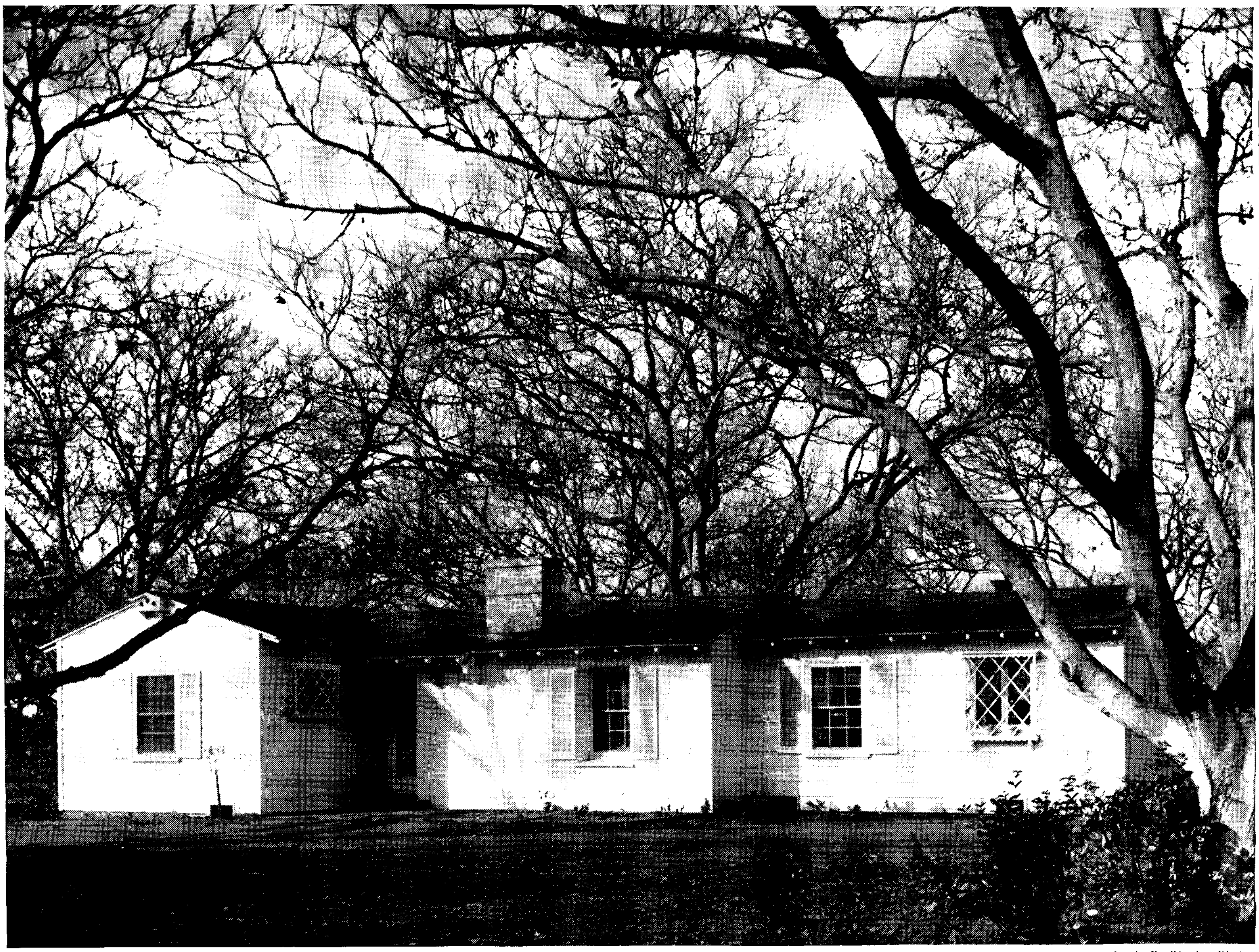


STAIR HALL

CONSTRUCTION OUTLINE

STRUCTURE
Exterior walls—cement plaster on 16 gauge 1½ in. wire over felt backed by 8 gauge wire horizontally strung 10 in. apart; wood studs, and furring.
ROOF
Rafters covered with redwood shingles. Deck—2 layers felt on sheathing, covered with slate surface roofing and Pabco Mastipave on common brick, The Paraffine Co., Inc.
INSULATION
Attic and first floor partitions—Celotex, The Celotex Co. Weatherstripping—Chamberlin Metal Weatherstrip Co., Inc.
WINDOWS
Sash—metal, double hung. Frame—Douglas fir, Druwhit Co. Glass—single strength, quality A, Libbey-Owens-Ford Glass Co. Screens—copper bronze.
HARDWARE
Bronze throughout, Russell & Erwin Manufacturing Co.
PAINTING
Interior: Walls—Wallhide, Pittsburgh Plate Glass Co., and Plastona, Matthews Paint Co. Ceilings—calcimine, The Reardon Co. Floors—stain, filler, shellac and wax. Trim and sash—enamel. Exterior: Walls—brush coat on cement plaster.
ELECTRICAL INSTALLATION
Wiring system—conduit. Switches—toggle, Hart & Hegeman.
KITCHEN AND LAUNDRY EQUIPMENT
Stove—Glenwood Range Co. Refrigerator—Frigidaire Co. Sinks—Washington-Eljer.
BATHROOM EQUIPMENT
Lavatory bowls and tubs—Washington-Eljer. Counter—Linotile covered, Armstrong Cork Products Co. Toilets—T N, one piece, W. A. Case & Son Manufacturing Co. Shower—tile. Cabinets—wood with copper back mirrors, Pittsburgh Plate Glass Co.
PLUMBING
Pipes: Soil and waste—cast iron. Water supply—galvanized iron.
HEATING
Payne gravity type unit furnaces, hot air, Payne Furnace & Supply Co.

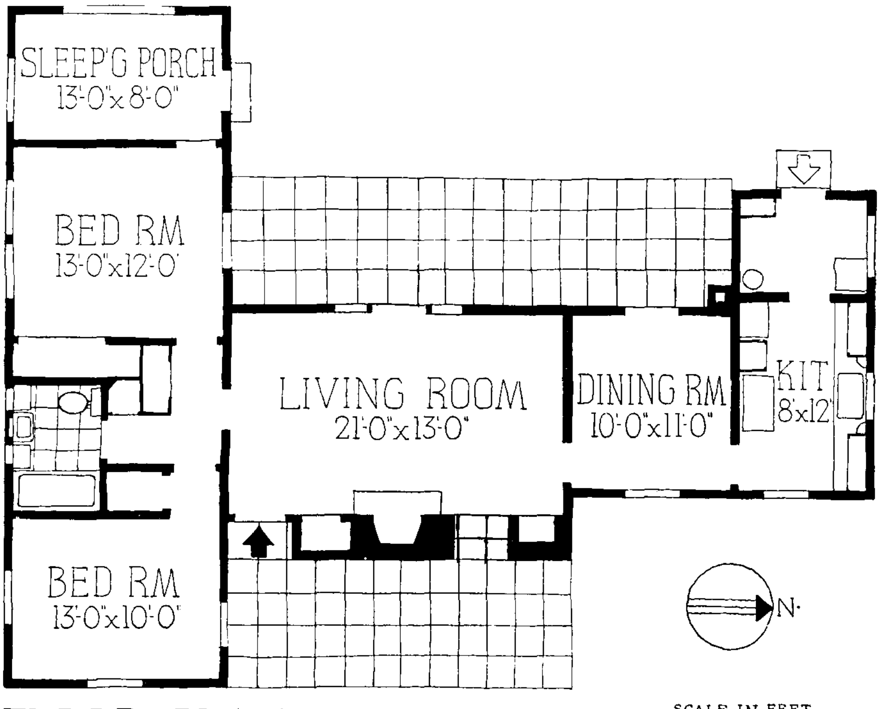
11. HOUSE FOR H. H. ROMINGER, EL MONTE, CALIF.



Louis B. Ziegler Photos

PROBLEM: To build an inexpensive house on a one-acre plot for a family of two adults and three children.

The house is situated approximately in the center of the plot, with the garage about 75 ft. to the rear. The setting of English walnut trees is an excellent illustration of the effect of surroundings on the appearance of a house. Further evidence of the importance of landscaping is the abruptness of the transition from house to grounds; terraces and planting are not only useful, they also serve to extend the house and to tie it in more closely with the plot on which it is set. The plan is well arranged, and the interiors are appropriately modest, showing the same use of wood as the exterior, and revealing the rafters and ties in the living room.
Cubage: 14,892. Cost: $4,300 at 29 cents a cubic foot.



FLOOR PLAN

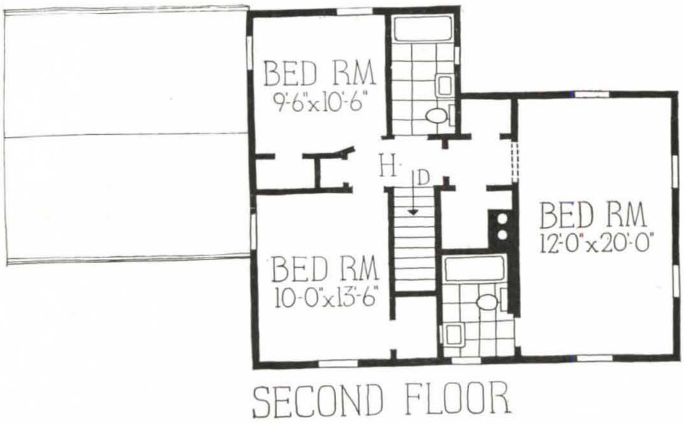
CONSTRUCTION OUTLINE

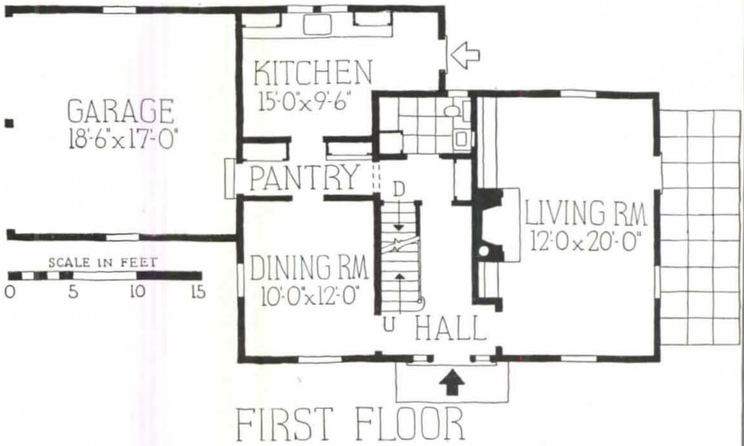
FOUNDATION
Walls—concrete, continuous.
STRUCTURE
Exterior walls—1 x 12 in. redwood siding over 10 lb. felt, studs, wood lath, integrally colored stucco. Floor construction—2 x 6 in. Douglas fir joists and 1 x 6 in. sub-floor. Ceilings—plank Celotex on exposed rafters, The Celotex Co.
ROOF
Construction—2 x 4 in. Douglas fir rafters, 1 x 4 in. sheathing, 5/2 cedar shingles.
CHIMNEY
Brick.
SHEET METAL WORK
Flashing and gutters—galvanized iron.
WINDOWS
Sash—double hung. Frame—sugar pine. Glass—Libbey-Owens-Ford Glass Co. Screens—galvanized wire in wood frame. Blinds—sugar pine, fixed slats.
FLOORS
Living room, bedrooms and halls—mahogany plank. Kitchen—linoleum, Armstrong Cork Products Co.
WOODWORK
Trim, shelving, cabinets and doors—pine.
HARDWARE
Interior and exterior—brass.
PAINTING
Interior: Walls, trim and sash—lead and oil paint and glaze. Floors—stain, fill and shellac. Exterior: Walls and sash—3 coats lead and oil. Roof—oil stain.
ELECTRICAL INSTALLATION
Wiring system—knob and tube. Switches—Hart & Hegeman toggle type. Fixtures—direct; brackets—brass finish.
KITCHEN EQUIPMENT
Range—gas. Refrigerator—Electrolux, Servel Sales Inc.
PLUMBING
All fixtures by Standard Sanitary Manufacturing Co. Soil and waste pipes—cast iron. Water supply pipe—galvanized iron.
HEATING
Gas, floor furnaces.

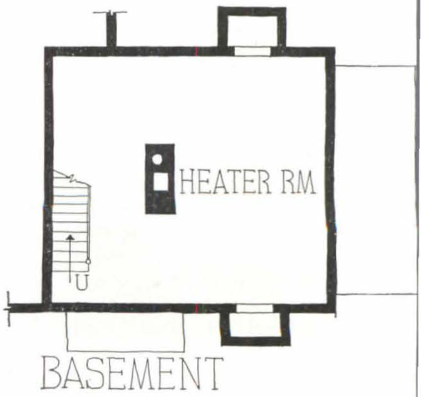
LIVING ROOM

12. HOUSE FOR F. A. BIDERMANN, CHAPPAQUA, N. Y.

John Gass Photos

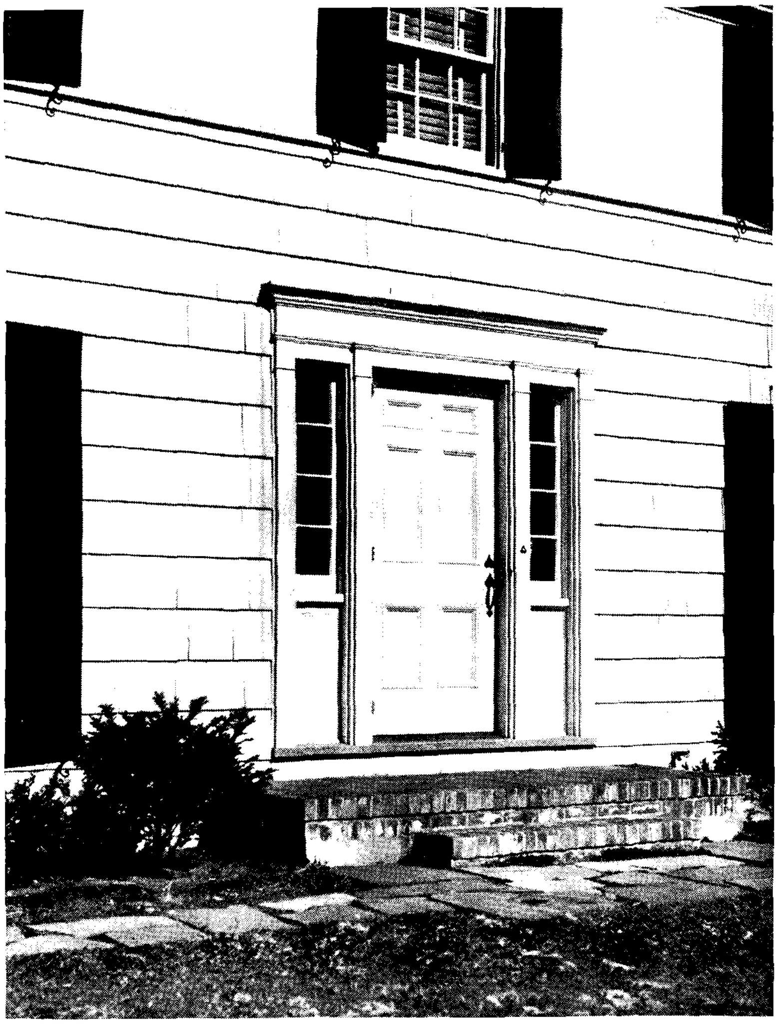






A conventional small house, both in exterior and plan, this residence is fortunate in its site, which contains an old orchard and is surrounded by woods. Outside of a pine paneled living room, designed as a setting for some early American furniture, and provisions for a number of electrical appliances, there were no special requirements.

Cubage: 23,500. Cost: $7,000, at 29 cents a cubic foot.



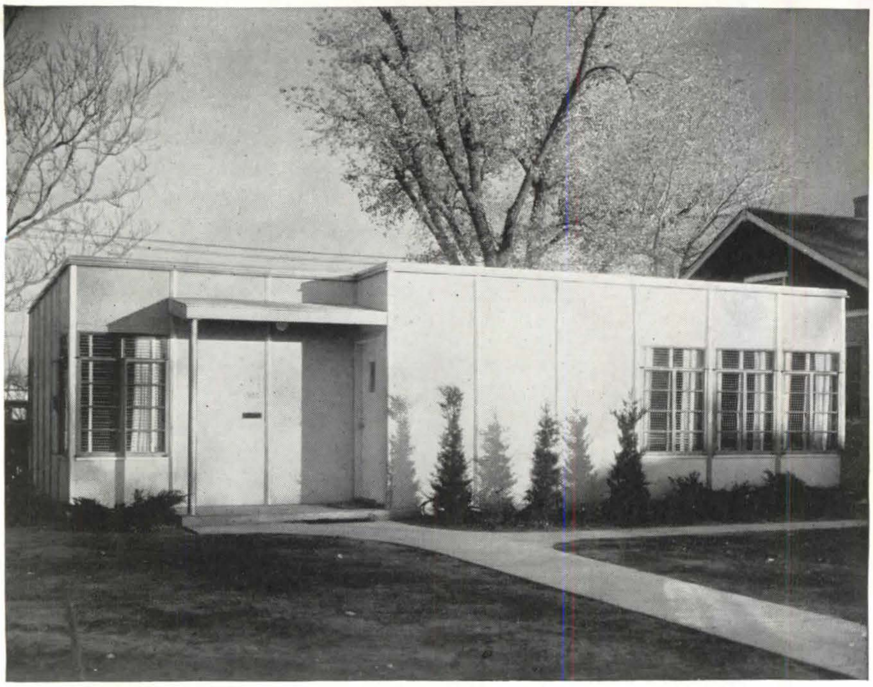
ENTRANCE DETAIL

LIVING ROOM

CONSTRUCTION OUTLINE

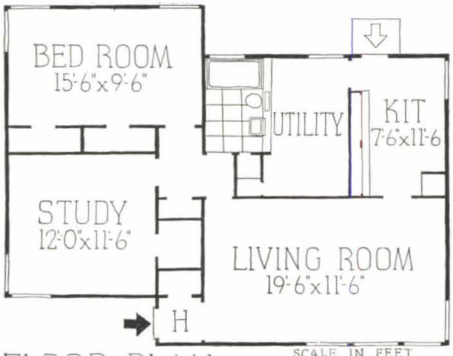
FOUNDATION
Walls—concrete blocks. Waterproofing—Anti-Hydro in cement finish, Anti-Hydro Waterproofing Co.
STRUCTURE
Exterior walls—24 in. Royal cedar shingles.
ROOF
Perfection cedar shingles, 18 in.
CHIMNEY
Brick, with H. W. Covert Co. damper.
SHEET METAL WORK
Flashing, gutters and leaders—copper.
INSULATION
Outside walls and attic floor—rock wool. Weather-stripping—zinc, bronze saddles.
WINDOWS
Sash—double hung. Glass—single strength, quality B. Screens—bronze wire in wood frame.
STAIRS
Treads—oak. Risers and stringers—pine.
FLOORS
Living room, bedrooms and halls—clear white oak. Kitchen—linoleum covered. Bathrooms—tile.
WALL COVERINGS
Living room, bedrooms and halls—wallpaper.
WOODWORK
Ponderosa pine throughout. Garage doors—overhead type, Stanley Co.
HARDWARE
Interior and exterior—Stanley Co.
PAINTING
Interior: Walls, trim and sash—lead and oil. Ceilings—calcimine. Floors—shellac and wax. Exterior: Walls and sash—lead and oil. Roof—creosote, Samuel Cabot, Inc.
ELECTRICAL INSTALLATION
Wiring system—Radiant, General Electric Co. Switches—General Electric Co.
KITCHEN EQUIPMENT
All by General Electric Co., except cabinet by Kitchen Maid Manufacturing Co.
LAUNDRY EQUIPMENT
Sink—Standard Sanitary Manufacturing Co. Washing machine—General Electric Co.
BATHROOM EQUIPMENT
All fixtures by Standard Sanitary Manufacturing Co.
PLUMBING
Pipes: Soil and waste—cast iron. Vent—wrought iron. Water supply—brass.
HEATING
A. B. C. oil burner, Automatic Burner Co. Radiators—concealed. Valves—Hoffman Specialty Co. Regulator—Minneapolis-Honeywell Regulator Co.

13. HOUSE FOR MRS. BERTHA K. HAMMOND, WICHITA, KANSAS



MELTON P. JOHNS, ARCHITECT

PROBLEM: To provide a fireproof, air conditioned house in the **$5,000** class for a widow living alone. Adequate guest accommodations were a requirement.



FLOOR PLAN

A solution here was found in a prefabricated house made by American Houses, Inc. The desired guest facilities are obtained by using the study and living room for sleeping. A ground floor utility room replaces the basement.

Cost: about $5,000.

CONSTRUCTION OUTLINE

STRUCTURE

Exterior walls—steel joists, studs, Pyrestos insulated wall panels, American Houses, Inc. Interior partitions—solid reenforced gypsum planks, American Cyanamid & Chemical Corp. (Structural Gypsum Div.).

ROOF

Built-up felt and asphalt covered with flint gravel top over gypsum planks.

SHEET METAL WORK

Aluminum cornice.

INSULATION

Floors and roof—mineral wool, U. S. Gypsum Co.

WINDOWS

Steel casement, weatherstripping by American Houses, Inc.

FLOORS

Main rooms—reenforced gypsum planks covered with Broadfelt carpeting, Clinton Carpet Co. Kitchen and bath—inlaid linoleum, Armstrong Cork Products Co.

KITCHEN EQUIPMENT

Sink and cabinets—Crane Co. Stove—Hot Point, Edison General Electric Appliance Corp.

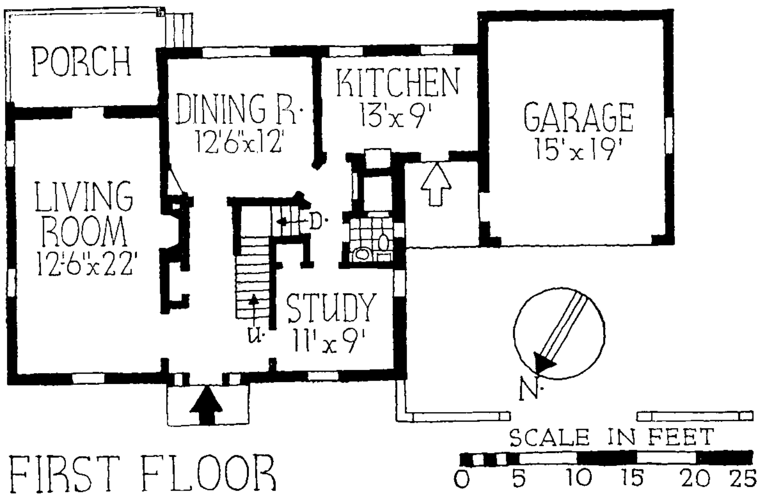
PLUMBING

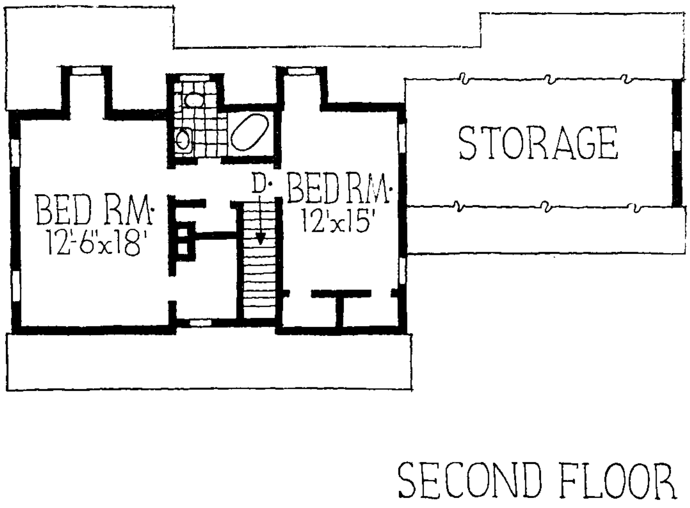
All fixtures by Standard Sanitary Manufacturing Co. Arcode built-in sections by Accessories Co. Pipes—copper.

HEATING AND AIR CONDITIONING

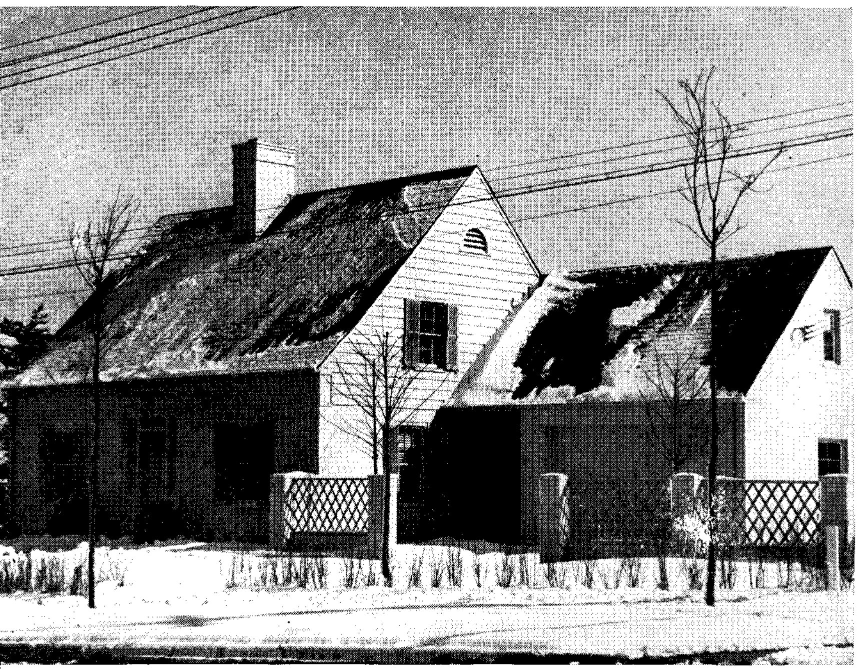
Direct gas fired heater, Bryant Heater Co., forced air circulation, Modine cooling plant with private wells beneath house, Modine Manufacturing Co. Thermostat and humidistat—Minneapolis-Honeywell Regulator Co.

14. HOUSE IN CHEVY CHASE, MD. DAN KIRKHUFF, ARCHITECT





A compact plan with ample rooms. The living oom gains wall space by the placing of the din- ng room off the hall, a convenient arrangement n a house of this size. There is a good relation between the garage and service entrance. The covered porch not only provides protection for deliveries, but serves as a passage into the house from the garage. It is of interest to note that while plans with garages at the front have been proposed for this development, they have invari- ably been turned down by the directors of the development and by the committee of residents. Cubage: 29,865. Cost: $10,450 at 35 cents a cubic foot.



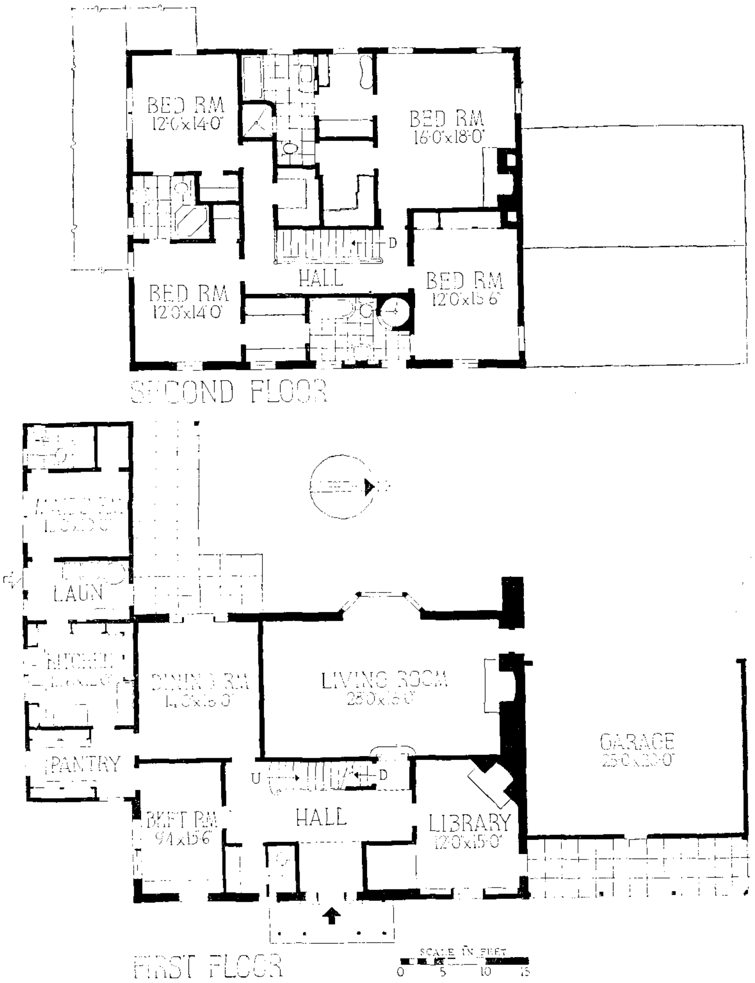
CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—painted common brick facing, 4 in. cinder concrete block backing, 1 in. wood furring strips, rock lath, plaster board, U. S. Gypsum Co., and 3 coats plaster. Floor construction—2 x 10 in. fir joists, diagonal sub-floor. Ceilings—rock lath and plaster, U. S. Gypsum Co.
ROOF: Construction—2 x 8 in. rafters and sheathing, covered with roofing felt and 3-16 in. slate.
INSULATION: Second story and roof—4 in. rock wool.
WINDOWS: Double hung, Silentite frames and sash, prefabricated with bronze weatherstripping, The Curtis Companies. Casements—Fenestra steel, with metal frame bronze wire screens, Detroit Steel Products Co.
FLOORS: Living room, bedrooms and halls—13/16 in. clear white pine. Kitchen and bathrooms—inlaid heavy gauge linoleum, Congoleum-Nairn, Inc.
WALL COVERINGS: Bedrooms and halls—wallpaper. Bathrooms—Marlite, Marsh Wall Products Co.
WOODWORK: Trim, shelving and cabinets—white pine, special. Doors—Colonial, six raised panels, The Curtis Companies. Garage doors—Overhead Door Corporation.
HARDWARE: Interior and exterior—P. & F. Corbin.
PAINTING: Walls, trim and sash—3 coats lead and oil. Ceilings—Texolite, U. S. Gypsum Co. Floor—dark stain and wax. Exterior walls—2 coats Bay State brick paint, Wadsworth, Howland & Co., Inc.
ELECTRICAL INSTALLATION: Wiring system—BX. Switches—Bryant Electric Co. Fixtures—stock.
KITCHEN EQUIPMENT: Stove and refrigerator—General Electric. Sink—Monel Metal, International Nickel Co.
BATHROOM EQUIPMENT: Seat—C. F. Church Mfg. Co. Cabinets—Lawco, F. H. Lawson Co. All other fixtures by Standard Sanitary Mfg. Co.
PLUMBING: Pipes—cast iron and streamline copper tubing, Mueller Brass Co., Streamline Pipe & Fittings Division.
HEATING AND AIR CONDITIONING: Winter air conditioning, oil burning furnace, Gar Wood Industries.

15. HOUSE FOR RAYMOND C. MOORE, WESTWOOD HILLS, CALIF.

Miles Berne Photos

The property for this residence was picked because of its eastern exposure and the beauty of the surrounding hills. The use of stone recalls the early domestic work of Pennsylvania and New Jersey, but it should be noted that there has been little attempt to follow any stylistic precedent. The plan is a compact rectangle, with services confined to an adjoining wing, an arrangement which gives more light to these quarters than is customarily the case. The unusual shower enclosure is of tile, and is circular because the architect has found this shape more convenient for a corner stall than a square. Cubage: 54,000. Cost: $18,750 at 35 cents a cubic foot.



CONSTRUCTION OUTLINE

STRUCTURE
Exterior walls—Palos Verde stone veneer, wood siding, Oregon pine studs and plaster. Floor construction: First floor—$\frac{13}{16}$ x 4 in. oak plank over 1 x 6 in. Oregon pine sub-floor. Second floor—$\frac{1}{2}$ x 2 in. clear white oak over same sub-floor.

ROOF
Covered with soft grain redwood shingles.

CHIMNEY
Lining—8 in. brick, Los Angeles Brick Co. Damper—Superior Fireplace Co. Weatherstripping—Anaconda copper, American Brass Co.

WINDOWS
Sash and frame—double hung, pine, Southwest Sash & Door Co. Glass—single strength, quality A, Libbey-Owens-Ford Glass Co.

FLOORS
Kitchen—Oregon pine, covered with standard gauge linoleum, Armstrong Cork Products Co. Bathrooms—tile, Gladding, McBean & Co.

HARDWARE
Interior and exterior—Pioneer Hardware Co. Garage doors—overhead type, Reliable Door Co.

PAINTING
Interior—4 and 5 coats paint, Tibbetts-Carr Co. Floors—stain, 2 coats shellac, California Hardwood Floor Co. and wax, S. C. Johnson & Son, Inc. Roof—1 coat pure linseed oil, Tibbetts-Carr Co.

ELECTRICAL INSTALLATION
Wiring system—Anaconda wire, American Brass Co., Steeltubes, Steel & Tubes, Inc. Switches—Bryant Electric Co. Fixtures—direct.

KITCHEN AND LAUNDRY EQUIPMENT
Stove—Magic Chef, American Stove Co. Refrigerator—Frigidaire Sales Corp. Sinks—Standard Sanitary Manufacturing Co. Washing machine—General Electric Co.

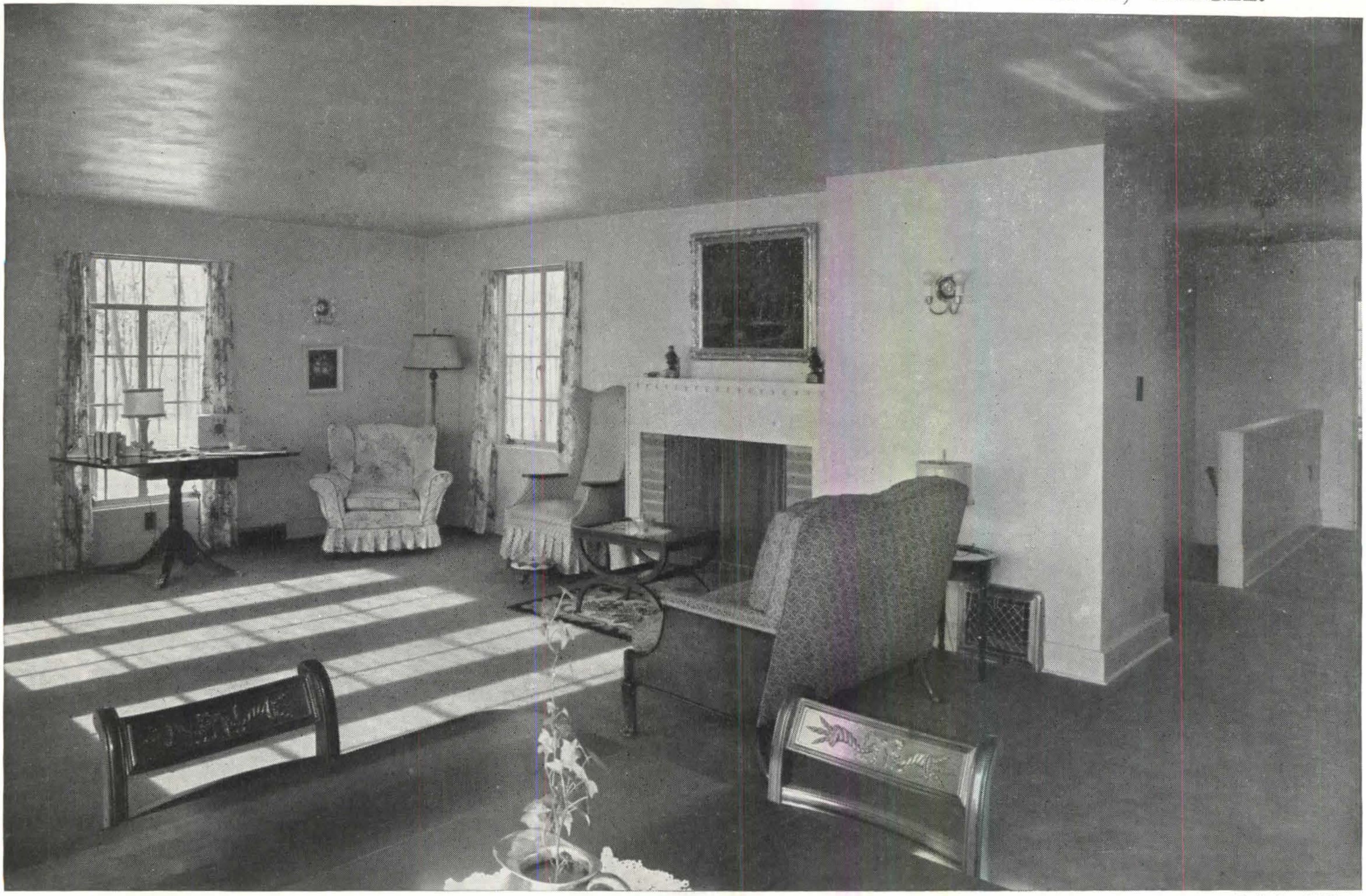
BATHROOM EQUIPMENT
Seat—C. F. Church Manufacturing Co. All other fixtures—Standard Sanitary Manufacturing Co.

HEATING
Warm air, gas furnace, Payne Furnace & Supply Co. Hot water heater—Crane Co.

MASTER BEDROOM

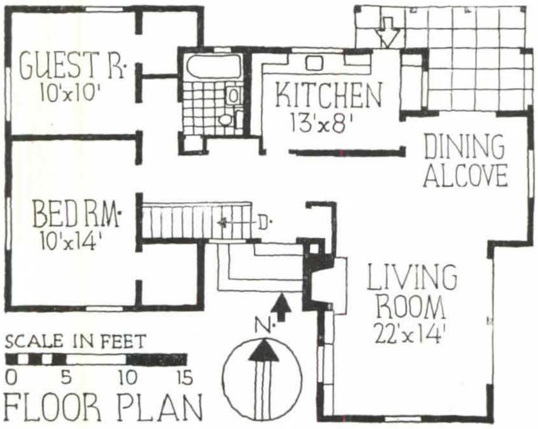
LIBRARY DETAIL

16. HOUSE FOR H. OWEN GOSLIN, ST. MARY'S LANE, MICH.

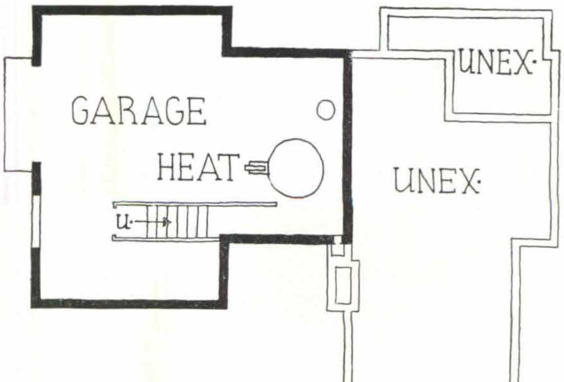


LIVING ROOM

Y. T. Suzuki Photos



FLOOR PLAN

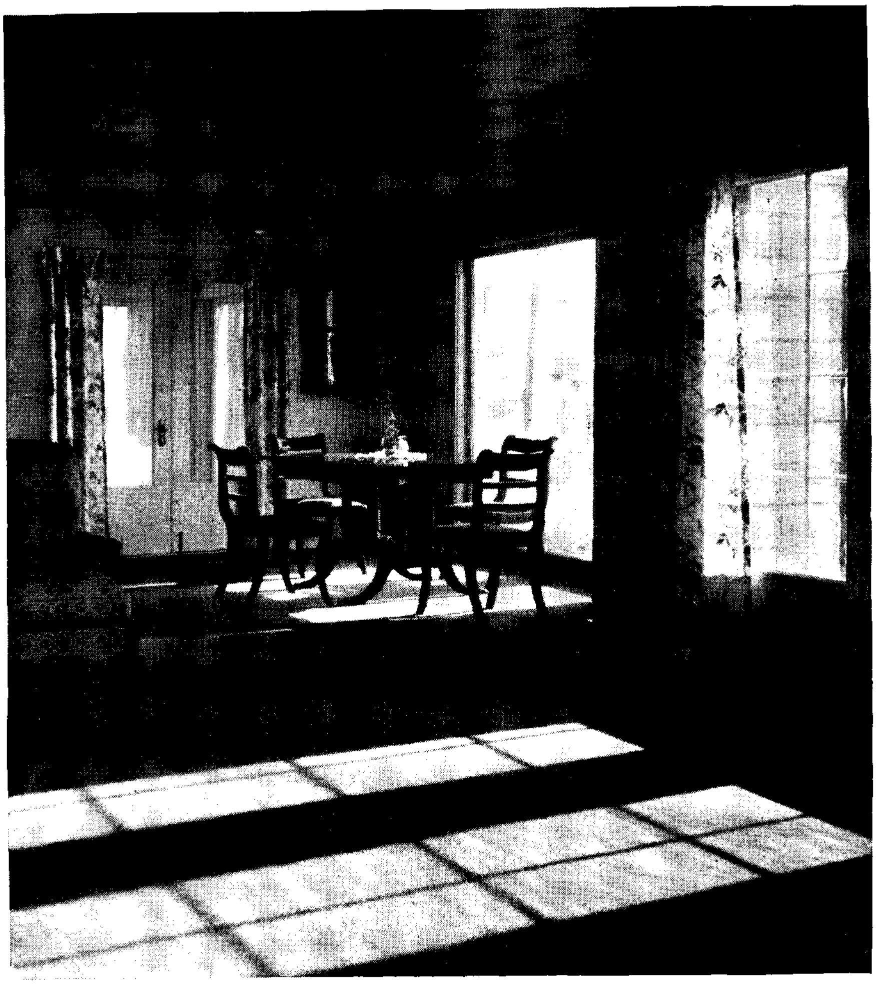


BASEMENT

The house reflects the owners' simple requirements. The plan is laid out with a minimum of partitions, and the size of the house is no greater than that of a typical servantless apartment. The advantages of the open plan, and the effect of spaciousness it provides in a small house, are well illustrated by the photographs.

The architect comments: "The house was built for two young people who expect to occupy it for about 15 years. The plan has been so arranged that another bedroom may be added on the north side if the future size of the family requires it. No arrangement for the accommodation of servants has been made."

Cubage: 18,270. Cost: $4,310 at 23½ cents a cubic foot.



DINING ALCOVE

CONSTRUCTION OUTLINE

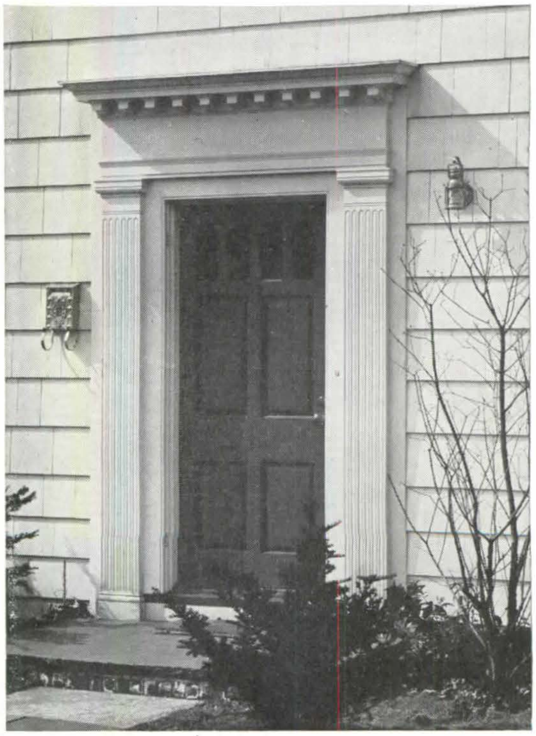
FOUNDATION
Walls—concrete block. Cellar floor—concrete. Waterproofing—Ruberoid Co.
STRUCTURE
Exterior walls—asbestos shingles and sheathing paper, Ruberoid Co., ¾ in. yellow pine sheathing, 2 x 4 in. yellow pine studding, ½ in. Insulite Co., lath and plaster, U.S. Gypsum Co. Interior partitions—½ in. Insulite lath and plaster on studs.
ROOF
Asbestos shingles and sheathing paper, insulated with rock wool, Ruberoid Co.
CHIMNEY
Lining—Robinson Clay Products Co. Fireplace—damper, The Majestic Co.
SHEET METAL WORK
Flashing, gutters and leaders—Armco galvanized iron, American Rolling Mill Co.
WINDOWS
Sash—Fenwrought screened casements, Detroit Steel Products Co. Weatherstripping—Chamberlain Metal Weatherstrip Co.
FLOORS
Living room and halls—½ in. Insulite board, Insulite Co., carpet, L. C. Chase Co. Bedrooms and bathrooms—¾ x 2¼ in. third grade red oak. Kitchen—½ in. Insulite board, Insulite Co., linoleum, Armstrong Cork Products Co.
WALL FINISH
Walls throughout sand finish plaster tinted.
WOODWORK
Trim and doors—white pine. Shelving—redwood.
HARDWARE
Interior and exterior—Russell & Erwin Mfg. Co.
PAINTING
Interior and exterior—Velour paint, Devoe & Raynolds Co., Inc.
ELECTRICAL INSTALLATION
Wiring system—armored cable, General Electric Co. Switches—Harvey Hubbell. Fixtures—Chase Brass & Copper Co.
KITCHEN EQUIPMENT
Stove—A-B Stove Co. Refrigerator—Frigidaire Sales Corp. Sink—double compartment, Standard Sanitary Mfg. Co. Cabinet—Nappanee, Coppes, Inc.
PLUMBING
All fixtures by Standard Sanitary Mfg. Co. Soil, waste and vent pipes—cast iron, Alabama Pipe Co. Water supply pipe—steel, National Tube Co. Pump—350 gal. per hour capacity, F. E. Myers & Brothers Co.
HEATING
Warm air—Marshall Furnace Co. Hot water heater—Graybar Electric Co.

ENTRANCE

KITCHEN

17. HOUSE FOR H. JACKSON SILLCOCKS, TUCKAHOE, N. Y.

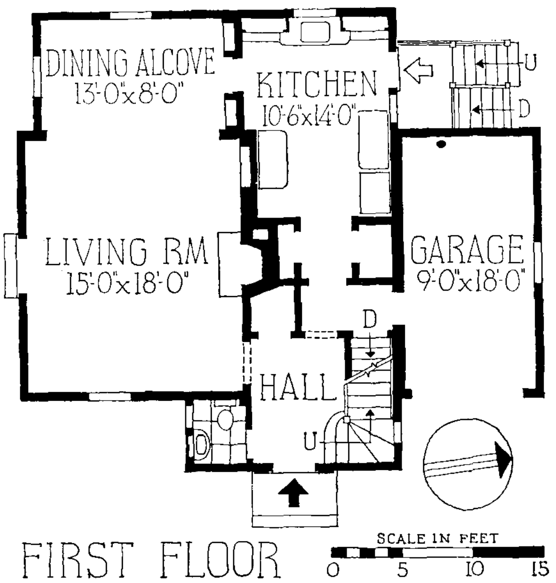
John Gass Photos



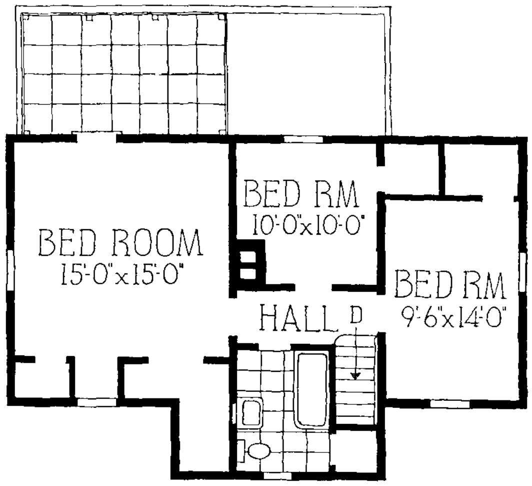
ENTRANCE DETAIL

PROBLEM: To build the first of a proposed series of houses, designed for young married couples with moderate incomes; to set up in this first house architectural standards which would control those to follow.

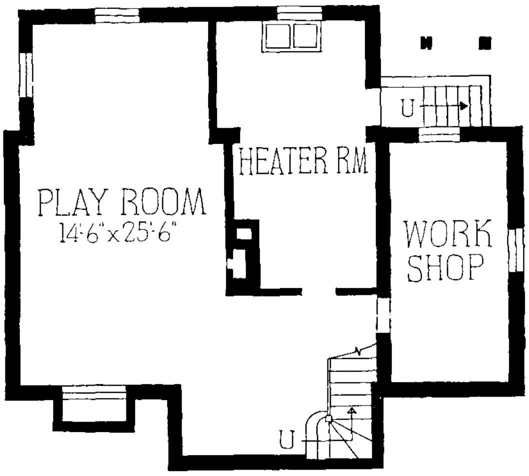
More than usual care in all of its details has added much to the appearance of the house. A terrace off the living room provides for an extension of its uses in the summer, and living room and dining room have been merged to increase the spaciousness of an otherwise small interior. A deck on the second floor faces the rear for privacy, and is further protected by the trees at the edge of the property. This house, originally designed for an operative builder, George N. Schmiedel, was sold shortly after its completion and has already been followed by two others. Cubage: 24,000. Cost $10,728 at 45 cents a cubic foot.



FIRST FLOOR



SECOND FLOOR



BASEMENT

LIVING-DINING ROOM

CONSTRUCTION OUTLINE

FOUNDATION
Walls—concrete block, continuous. Waterproofing—⅝ in. coat waterproof, Medusa Portland Cement Co.
STRUCTURE
Exterior walls—random width shingles, 10 in. exposure, building paper, sheathing, studs, insulation, wire lath and plaster. Floor construction—wood joists, wire lath and plaster.
ROOF
Construction—wood rafters, sheathing, felt, covered with black slate, Bangor Slate Association, Inc. Deck construction—canvas.
CHIMNEY
Lining—terra cotta. Damper—H. W. Covert Co.
SHEET METAL WORK
Flashing and leaders—copper. Gutters—long fir wood.
INSULATION
Outside walls—rock wool, Eagle-Picher Lead Co. Attic floor—rock wool and down knee walls.
WINDOWS
Sash and frame—Silentite, The Curtis Companies. Glass—glazing by The Curtis Companies. Screens—bronze in white pine frame.
FLOORS
Living rooms, bedrooms and halls—white oak, Ritter Floor Co. Kitchen—linoleum, Armstrong Cork Products Co. Bathrooms—tile, American Encaustic Tile Co.
WALL COVERINGS
Living room and halls—wallpaper, Imperial Wall Paper Co. Bedrooms—wallpaper, Richard E. Thibaut Co.
WOODWORK
Trim and doors—white pine, stock types, The Curtis Companies. Shelving and cabinets—white pine. Garage doors—Overhead Door Co.
HARDWARE
Interior and exterior—Yale & Towne Manufacturing Co.
PAINTING
All paint by Keystone Varnish Co.
ELECTRICAL INSTALLATION
Wiring system—BX, National Electric Products Co. Fuze panel—Columbia Metal Box Co. Switches—Hart & Hegeman. Fixtures—Cassidy & Co.
KITCHEN EQUIPMENT
Stove—General Electric Co. Cabinet—Oxford, Bradley Co.
BATHROOM AND LAUNDRY EQUIPMENT
Seat—C. F. Church Manufacturing Co. Cabinet—Hoegger, Inc. All other fixtures—Standard Sanitary Manufacturing Co.
PLUMBING
Pipes: Soil and waste—extra heavy cast iron, Crane Co. Water supply—Anaconda brass—American Brass Co.
HEATING AND AIR CONDITIONING
Two pipe vapor system, oil burner and thermostat, General Electric Co.

18. HOUSE FOR GEORGE HARLOWE, OAKLAND, CALIF.

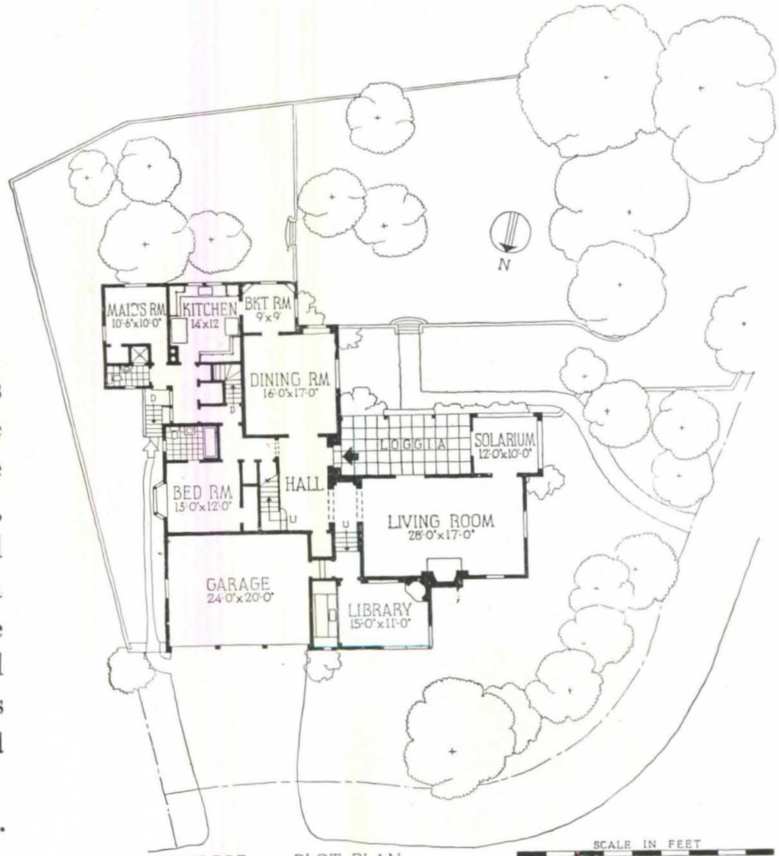
SECOND FLOOR

BASEMENT

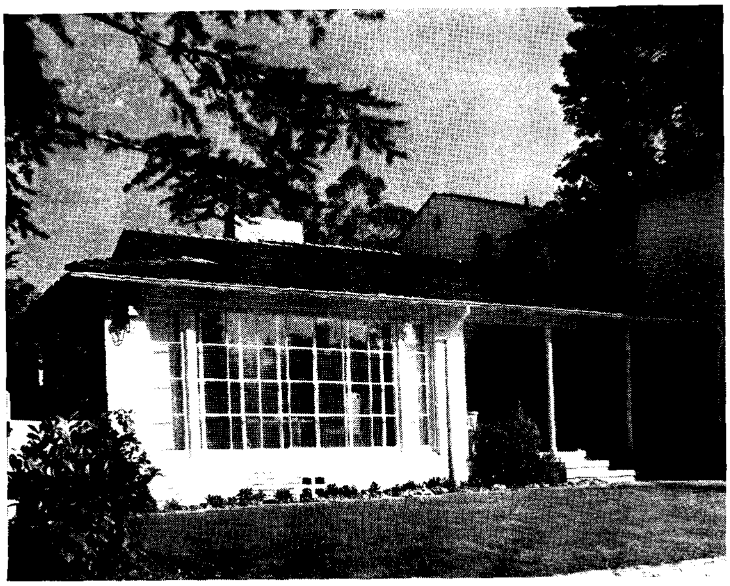
PROBLEM: To provide privacy for outdoor living on a corner lot. Accommodations for a family with one son and two daughters.

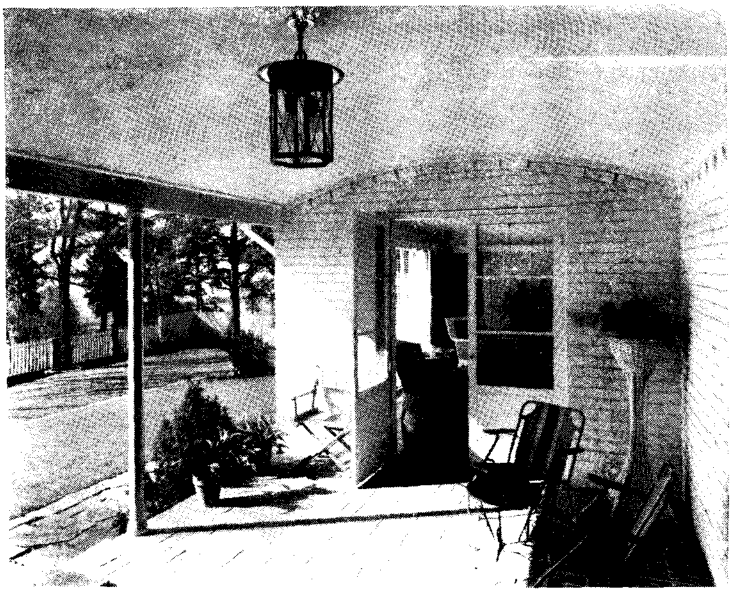
As shown in the plan, the problem of privacy was solved by the brick garden wall which shuts off the rear garden from the street. Since the rear of the house faces south, the plan has been arranged accordingly, and the photograph above shows how this is expressed by the blank wall on the first floor, broken only by a corner window and the garage door. The views of the garden side show an excellent use of porch space and large glass areas. The garden, laid out in two levels, is protected by trees at its southern boundary, and is further enclosed by a picket fence.

Area (including basement and garage): 5,707 sq. ft.
Cost: $19,000 at $3.33 a square foot.



FIRST FLOOR AND PLOT PLAN





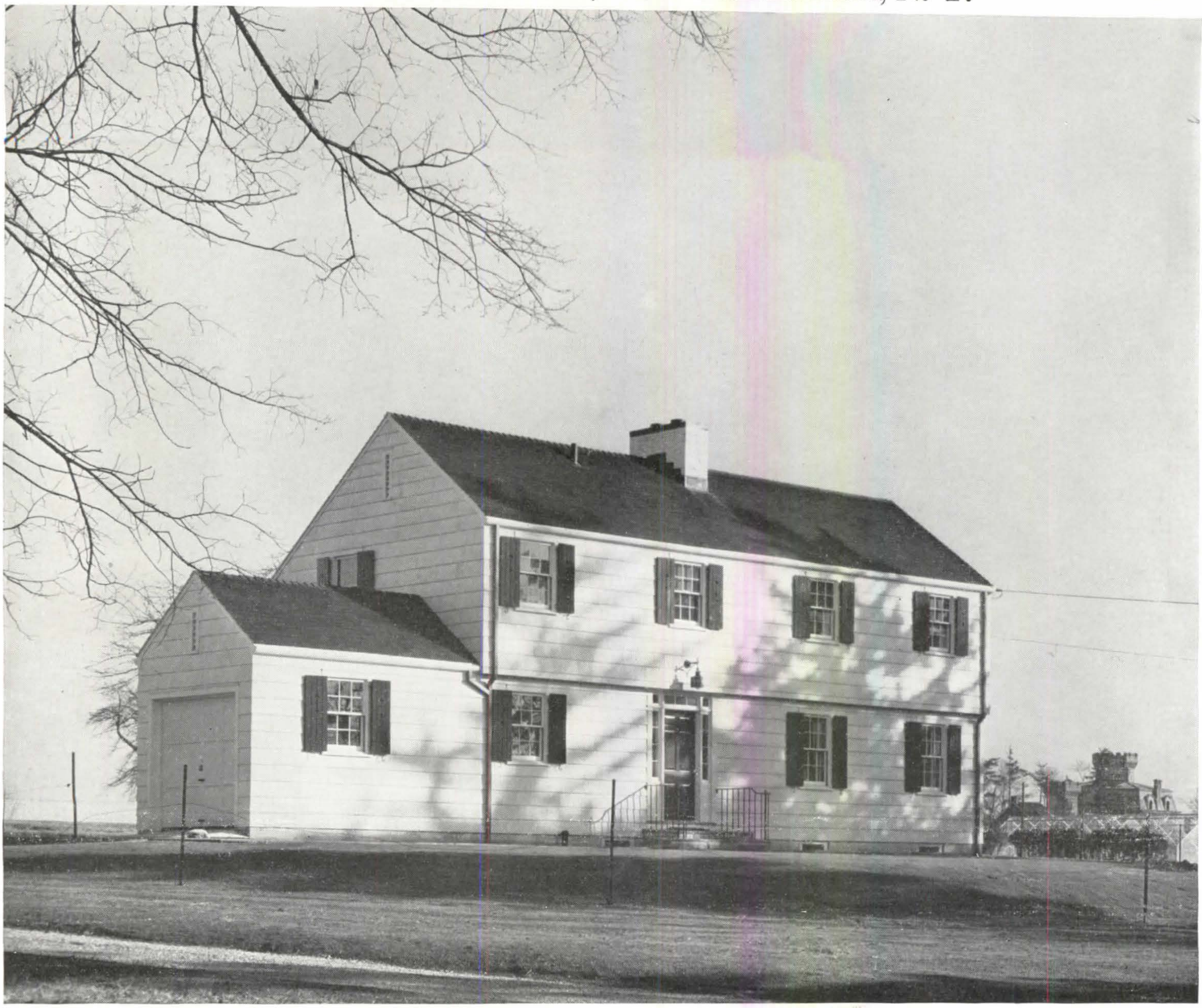
SOLARIUM AND LOGGIA

LIVING ROOM

CONSTRUCTION OUTLINE

FOUNDATION
Walls—concrete. Waterproofing—concrete mix, 2 coats tar on exterior foundation walls.
STRUCTURE
Exterior walls—brick veneer, plaster, building paper, sheathing and studs. Interior partitions—wood lath and plaster.
ROOF
Covered with cedar shakes.
CHIMNEY
Lining—terra cotta.
SHEET METAL WORK
Flashing—16 oz. copper. Gutters and leaders—Armco iron, American Rolling Mill Co.
WINDOWS
Sugar pine casement and some steel sash. Weather-stripping—Chamberlain Metal Weatherstrip Co. Glass—single strength, quality A, Lustraglass, American Window Glass Co. Screens—Roll Away Screen Co.
STAIRS
Treads—oak. Risers and stringers—pine.
FLOORS
Living room, bedrooms and halls—oak, Herringbone pattern. Kitchen—linoleum covered pine. Bathrooms—tile.
WALL COVERINGS
Living room—canvas. Bedrooms and halls—wallpaper. Kitchen and bathrooms—Sanitas, painted, Standard Textile Products Co.
WOODWORK
Trim—vertical grain pine. Shelving and cabinets—white pine and cedar. Interior doors—Oregon pine. Exterior doors—sugar pine.
HARDWARE
Interior and exterior—Russwin, Russell & Erwin Manufacturing Co.
PAINTING
Interior: Walls and ceilings—canvas, painted and stippled. Floors—oak, stained, shellac, and wax. Trim—enameled. All paint materials by M. Friedman Paint Co.
ELECTRICAL INSTALLATION
Wiring installation—knob and tube, switches by General Electric Co. Fixtures—Robert's Fixture Co.
PLUMBING
All fixtures by Standard, Pacific Manufacturing Co. Pipes: Soil, waste and vent—cast iron. Water supply: Hot—copper tubing. Cold—galvanized steel.
HEATING AND AIR CONDITIONING
Hot air, gas furnace, blower, filters and automatic humidifier. Hot water heater—gas automatic.

19. HOUSE FOR PRICE BERRIEN, PORT CHESTER, N. Y.



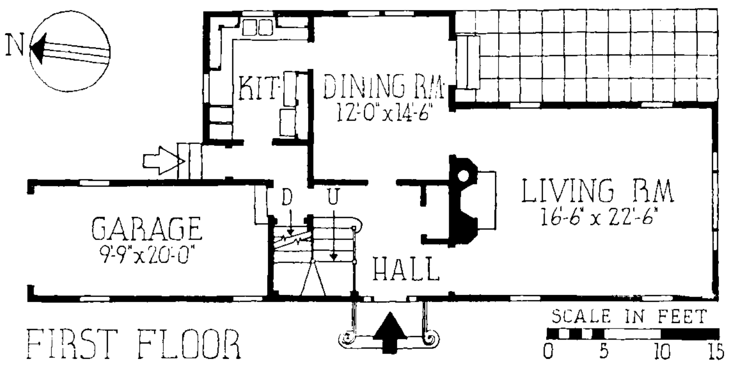
W. W. Hennessy Photos

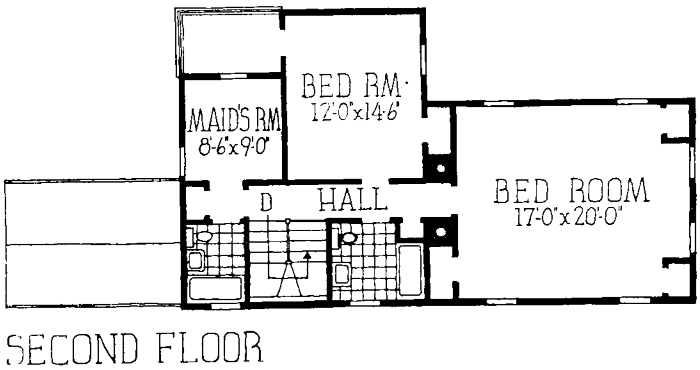
Problem: To provide accommodations for a young couple and a maid. The plot is 200 x 200 and is located on the edge of a large estate. The house to harmonize with the old Colonial house on the estate, and to be as long and low as possible.

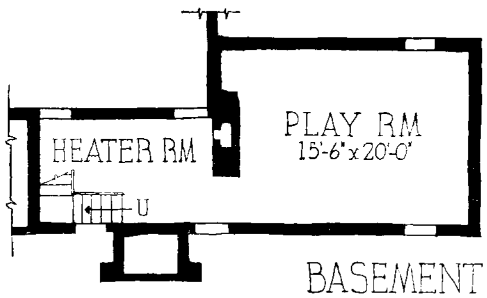
A certain crispness of mass and detail gives this house more character than is usually found in small house adaptations of Colonial.

The architect comments: "The first floor arrangement of spaces gives reasonably long interior vistas, and provides for access from the front hall to the garage, cellar, play room, living room, dining room, and stair to the second floor—all with a minimum of circulation.

"The chimney was located as shown to leave the space under the living room clear of heating apparatus for use as a play room, and to leave the south wall of the living room free of the fireplace for the picture window and its view over the grounds of the estate." Cubage: 26,755. Cost: $10,777.73 at 40 cents a cubic foot.







CONSTRUCTION OUTLINE

STRUCTURE
Exterior walls—red cedar Perfection shingles, 7/8 in. sheathing, insulation, fir studs, metal lath and 3 coat plaster. Floor construction—fir joists; plaster ceilings on first and second floors, cellar and attic unfinished.
ROOF
Fir rafters and shingle lath, covered with wood shingles. Deck construction—wood, covered with canvas.
CHIMNEY
Terra cotta lining. Damper—H. W. Covert Co.
SHEET METAL WORK
Flashing and gutters—copper.
INSULATION
Outside walls and attic floor—4 in. rock wool.
WINDOWS
Double hung, white pine, Andersen Frame Co. Glass—quality A.
FLOORS
Living room, bedrooms and halls—red oak. Kitchen—linoleum covered pine. Bathrooms—rubber tile and linoleum.
WOODWORK
Trim, shelving and cabinets—white pine. Doors—Curtis Companies.
HARDWARE
Interior and exterior—P. & F. Corbin.
PAINTING
Interior: Walls, ceilings, trim and sash—lead and oil. Floors—shellac and wax. Exterior: Walls—Cabot's white, Samuel Cabot, Inc. Roof—Creo-Dipt stain, Creo-Dipt Co., Inc.
BATHROOMS AND KITCHEN EQUIPMENT
Seat—C. F. Church Manufacturing Co. Shower—Speakman Co. All other fixtures—Standard Sanitary Manufacturing Co.
PLUMBING
Pipes: Soil and waste—cast iron. Water supply—brass, Bridgeport Brass Co.
HEATING AND AIR CONDITIONING
Winter air conditioning, filter, humidifier and gas furnace, Fox Furnace Co. Thermostat—Chronotherm—Minneapolis-Honeywell Regulator Co.

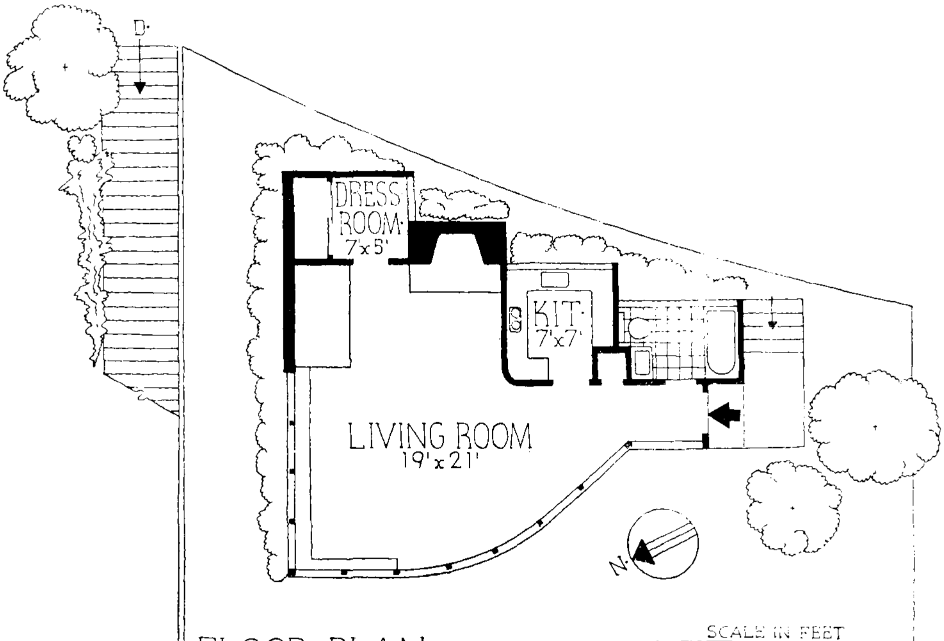
LIVING ROOM

20. GUEST HOUSE FOR DAVID MALCOLMSON, SANTA MONICA, CALIFORNIA

Luckhaus Photos

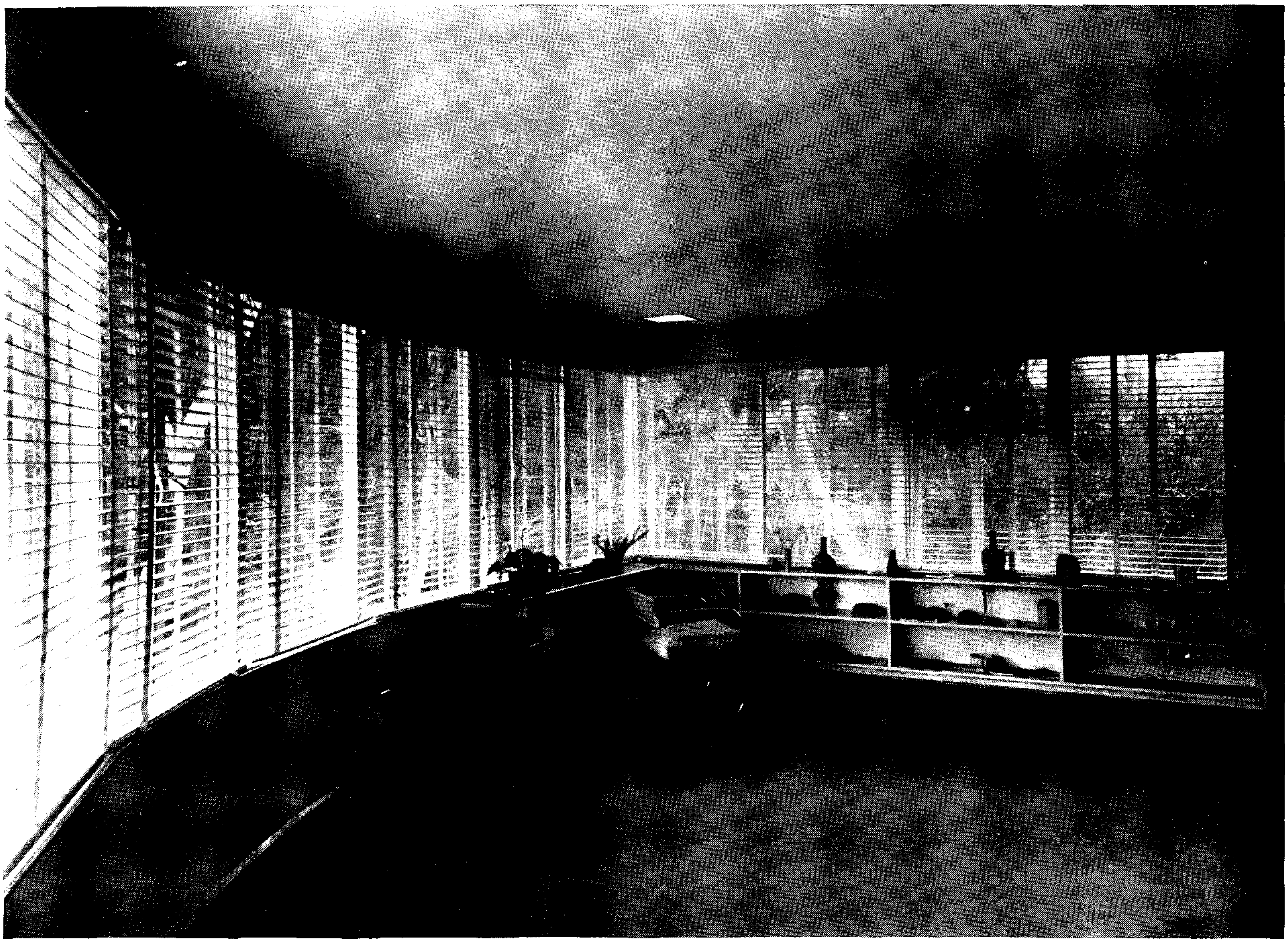
PROBLEM: To put a one-room house on a steep hillside, leaving as much space for garden as possible.

To conserve garden area, a portion of the living room was put on stilts. The room is curved to take advantage of the panorama from west to southwest. A roof deck doubles the living space, and takes even greater advantage of the superb view; for economy a ladder is used for access. Interior walls are covered with a prefinished fabric; the bathroom walls are of blue bakelite with aluminum trim.
Cost: $3,500.

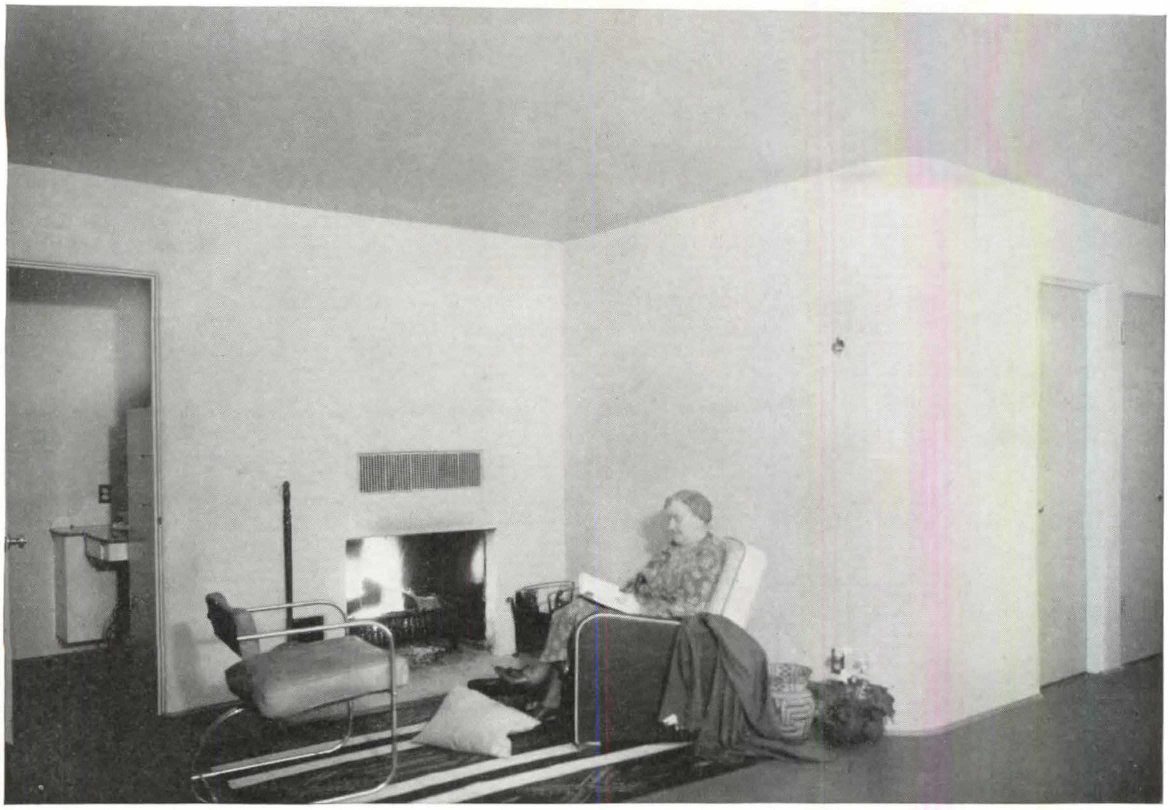


FLOOR PLAN

LIVING ROOM



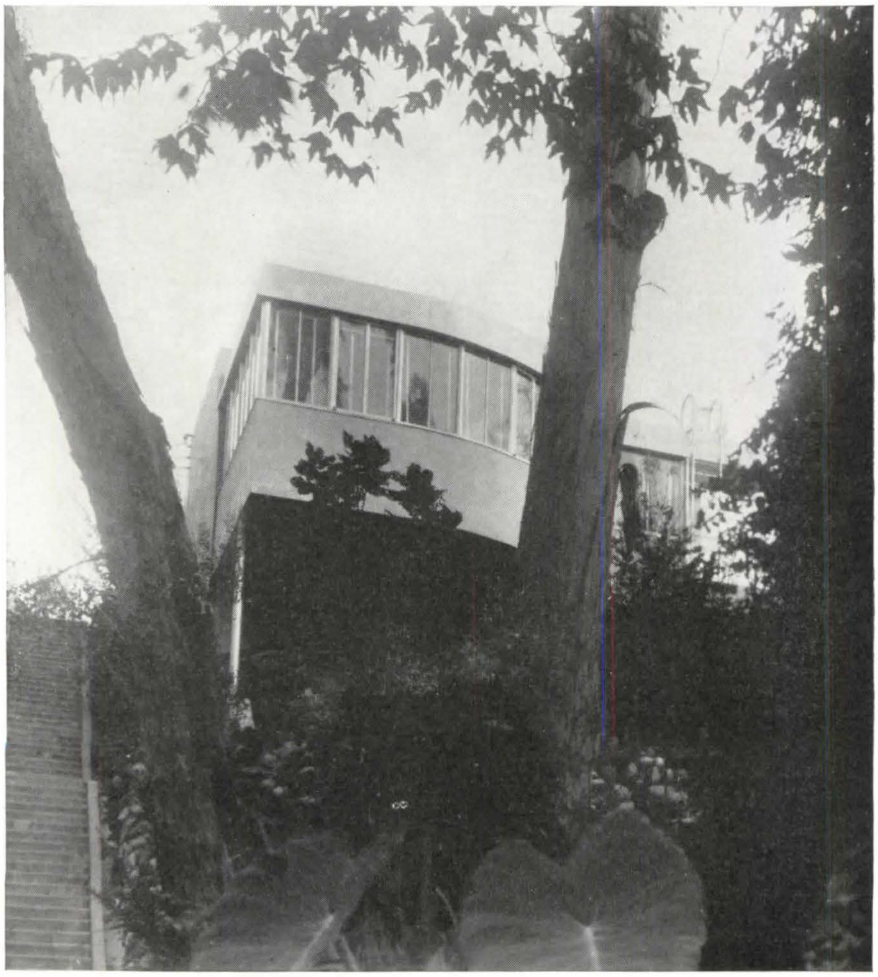
GUEST HOUSE IN SANTA MONICA, CALIF.



LIVING ROOM

Luckhaus Photos

VIEW FROM LOWER GARDEN



CONSTRUCTION OUTLINE

FOUNDATION
Walls—continuous on east side; piers on west side. Waterproofing—plastic cement.

STRUCTURE
Exterior walls—metal lath and cement plaster over galvanized sheet steel on a composite chassis of steel and timber. Interior partitions—sheet rock and hard-wall plaster on wood frame partitions. Floor construction—joists on steel girders.

ROOF
Wood rafters covered with composition roof, Pabco, The Paraffine Companies, Inc. Deck construction—redwood slat grill deck.

CHIMNEY
Lining—terra cotta. Fireplace—circulating air, Heatilator Co.

SHEET METAL WORK
Flashing and gutters—galvanized crimped sheet steel, Armco, American Rolling Mills Co.

INSULATION
Roof—Celotex, The Celotex Co. Weatherstripping—copper.

WINDOWS
Sash—steel, Druwhit Co. Glass—double strength, first A, Libbey-Owens-Ford Glass Co. Screens—copper roller automatic tension screen.

FLOORS
Oregon pine throughout, covered with linoleum, Armstrong Cork Products Co.

WALL COVERINGS
All walls except bathroom—Sanitas, Standard Textile Products Co. Bathrooms—Marlite Bakelite covered Prestboard, Marsh Wall Products Co.

WOODWORK
Trim, shelving and cabinets—Oregon pine. Doors—sugar pine, flush panel, Rezo, The Paine Lumber Co.

PAINTING
Interior: Walls and ceilings—4 coats paint, National Lead Co. Trim and sash—2 coats aluminum Albron, Aluminum Corporation of America. Exterior—waterproof brushcoat.

ELECTRICAL INSTALLATION
Wiring system—standard conduit. Switches—General Electric Co. Fixtures—Holophane Co.

KITCHEN EQUIPMENT
Stove and refrigerator—General Electric Co.

PLUMBING
All fixtures by Crane Co. Pipes: Soil and waste—cast iron. Water supply—wrought iron.

HEATING
Warm air, electric fan heater. Electric hot water heater. Thermador, Thermador Electrical Manufacturing Co.

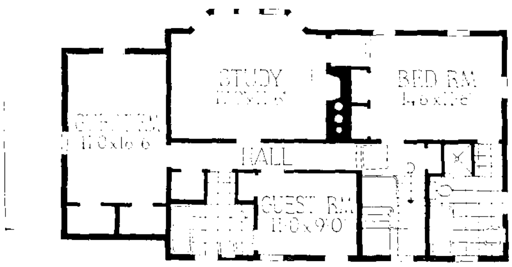
21. RECTORY IN BEDFORD, N. Y.

Harold Haliday Costain

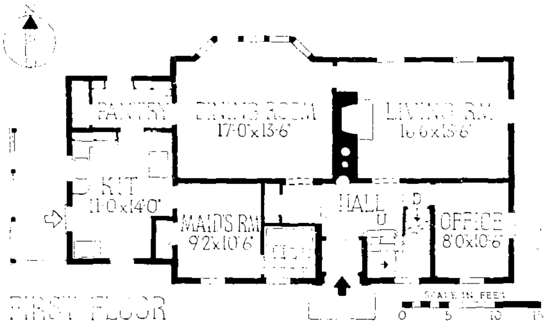
A. MUSGRAVE HYDE AND WILLIAM EDGAR SHEPHERD, ARCHITECTS

PROBLEM: To produce a building to harmonize with the adjoining church and old Colonial buildings nearby, and at the same time function efficiently as quarters and work space for the priest.

The house was set back some distance from the street to produce, with the church, the effect of a close, and also to take advantage of the fine view. The first floor differs from the conventional house only in the private office which has a separate access. Upstairs room has been provided for a bedroom and study, and two guest bedrooms. Cubage: 38,000. Cost: $19,758.49 at approximately 53 cents a cubic foot.



SECOND FLOOR

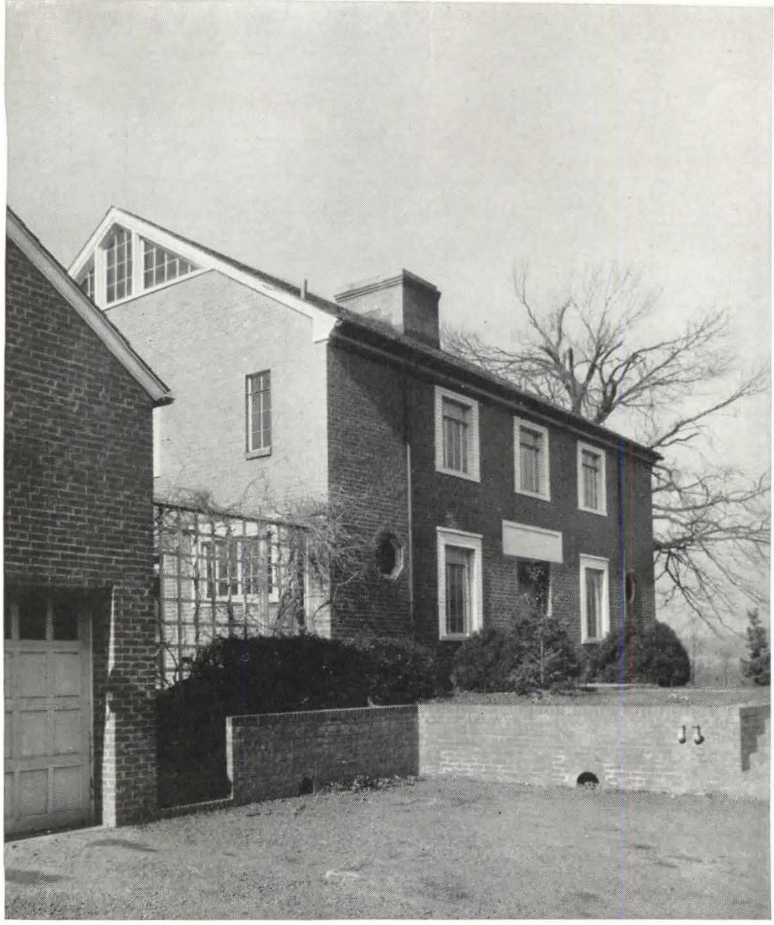


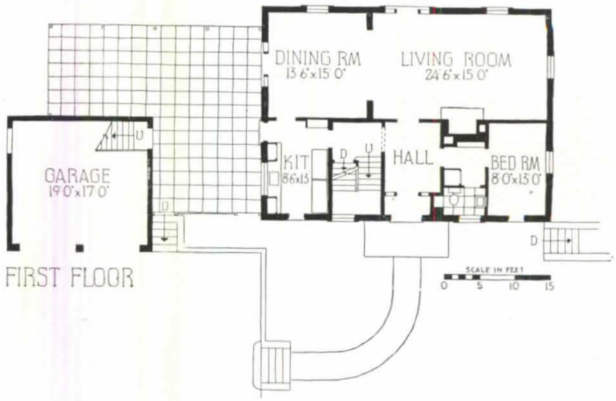
FIRST FLOOR

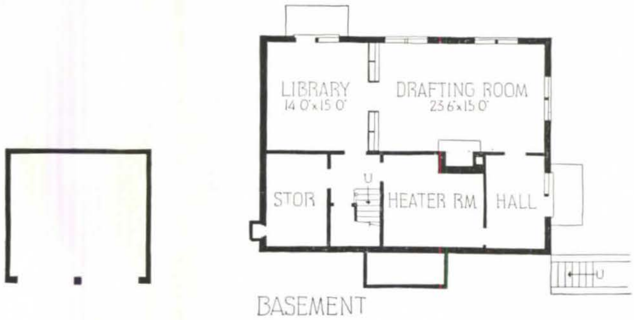
CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—siding on studs, Sisalkraft building paper, The Sisalkraft Co., ⅞ in. diagonal sheathing, 3-coat plaster on Celotex, The Celotex Co.
ROOF: Fir rafters, roof boarding and slate laid over slate asphalt.
SHEET METAL WORK: 16 oz. copper.
INSULATION: Outside walls, ground floor and roof—Celotex, The Celotex Co.
WINDOWS: Sash—double hung, 1⅜ in. wood. Glass—double strength, quality A.
HARDWARE: Colonial type black iron rim locks with brass handles.
PAINTING: Interior: Walls—1 priming coat and 2 coats lead and oil; flat finish. Ceilings—calcimine. Floors—stained and waxed.
ELECTRICAL INSTALLATION: Rigid conduit below first floor; concealed BX flexible cable elsewhere.
KITCHEN EQUIPMENT: Stove—Protane Co. Refrigerator—General Electric Co.
BATHROOM EQUIPMENT: Seat—C. F. Church Manufacturing Co. Shower—Speakman Co. Cabinet—G. M. Ketcham Mfg. Corp. All other fixtures—Standard Sanitary Mfg. Co.
HEATING: Boiler—Richardson & Boynton Co. Oil burner—Petrol No-Kol, Petroleum Heat & Power Co. Registers—Tuttle & Bailey.

22. HOUSE FOR STANISLAW J. MAKIELSKI, UNIVERSITY, VA.







STANISLAW J. MAKIELSKI, ARCHITECT

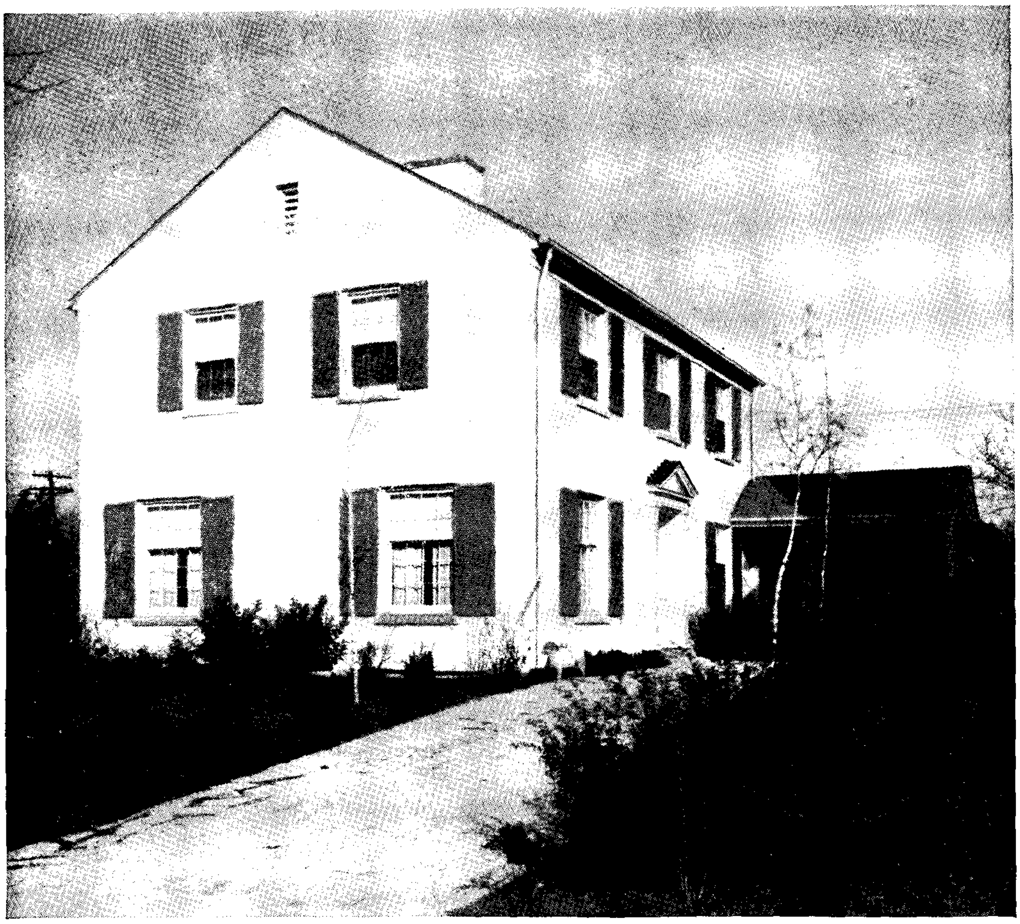
Problem: To provide a residence for a family of five and a workshop for an architect.

The site consists of about two and a half acres, and includes a stream and a small pond. To take advantage of the view the plan was so arranged that living room, dining room, and work room on the first floor, and the main bedrooms on the second, face down the slope to the pond. Requirements of flexibility led to the partial incorporation of the dining room with the living room.
Cubage: 44,450. Cost: $13,000 at 29 cents a cubic foot.

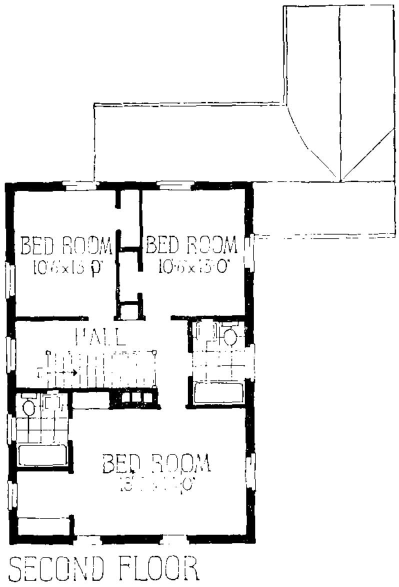
CONSTRUCTION OUTLINE

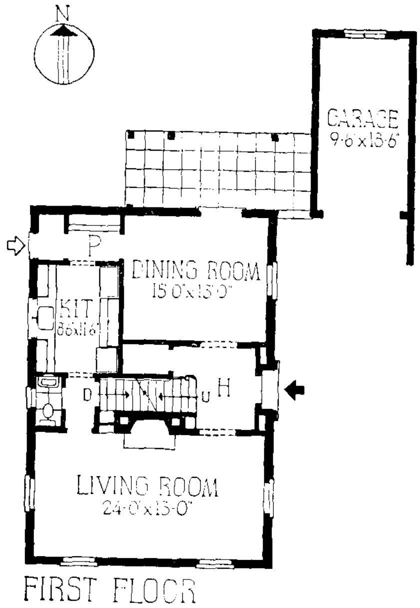
STRUCTURE: Exterior walls—brick, Glasgow Brick Co., cinder block, Richmond Cinder Block Co., and plaster. Interior partitions—frame, white plaster on metal lath. Floor construction—wood joists, sub-floor, yellow pine finish.
ROOF: Wood frame, covered with asbestos shingles, Philip Carey Co.
CHIMNEY: Glazed tile, flue lining. Damper—H. W. Covert Co.
INSULATION: Roof—4 in. mineral wool batts. Weatherstripping—Monarch Metal Weatherstrip Co.
WINDOWS: Steel casement, Crittall Manufacturing Co. Glass—double strength, quality A, Libbey-Owens-Ford Glass Co. Screens—copper mesh, metal frame.
STAIRS: Main treads—oak. Risers and stringers—pine. Attic stair—disappearing type, Bessler Disappearing Stairway Co.
FLOORS: Living room, bedrooms and halls—wood, 1⅛ in. random width. Kitchen and bathrooms — linoleum covered, Armstrong Cork Products Co. Porches—soapstone.
HARDWARE: Solid brass, P. & F. Corbin.
PAINTING: Floors—hot linseed oil and wax. Trim and sash—Alco aluminum, Aluminum Co. of America; paint—Cabot's White, Samuel Cabot, Inc.
ELECTRIC INSTALLATION: Wiring—BX conduit, Benjamin Starrett panel. Switches—Square D. Manufacturing Co. Fixtures—direct, Chase Brass & Copper Co.
KITCHEN EQUIPMENT: Stove—Hot Point, Edison General Electric Appliance Co., Inc. Refrigerator—General Electric Co. Sink—Kohler Manufacturing Co.
BATHROOM EQUIPMENT: Toilet—W. A. Case & Son Manufacturing Co. Shower: Speakman Co. All other fixtures by Kohler Manufacturing Co.
HEATING AND AIR CONDITIONING: Oil fired Timken Rotary, Timken Silent Automatic Co. Regulator—Minneapolis-Honeywell Regulator Co. Boiler—steel, Fox Furnace Co. Air conditioning—filtering and humidifying.

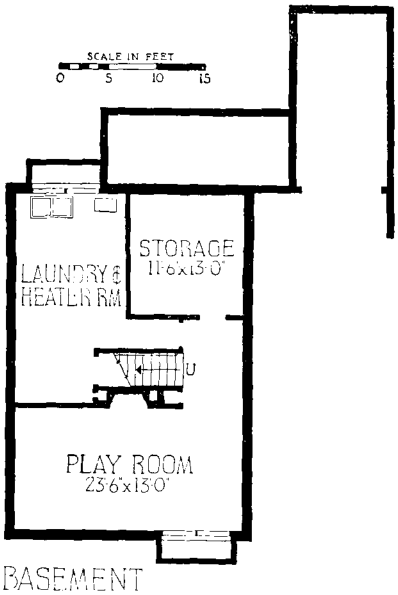
23. HOUSE IN WILMETTE, ILLINOIS



Wesley Bowman







BERESFORD BECK, ARCHITECT

A narrow lot (50 feet) led to the placing of the house with its end facing the street. The arrangement is a reasonable one, although it ensures less privacy for the interior than would be possible with a more conventional plot plan. The plot faces south, thereby giving the house three exposures to the sun; there is a good view to the north. The simplicity of the house is a definite factor in its pleasing appearance.

Cubage: 33,165. Cost: $12,100 at 36 cents a cubic foot.

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—common brick, Neponset waterproof paper, Bird & Son, Inc., yellow pine sheathing, studs, 4 in. rock wool, metal lath and plaster. Floor construction—wood joists, fir sub-floor, stripping, and red oak finish floor. Ceiling—metal lath and plaster.

ROOF: Wood frame covered with asbestos shingles, Philip Carey Co. Deck—frame construction, covered with 20 oz. copper.

SHEET METAL WORK: Flashing—20 oz. copper. Gutters and leaders—Toncan galvanized iron, Republic Steel Corp.

WINDOWS: Double hung, white pine. Glass—Libbey-Owens-Ford Glass Co.

FLOORS: Living rooms, bedrooms and halls—clear red oak. Kitchen and bathrooms—linoleum covered fir, Congoleum-Nairn, Inc.

WALL COVERINGS: Living room and halls—Sanitas, Standard Textile Products Co. Bedrooms—Imperial Paper & Color Corp. Bathrooms—linoleum, Congoleum-Nairn Co.

HARDWARE: Polished brass, Sargent & Co.

ELECTRICAL INSTALLATION: Switches—Harvey Hubbell, Inc. Fixtures—direct, Victor Pearlman Co.

KITCHEN EQUIPMENT: Stove—Geo. D. Roper Corp. Refrigerator—Electrolux, Servel, Inc. Sinks—Standard Sanitary Manufacturing Co.

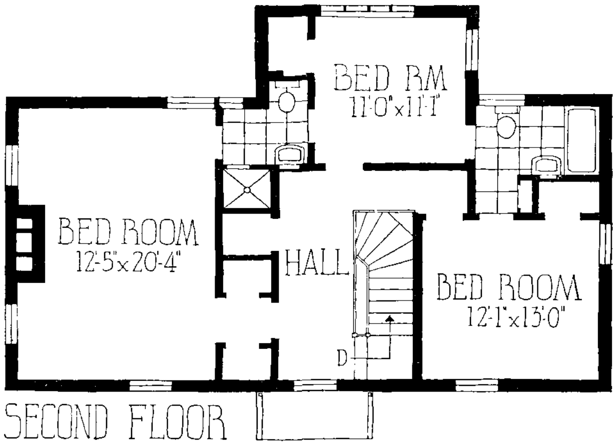
BATHROOM EQUIPMENT: Lavatory, tub and toilet—Standard Sanitary Manufacturing Co. Seat—C. F. Church Manufacturing Co. Shower and all fittings—Chicago Faucet Co. Cabinet—Excel Metal Cabinet Co.

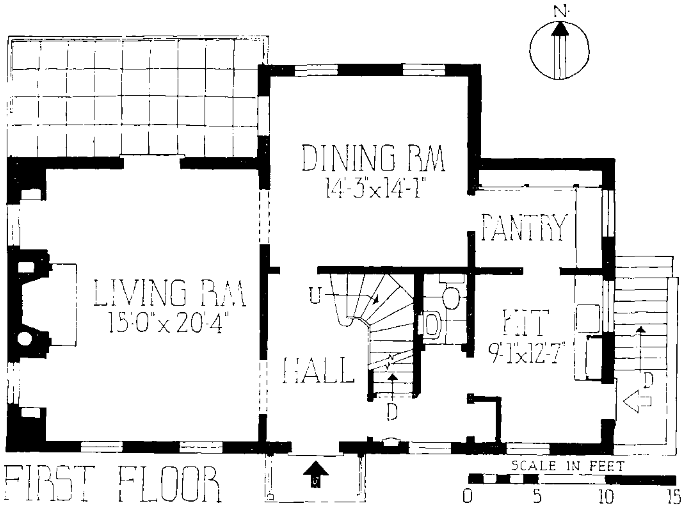
HEATING AND AIR CONDITIONING: Warm air, filtered, humidified, gas furnace, L. J. Mueller Furnace Co. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—Ruud DeSoto, 30 gallon, Ruud Mfg. Co.

24. HOUSE FOR PHIL JONES, KNOXVILLE, TENN.

PROBLEM: To design a small house for a lot 125 feet wide by 140 feet deep which slopes downward from the street.

Since there were large trees on the lot which the owner did not wish to destroy, it was necessary to set the house back, and consequently below the street level. As the slope continues downward it was possible to put the garage and maid's room in the basement, which is above ground. The plan requirements, according to the architects, were not unusual, except that the requirements for circulation from the front hall were rather difficult to meet. The placing of the living room fireplace between deeply recessed windows is not common, and may at times hamper suitable location of furniture. The white brick exterior is typical of much local domestic work.
Cubage: 29,000. Cost $11,500 at 40 cents a cubic foot.





CONSTRUCTION OUTLINE

FOUNDATION
Walls—brick, continuous. Waterproofing—waterproof cement.

STRUCTURE
Exterior walls—brick veneer, building paper, sheathing, studs, insulation, lath and plaster, U. S. Gypsum Co. Floor construction—wood joist, sub-floor, and oak finish floor. Ceiling—lath and plaster, U. S. Gypsum Co.

ROOF
Rafters and sheathing, covered with slate.

CHIMNEY
Brick with Majestic Manufacturing Co.'s damper.

SHEET METAL WORK
Flashing and gutters—copper.

INSULATION
Outside walls and attic floor—4 in. mineral wool. Weatherstripping on exterior doors—Monarch Metal Weatherstrip Corp.

WINDOWS
Double hung, pine. Glass—double strength, quality A. Screens—copper mesh on wood frames.

STAIRS
Treads—oak. Risers and stringers—pine.

FLOORS
Main rooms—oak. Kitchen—linoleum, Armstrong Cork Products Co. Bathrooms—tile.

WALL COVERINGS
Bedrooms—wallpaper.

WOODWORK
Pine throughout.

HARDWARE
Interior and Exterior—Russell & Erwin Mfg. Co.

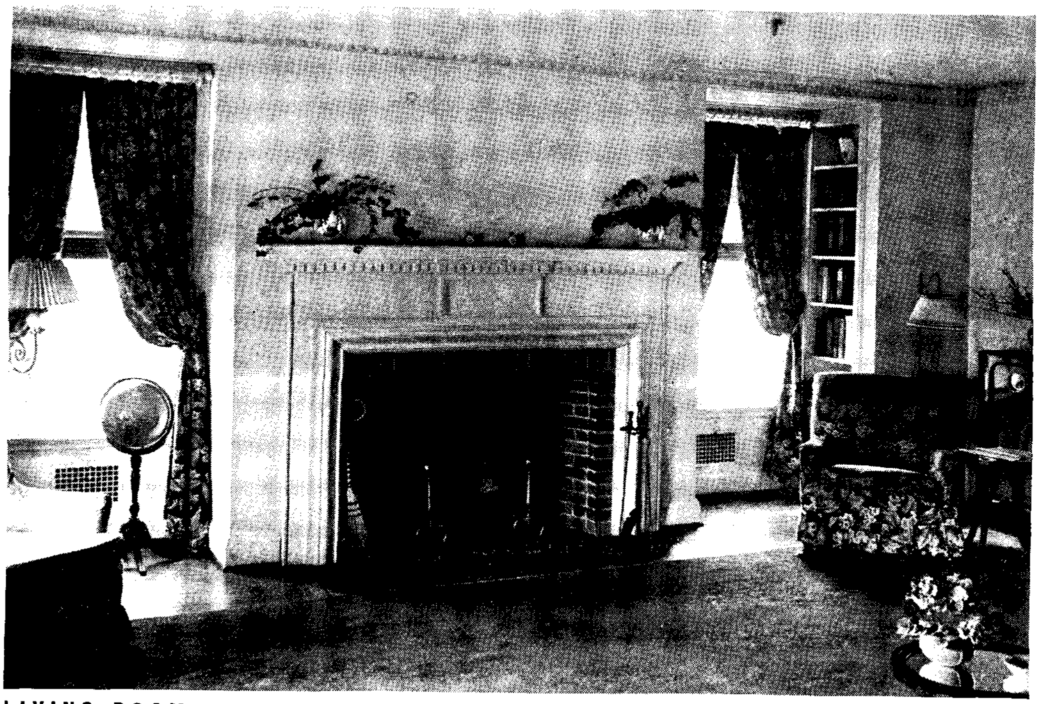
PAINTING
All paint material by Berry Brothers. Exterior walls—Bondex, The Reardon Co.

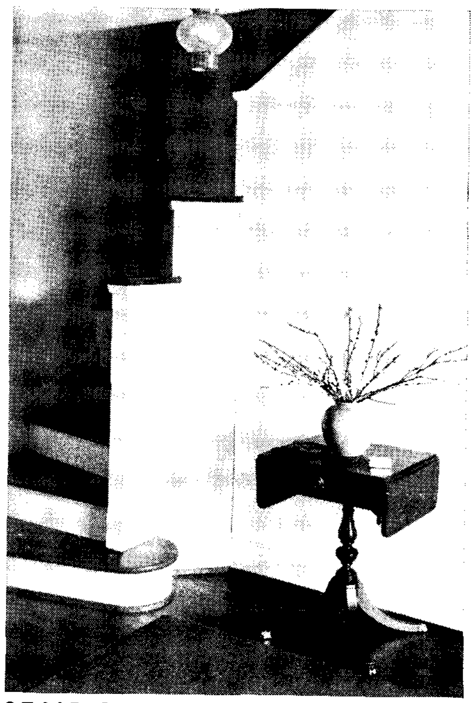
ELECTRICAL INSTALLATION
Wiring system—BX cable.

KITCHEN EQUIPMENT
Stove and refrigerator—electric.

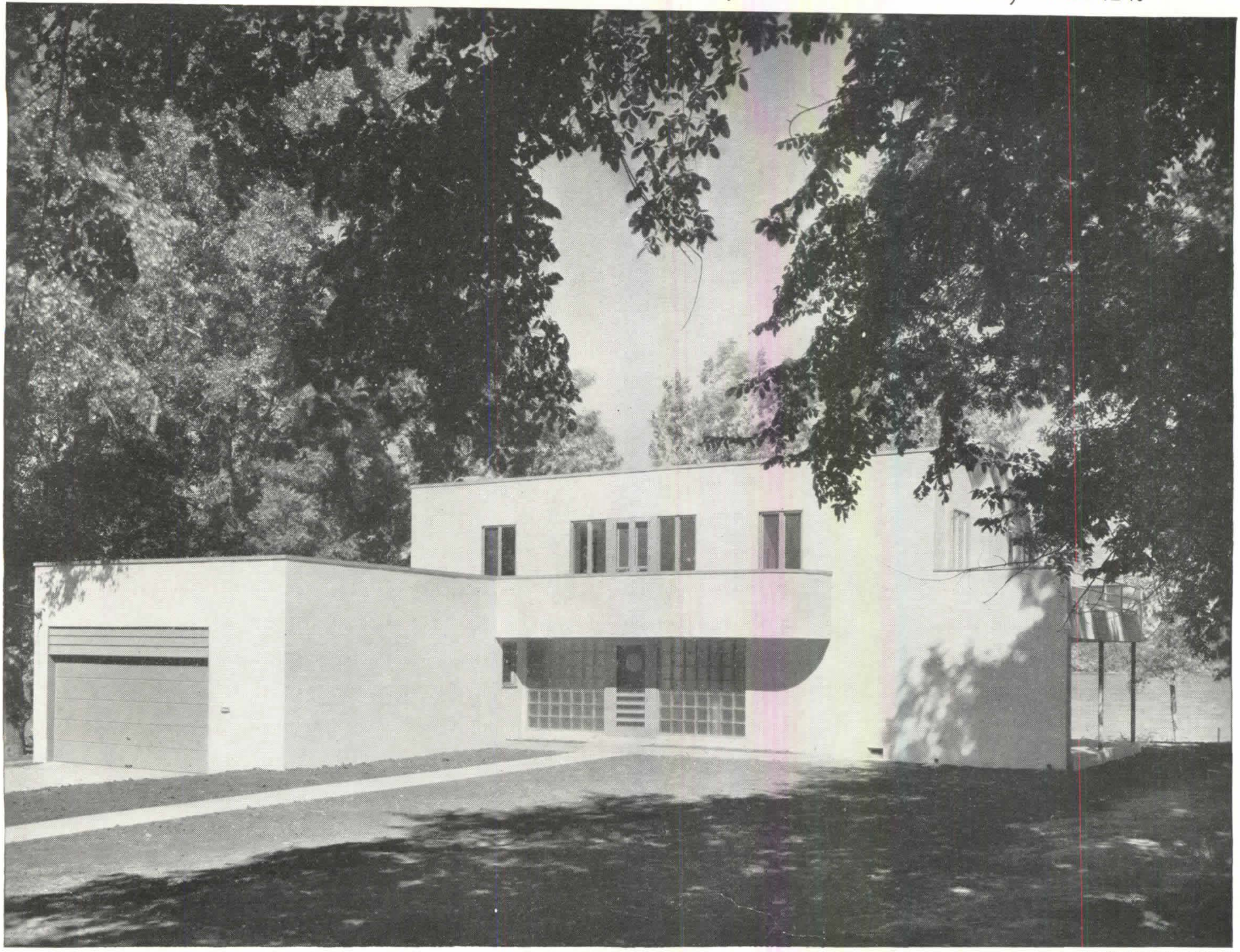
PLUMBING
All fixtures by Crane Co. Pipes: Soil and waste—cast iron. Water supply—wrought iron.

HEATING AND AIR CONDITIONING
Sunbeam unit, filtering and humidifying, Fox Furnace Co.


LIVING ROOM


STAIR DETAIL

25. HOUSE FOR V. M. S. KAUFMANN, MINNEAPOLIS, MINN.



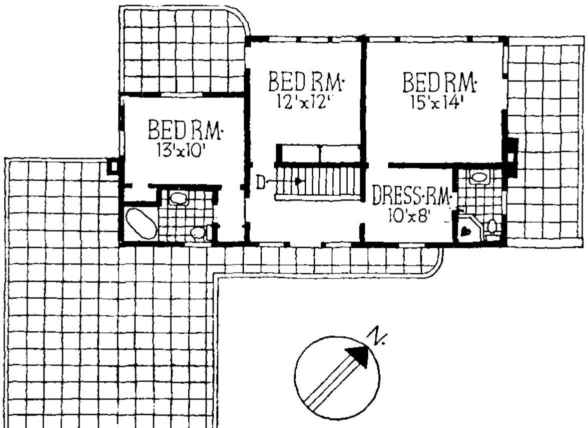
Charles W. Howson Photos

PROBLEM: To design a house for use chiefly on week-ends, by a couple with no children. The owner wanted an open, informal plan with ample facilities for entertaining.

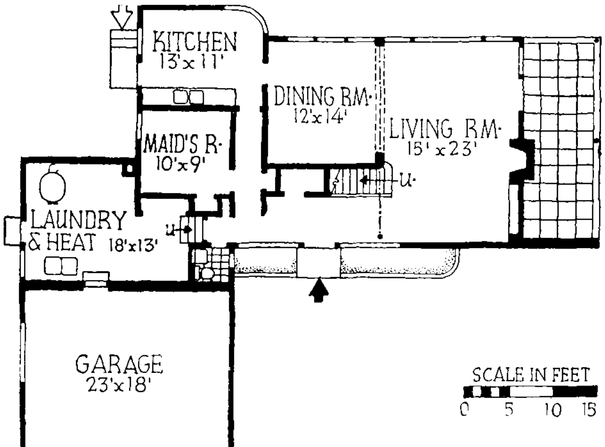
The large windows open the entire lake side to the view. In a correspondingly generous manner the rooms open into one another, solving the requirements of informality and of facilities for entertaining. The garage, incorporated with the house, adds interest to the mass, and the balcony above serves as a shelter over the door.

The architects comment: "The house was originally designed for reenforced concrete beam and slab construction, but due to the inexperience of the average small house contractor in this section, and to the higher cost, it was changed to wood. Site conditions indicated that a basement should be omitted and this spring has proven that it was wise to do so. The maid, whose bathroom lacks bathing facilities, uses the shower in the laundry."

Cost: $12,000.



SECOND FLOOR



FIRST FLOOR

CONSTRUCTION OUTLINE

STRUCTURE
Exterior walls—stucco, Johns-Manville, Inc., wire lath, No. 2 fir shiplap, 2 x 4 in. studs, ½ in. Insulite, Insulite Co., lime plaster, U.S. Gypsum Co. Floor construction—fir, 2 x 10 in. joists, rough boards select red oak.

ROOF
Construction—wood joists and blocking for pitch, covered with 20-year bonded roofing with Mica cap sheet, The Barrett Co. Decks covered with 1 x 3 in. wood grill.

CHIMNEY
Lining—glazed tile. Fireplace—tri-stop damper, Peerless Manufacturing Corp.

INSULATION
Outside walls, ground floor and roof—4 in. rock wool, Johns-Manville, Inc.; ½ in. Insulite plaster base; 1 in. Insulite under-roofing, Insulite Co.

WINDOWS
Sash—wood casements, weatherstripped and screened, crank and lever operated, Andersen Frame Corp.

WALL COVERINGS
Living room, bedrooms and halls—wallpaper. Kitchen—Carrara glass above counters—Pittsburgh Plate Glass Co. Bathrooms—Carrara glass and paper.

WOODWORK
Trim, cabinets and doors—birch. Exterior doors—pine. Garage doors—single, overhead type, Frantz Manufacturing Co.

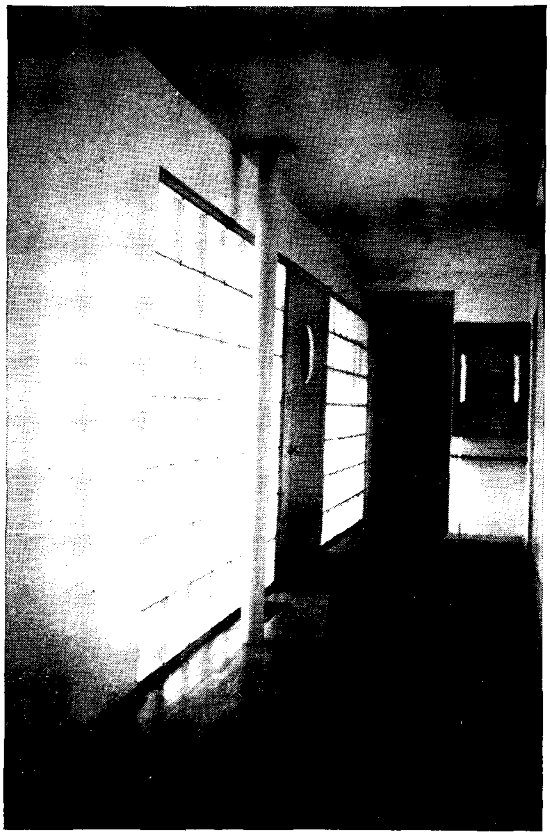
HARDWARE
Interior and exterior—Schlage Lock Co.

ELECTRICAL INSTALLATION
Wiring system—BX cable. Switches—Bryant Electric Co. Fixtures—concealed built-in, direct and indirect.

KITCHEN EQUIPMENT
All equipment by General Electric Co. Cabinets—wood.

BATHROOM EQUIPMENT
All fixtures by Standard Sanitary Manufacturing Co. Seat—C. F. Church Mfg. Co. Cabinet—Lawco, F. H. Lawson Co.

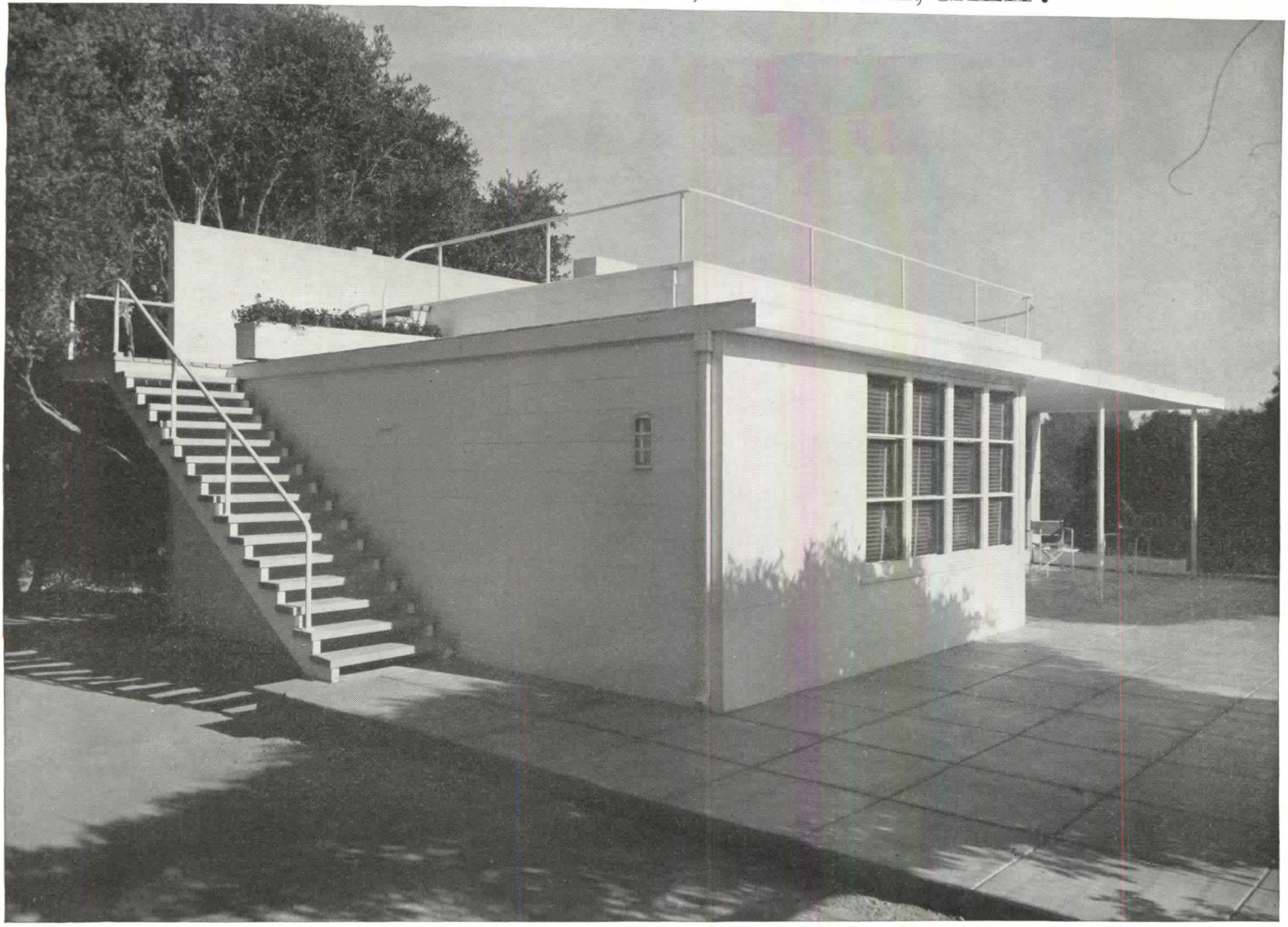
HEATING AND AIR CONDITIONING
Air conditioning system including filtering and humidifying, General Electric Co. Thermostat—Minneapolis-Honeywell Regulator Co. Hot water heater, General Electric Co.



ENTRANCE HALL

REAR ELEVATION

26. HOUSE FOR WILLIAM LOWE JR., WOODSIDE, CALIF.

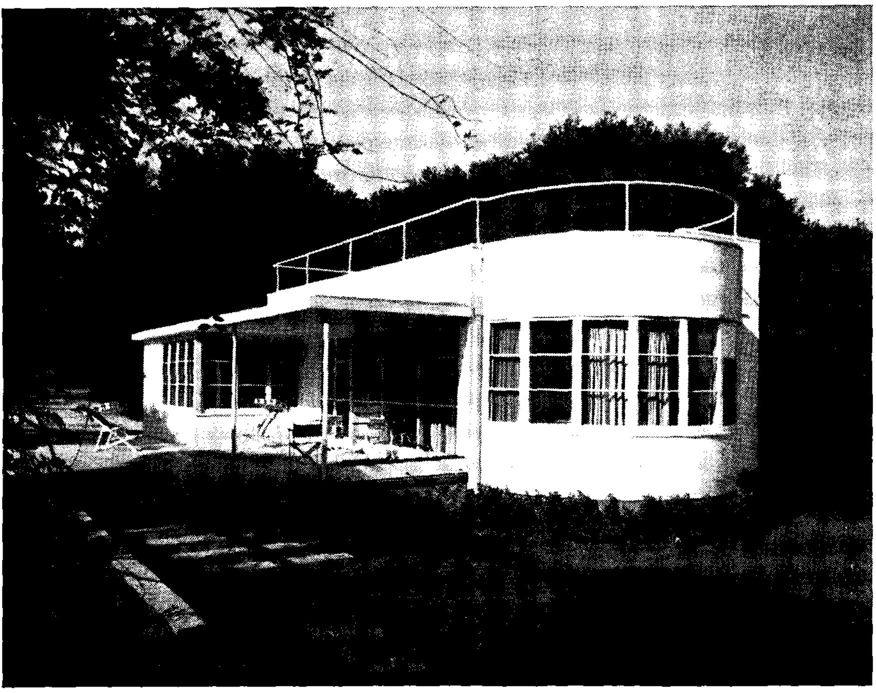


This soundly designed and attractive week-end house was built on a large country estate for the use of the owner's son.

The architect comments: "For the country estate a week-end house serves a three-fold purpose: it takes care of the week-end guest, it can be used in the winter by the owner without the trouble of opening the large house, and if placed near a tennis court or swimming pool it serves as a recreation center and provides dressing facilities.

"The living room can be used for living, sleeping, and dining. The built-in sofas are comfortable beds. The sliding doors to the kitchen can be opened for buffet style meals or for drinks, and can be closed when more elaborate meals are prepared. To reduce housekeeping to a minimum almost all furniture is built-in, and floors are linoleum-covered. Complete insulation has greatly added to comfort the year around, and has made it possible to heat the house with one small floor furnace."

Cubage: 10,728. Cost: $4,800 (exclusive of architect's fee) at about 45 cents a cubic foot.



NOTE: "A new method was employed in the installation of insulation board for walls and ceiling to eliminate the usual cracks and unevenness when battens are omitted.
Studs were set 2'-0" on centers. To the studs and joists were nailed 4 in. width of ¼ in. tempered hardboard to come exactly where the sheets of insulation board joined. These strips were then buttered with linoleum cement and the wall board was butt-jointed and held in place by temporary nailed wood strips. Twelve hours later, when the cement had set the temporary presses were removed, leaving the walls perfectly flush with no sign of a joint, and leaving the wall boarding monolithic with no possibility of separating.
For protection the walls were then covered with sheeting to receive the paint finish.
This work actually cost less than a first-class job of plastering, and the walls were mechanically straighter and truer than the average plaster wall, and it was done in three weeks' less time than would have been taken by ordinary plastering."

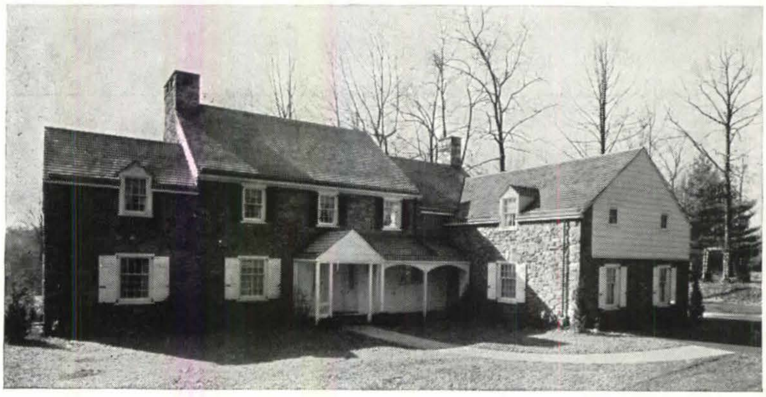
VING ROOM

CONSTRUCTION OUTLINE

FOUNDATION
Walls—reenforced concrete, continuous.
STRUCTURE
Exterior walls—redwood flush boarding, building paper, Pabcotite by The Paraffine Companies, Inc., diagonal braced sheathing on Douglas spruce framing, ¼ in. tempered Hardboard, ¾ in. Graylite insulation board, The Insulite Co. Floor construction—Douglas spruce joist covered with diagonal sub-floor covered by ¼ in. semi-hard hardboard, The Insulite Co.
ROOF
Same as floor construction above covered with Pabco Floatine asphalt composition roofing, 30 lb. felt, mineral surfaced composition sheets, The Paraffine Companies, Inc.
CHIMNEY
Common brick, lined with terra cotta.
SHEET METAL WORK
Flashing and gutters—galvanized iron.
INSULATION
Roof—¼ in. semi-hard Hardboard nailed to joist, The Insulite Co. Space below roof—asbestos quilt insulating felt, Pak-Felt, The Paraffine Companies, Inc.
WINDOWS
Sash—casement, sugar pine. Frame—Douglas spruce. Glass—double strength, quality A, Libbey-Owens-Ford Glass Co. Living room bay window—3/16 in. crystal sheet. Screens—copper on wood frames. Venetian blinds—Rolscreen Co.
FLOORS
All floors—¼ in. semi-hard hardboard, The Insulite Co., covered with linoleum.
WALL COVERINGS
In all rooms—sheeting over insulation board and painted.
WOODWORK
Trim, shelving and cabinets—Douglas spruce. Interior doors—¼ in. tempered Hardboard, The Insulite Co., glued to two sides of a Douglas spruce frame made of 1 x 4 in. material.
HARDWARE
Interior and exterior—Sargent and Co. Sliding door—Pitcher Door Co.
PAINTING
All paints and finishes by Paraffine Companies, Inc.
ELECTRICAL INSTALLATION
Wiring system—knob and tube.
BATHROOM EQUIPMENT
All fixtures by Standard Sanitary Manufacturing Co. Shower floor—cast rubber, Rubberceptor, Inc.
PLUMBING
Pipes: Cold water—galvanized wrought iron. Hot water—copper tubing.
HEATING
Gas floor furnace. Hot water heater—gas, storage type, Pittsburgh Water Heater Co.

27. HOUSE FOR SUMNER B. EMERSON, ST. DAVIDS, PA.

Photos, Philip B. Wallace



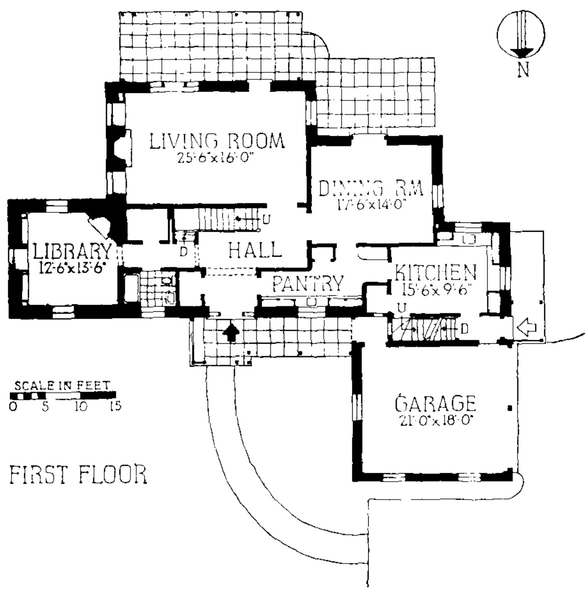
An informal house, planned to make the best use of an ample site.

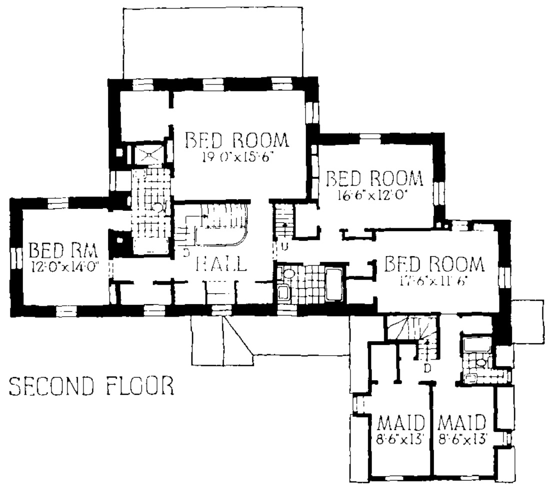
The architect comments: "The lot—about one and a quarter acres—is on a corner and has 227 feet frontage on a main road. There is a decided slope to the south, ending in a small stream and a grove of trees. We decided to run all main rooms, porch, and terrace on the south side, giving them the best exposure, and protection from the road. We did not hesitate, therefore, to place the house closer to the road than would ordinarily be the case on a lot of this size.

"The owner wished to have a covered passage from the garage to the front door, which led to the arcade on the front. The entrance hall is tiled for practical reasons, and there is direct access to it from the pantry for service. This has been very satisfactory from the owners' point of view.

"The library was designed so that it might be converted into a guest room, which explains the tub in the lavatory. There is a large closet in the passage, which can be closed off by a sliding door. A chest of drawers has been built into the closet. An additional advantage of the arrangement is that the room may be used as an isolation ward in case of sickness."

Cost: 39 cents a cubic foot.





CONSTRUCTION OUTLINE

STRUCTURE
Exterior walls—18 in. stone, 2 x 3 in. stripping, 2 in. rock wool, rock lath, U.S. Gypsum Co., and plaster. Interior partitions—wood studs and hard wall plaster. Floor construction—wood joists, ⅞ in. sub-floor, ⅞ in. finish floor. Ceilings—plaster.

ROOF
Covered with wood shingles.

CHIMNEY
Stone with terra cotta flue lining. Damper—H. W. Covert Co.

SHEET METAL WORK
Flashing, gutters and leaders—copper.

INSULATION
Outside walls—2 in. rock wool. Attic floor and over garage ceiling—4 in. rock wool. Weatherstripping—Chamberlin Metal Weatherstrip Co.

WINDOWS
Sash—white pine, double hung and casement. Glass—double strength, Libbey-Owens-Ford Glass Co.

STAIRS
Treads—oak. Risers—white pine. Stringers—spruce.

FLOORS
Living room—random width oak. Bedrooms—2 in. face white oak, ⅞ in. thick. Kitchen and bathrooms—linoleum covered pine.

WALL COVERINGS
All rooms—wallpaper. Bathrooms—Sanitas, Standard Textile Products Co.

WOODWORK
Trim and exterior doors—special white pine. Interior doors—6-panel Colonial, Morgan Sash & Door Co. Shelving and cabinets—special. Garage doors—overhead type, J. G. Wilson Co.

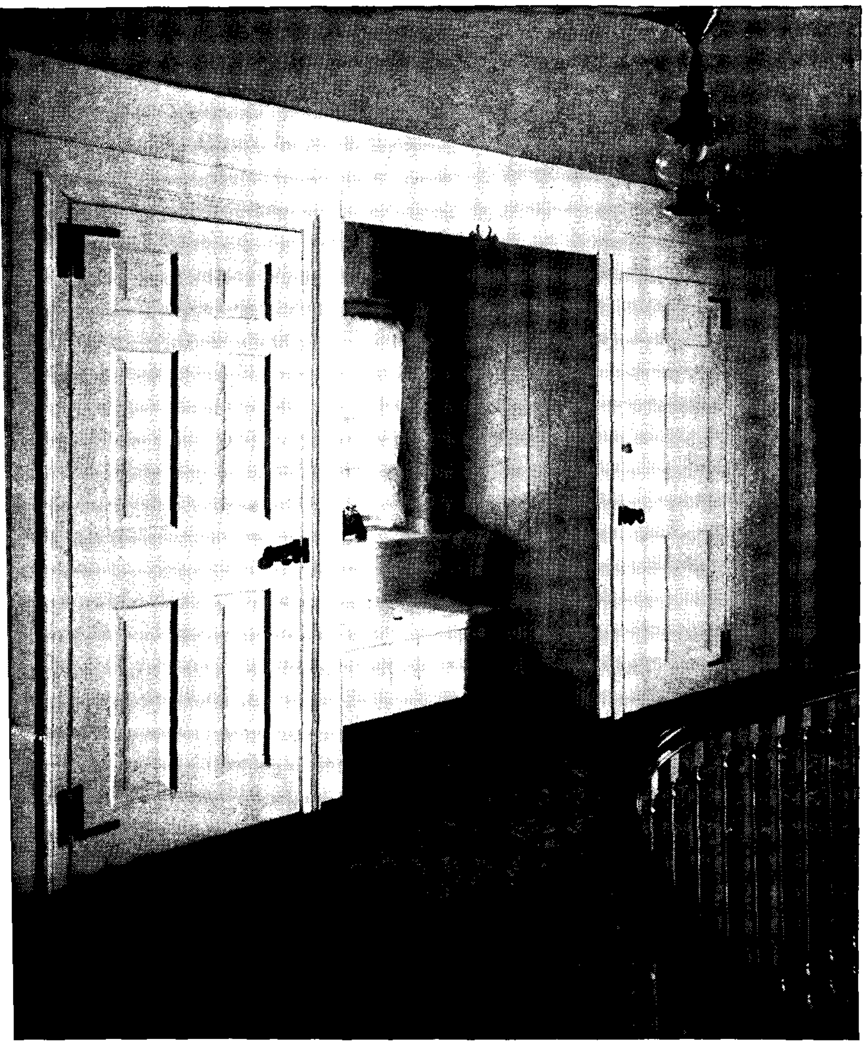
HARDWARE
Interior and exterior—some special hand forged, remainder by Schlage Lock Co.

PAINTING
Floors—stained and waxed. Exterior trim and sash—paint.

KITCHEN EQUIPMENT
Stove—gas. Refrigerator—General Electric Co. Sink—Kohler Co.

PLUMBING
All fixtures by Kohler Co.

HEATING AND AIR CONDITIONING
Oil burner. Air conditioning system and thermostat control—Gar Wood Industries, Inc. Hot water heater—electric.

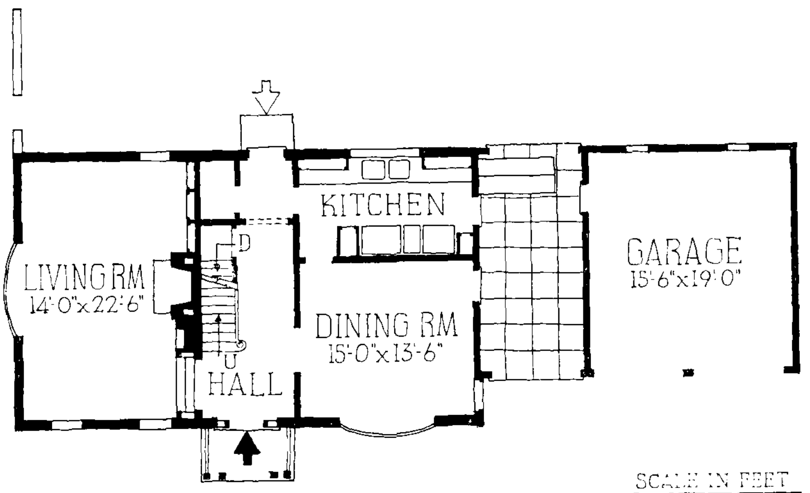


ALL-SECOND FLOOR

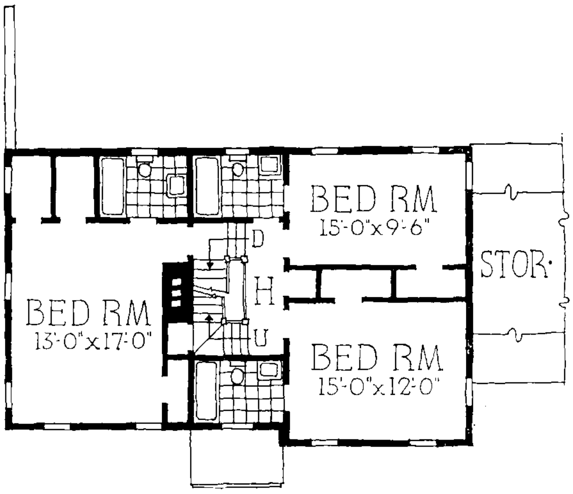
28. HOUSE FOR GRACE & H. B. ATKIN, PORT WASHINGTON, L. I., N. Y.

Adolph Studly, Jr. Photos

The familiar plan with living room balanced by dining room and kitchen is varied here only in the unusual arrangement of floor levels, suggested by the slope of the plot. The master bedroom is on a slightly lower level than the other bedrooms, and on the first floor the living room is correspondingly set down. This arrangement is reflected in the exterior by a gable, set out slightly from the rest of the elevation. The architect states that it could be built today for about 39 or 40 cents a cubic foot.



FIRST FLOOR



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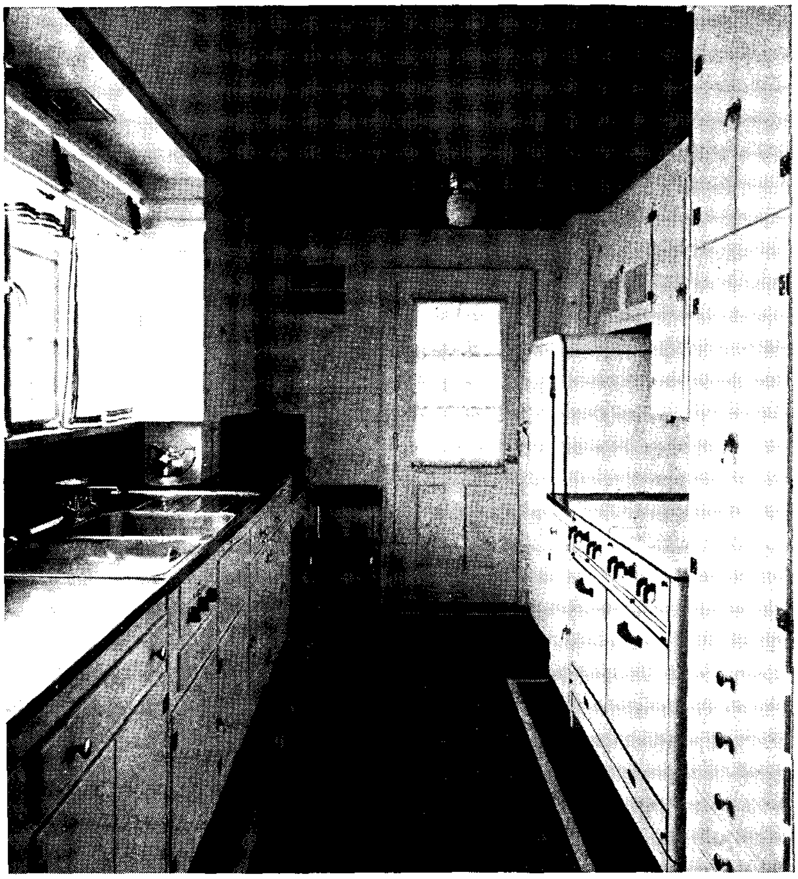


CONSTRUCTION OUTLINE

FOUNDATION
Walls—poured concrete, continuous. Waterproofing—integral.

STRUCTURE
Exterior walls—siding and brick veneer, hard finish white plaster on metallated Ecod lath, Reynolds Corp. Floor construction—wood joists, double wood floors. Ceilings—metal lath and hard finish plaster.

ROOF
Wood shingles over shingle lath.

CHIMNEY
Lining—terra cotta. Damper—H. W. Covert Co.

SHEET METAL WORK
Flashing and leaders—Copper. Gutters—wood.

INSULATION
Outside walls, third floor ceiling and roof—4 in. rock wool. Weatherstripping—zinc.

WINDOWS
Sash—wood, double hung and steel casements. Glass—quality A, Libbey-Owens-Ford Glass Co.

STAIRS
Treads—oak. Risers and stringers—birch.

FLOORS
Main rooms—white oak. Kitchen—linoleum covered pine. Bathrooms—pine covered with sheet rubber.

WALL COVERINGS
Main rooms—wallpaper. Bathrooms—tile and wallpaper.

WOODWORK
Interior doors—6-panel white pine veneer. Exterior doors—solid white pine.

HARDWARE
Interior and exterior—P. & F. Corbin. Garage door—Stanley hinges and shutter hardware, Stanley Works.

PAINTING
Interior: Ceilings—cold water paint. Floors—stained and waxed. Trim and sash—enameled. Exterior: Walls—3 coats, lead, oil and zinc on wood, whitewash on brick. Roof—creosote stain.

ELECTRICAL INSTALLATION
Wiring system—BX. Switches—toggle. Fixtures—indirect in kitchen and bathrooms, direct elsewhere.

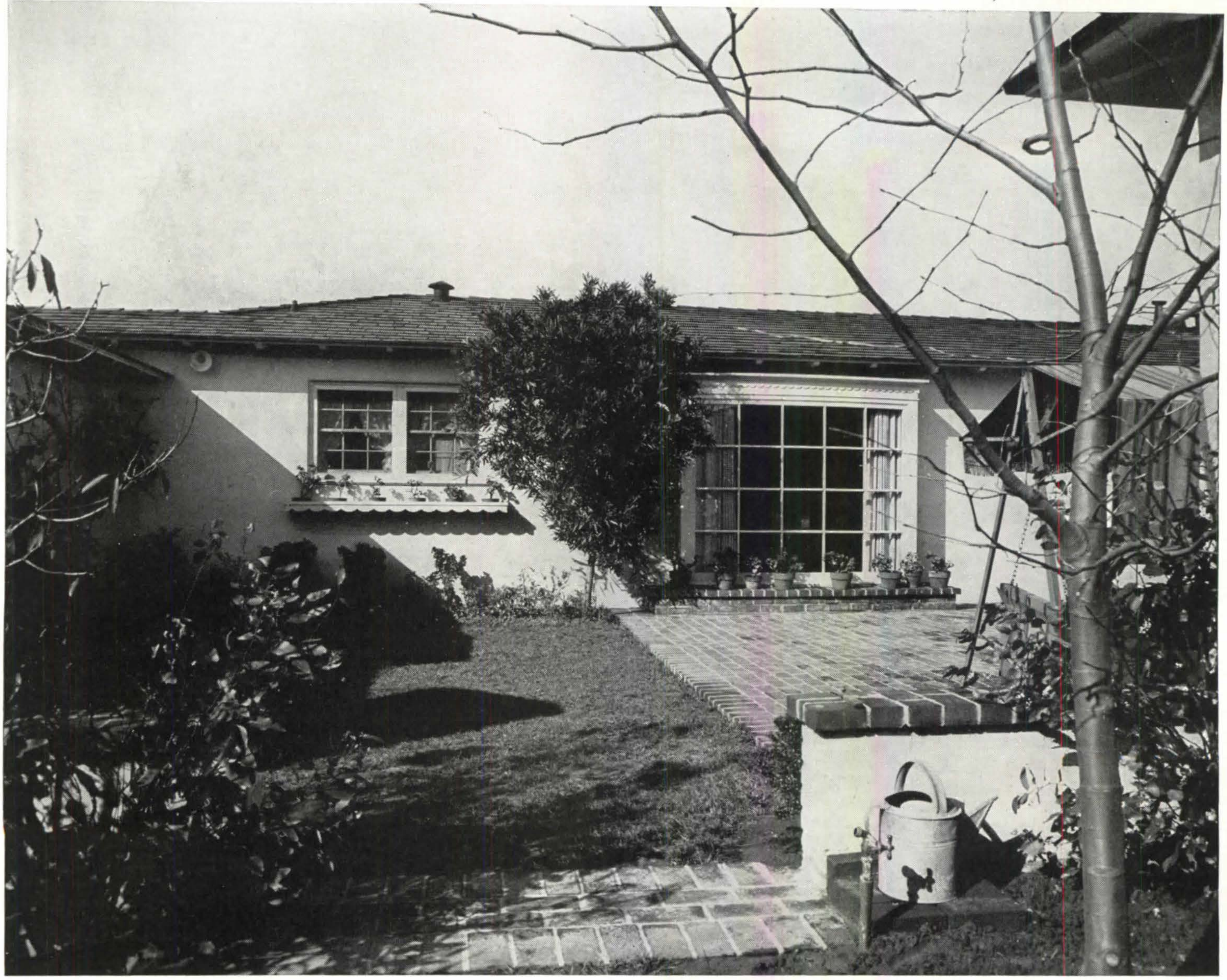
KITCHEN EQUIPMENT
Refrigerator—Electrolux, Servel, Inc. Sink and Dishwasher—General Electric Co.

BATHROOM EQUIPMENT
Seat—C. F. Church Manufacturing Co. All other fixtures—Standard Sanitary Manufacturing Co.

PLUMBING
Pipes: Soil—extra heavy cast iron. Waste—wrought iron. Vent—steel.

HEATING AND AIR CONDITIONING
Boiler—gas fired, Bryant Heater Co., humidification, filtration and circulation. Regulator—Minneapolis-Honeywell Regulator Co.

29. HOUSE FOR CLARE D. HAMMAN, LONG BEACH, CALIF.



Floyd Ray

PROBLEM: To relate as many rooms as possible to the patio. (The patio is used about eight months of the year as an outdoor dining room.)

Typical in its general appearance, this house shows an unusually good relation of rooms to each other and to the patio. A pleasant feature of the exterior is the large dining room bay, set on a broad brick base wide enough to accommodate plants and flowers.

The architect's comments, and replies to questions:

"The maid's room is in an unusual position, but the owner wanted her room as near as possible to the children's without having it actually adjoining the family bedrooms."

Q. Is not the inclusion of a breakfast room in a small house that has a dining room a wasteful use of space?

A. "The alcove is used by the family at breakfast and as a servant's dining room the rest of the day. It may be wasteful, but most families prefer an alcove for occasions when they do not wish to prepare the dining room."

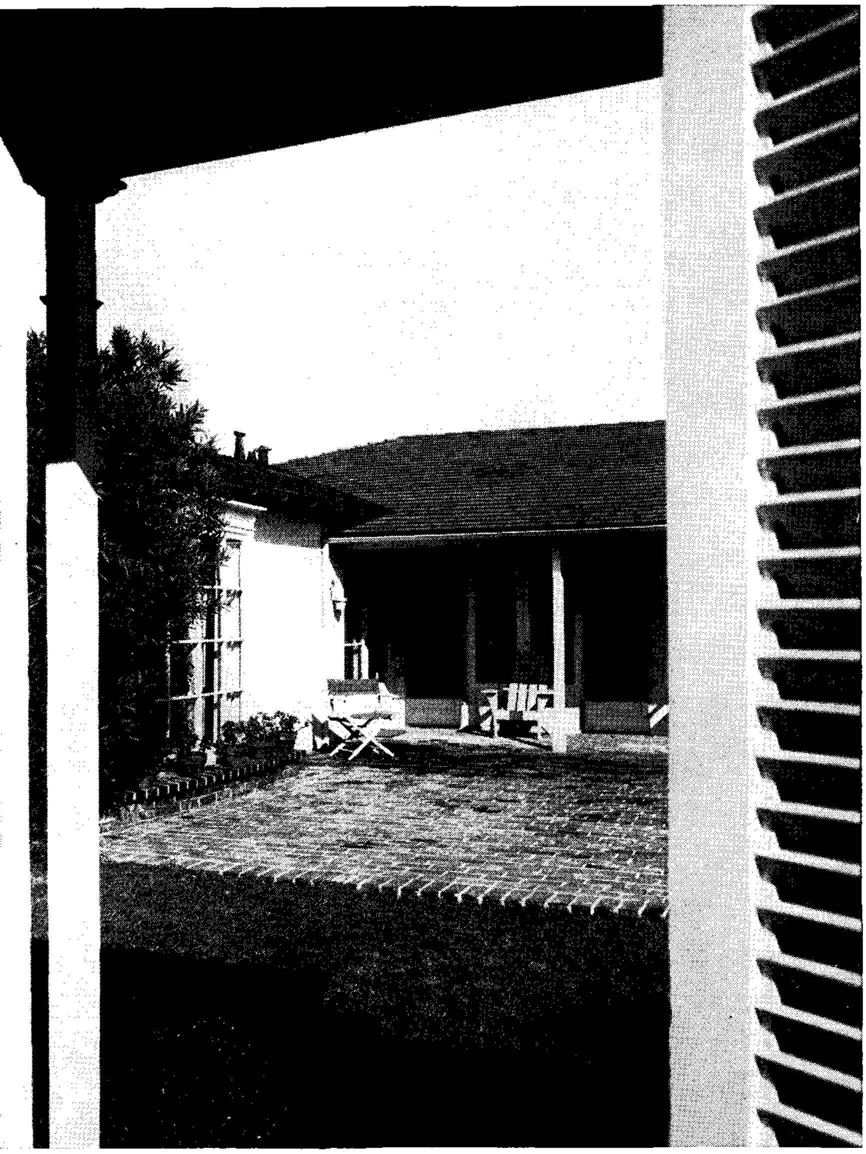
Q. Why are 2 x 6 studs used for partitions instead of 2 x 4's?

A. "The 2 x 6 stud walls were used so that the French door hardware would not interfere with that of the screen doors. Roll screens also work better in thicker walls."

Q. The shallow closets with sliding doors seem excellent. How do the sliding doors compare with hinged doors for cost and practicality?

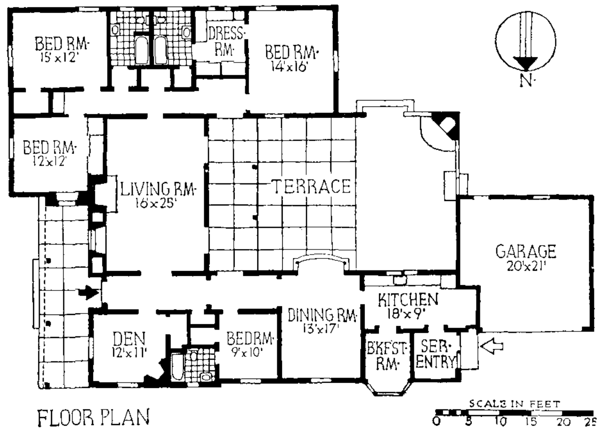
A. "Shallow closets are economical of floor space, and open-face trays are useful for folded wearing apparel. The cost of hardware is not great, in fact most doors slide in hardwood grooves using small Domes of Silence (the common glides used on chair legs) on the bottom of the doors. The doors, in many cases, are of plywood."

Cubage: 29,000. Cost: $10,800 at 37 cents a cubic foot.

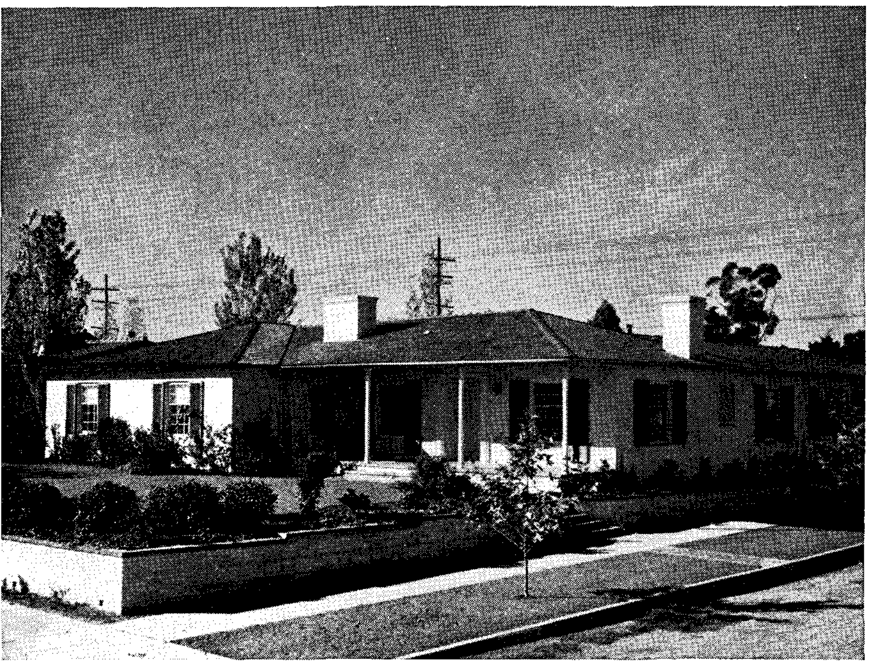


Floyd Ray

INTERIOR COURT



FLOOR PLAN



Inman Co.

STREET ELEVATION

CONSTRUCTION OUTLINE

STRUCTURE
Exterior walls—1 in. cement plaster, 16 gauge 1½ in. mesh wire lath, brownskin paper, Brown Co., applied against horizontal tie wires, wood studs, rock lath, hardwall plaster, U.S. Gypsum Co. Floor construction—2 x 10 in. joists, 1 x 6 in. diagonal sub-floor, ½ x 2 in. clear plain white oak.

ROOF
Covered with Royal cedar shingles.

CHIMNEY
Terra cotta flue lining, Gladding, McBean & Co. Damper—Superior, Superior Fireplace Co.

SHEET METAL WORK
Flashing—galvanized iron and Lead Clad, Wheeling Metal Manufacturing Co. Gutters and leaders—galvanized iron.

WINDOWS
Sash—wood, double hung. Weatherstripping—Monarch Metal Weatherstripping Co. Glass—quality B, Libbey-Owens-Ford Glass Co.

FLOORS
Living room, bedrooms and halls—½ x 2 in. clear plain white oak. Kitchen—Sealex linoleum, Congoleum-Nairn, Inc. Bathrooms—Sealex linoleum, Congoleum-Nairn, Inc., and tile, Gladding, McBean & Co.

WALL COVERINGS
Living rooms, bedrooms and halls—wallpaper. Kitchen—Sealex wall covering—Congoleum-Nairn, Inc.

HARDWARE
Interior and exterior—P. and F. Corbin.

PAINTING
Interior: Walls and ceilings—washable wall paint. Floor—stain, fill, shellac and wax. Trim and sash—Silken White, egg shell enamel. Exterior: Walls—Lithide, Lithide Products Co., Sash and exterior woodwork—lead and oil. All paint by W. P. Fuller & Co.

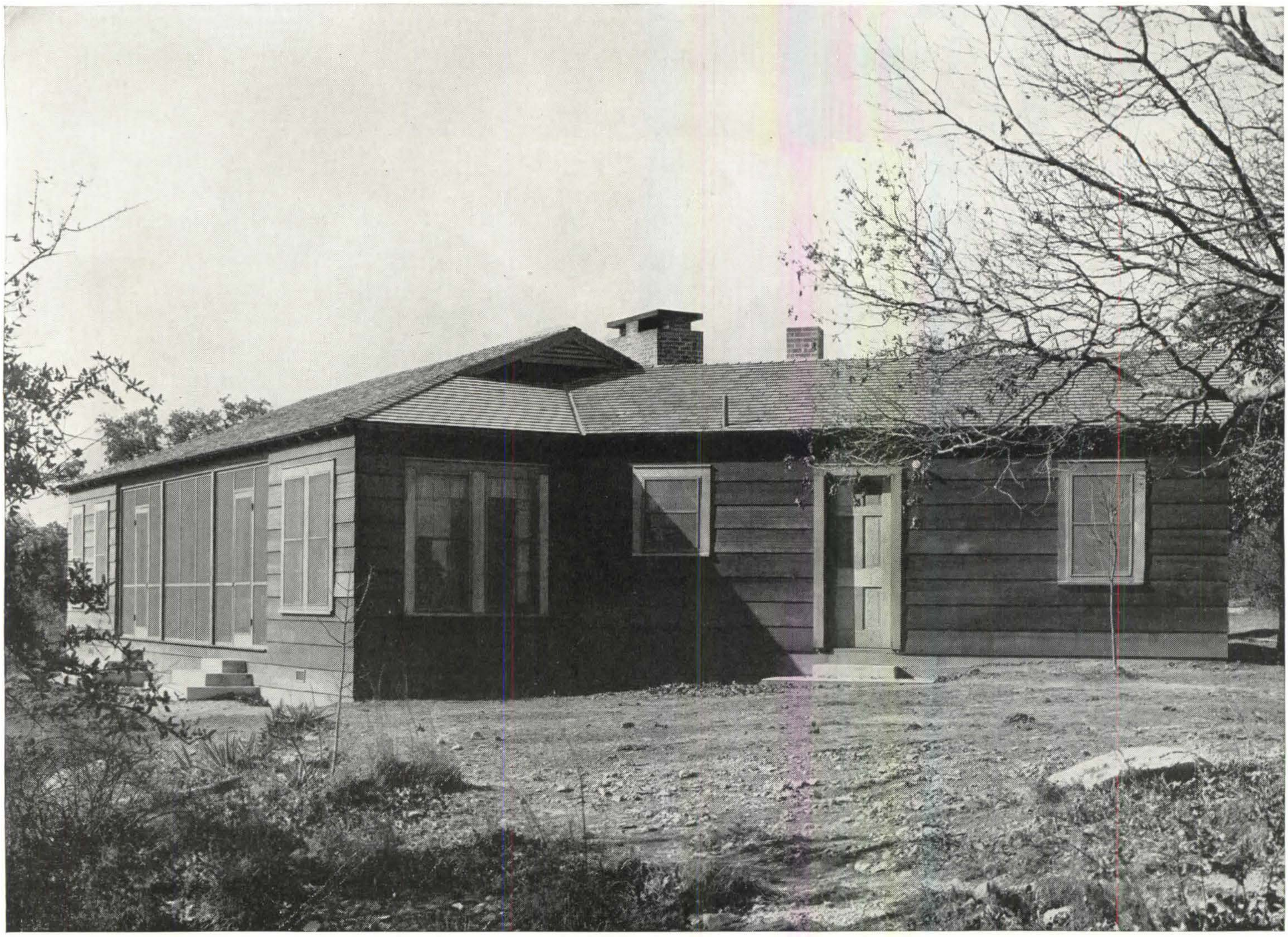
ELECTRICAL INSTALLATION
Wiring system—knob and tube. Switches—Despard, Pass & Seymour. Fixtures—Strickley, Stein & Gerard.

KITCHEN EQUIPMENT
Range—Gaffers & Stattler. Refrigerator—Electrolux, Servel, Inc. Sink—two-part, Standard Sanitary Manufacturing Co.

BATHROOM EQUIPMENT
Lavatory, tub, toilet—Standard Sanitary Manufacturing Co. Seat—two-piece compact.

HEATING
Unit heater and hot water heater.

30. HOUSE FOR GUY REID, LAKE WORTH, TEXAS

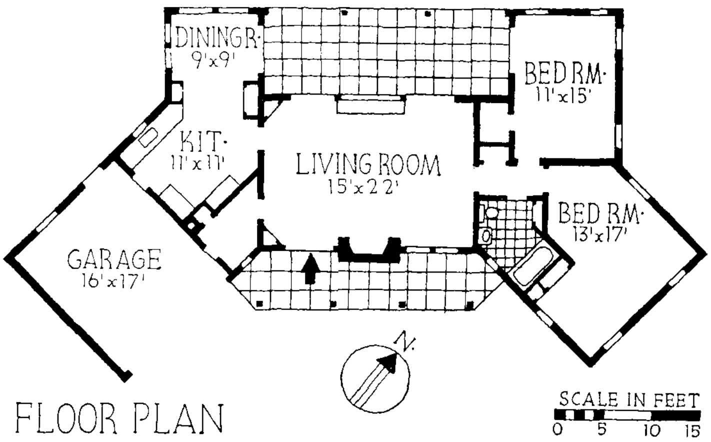


PROBLEM: A small house for a family of two; accommodations for frequent guests. A two-car garage.

Complete lack of pretentiousness is the most interesting characteristic of this house, the usual shutters and other decorations having been entirely omitted. Dark, wide siding gives an appearance of rugged simplicity, an effect which might have been further emphasized by the use of less prominent window frames.

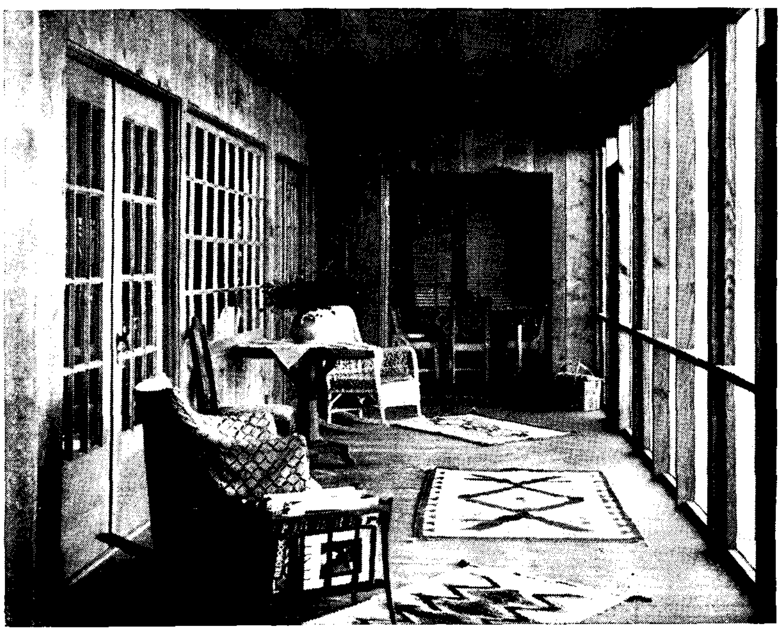
The architect comments: "The owner's desire for informal living, coupled with a lake vista, dictated the open character of the living room, and allowed a dining alcove in connection with the kitchen. All rooms open to the south and east, and protection from the western sun is given by the porch."

Cost: $3,800 (including all equipment) .



FLOOR PLAN

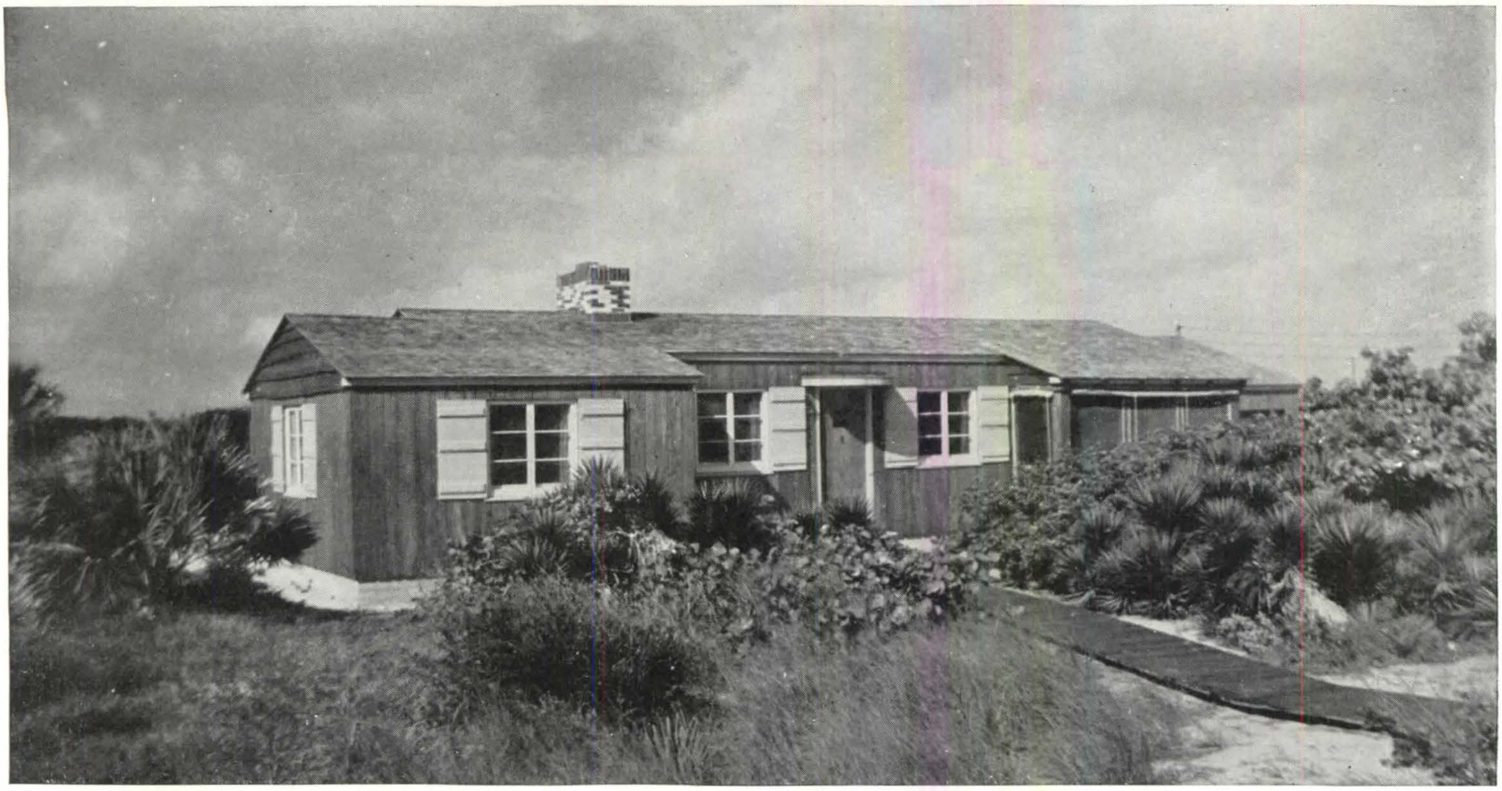
PORCH

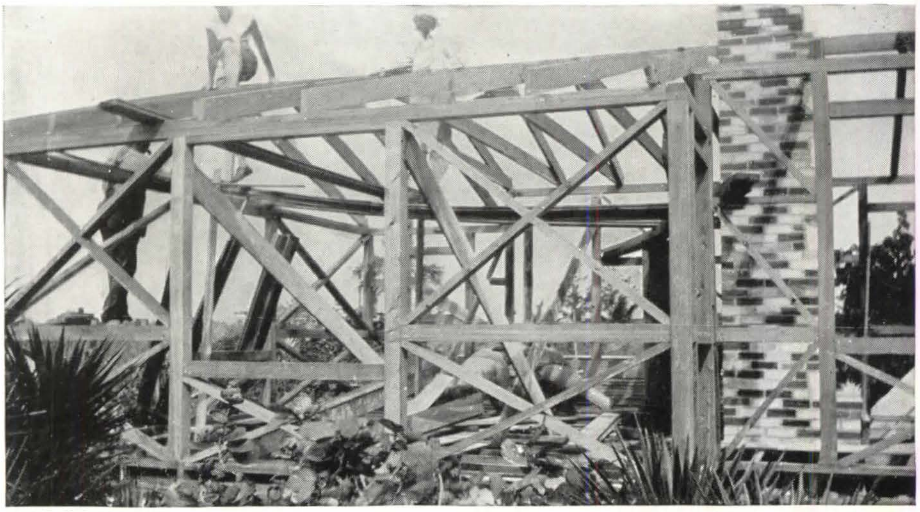


CONSTRUCTION OUTLINE

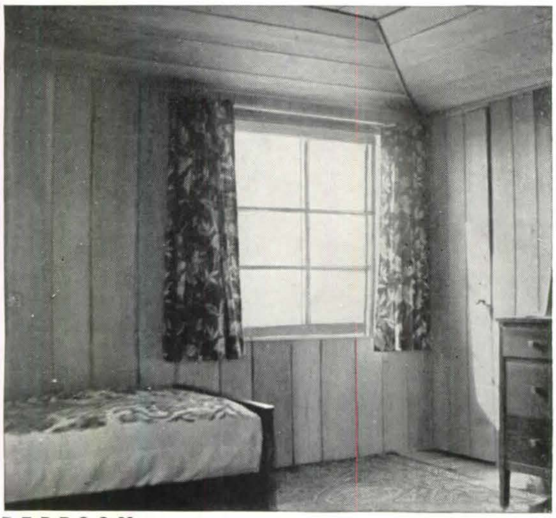
FOUNDATION
Walls—brick, Acme Brick Co.
STRUCTURE
Exterior walls—redwood siding, waterproof paper, yellow pine studs. Interior partitions—knotty pine, vertical boarding and Celotex, The Celotex Co.
ROOF
Cedar shingles over shingle lath.
WINDOWS
Sash—yellow pine. Glass—Pennvernon, Pittsburgh Plate Glass Co.
FLOORS
Main rooms—oak. Kitchen and bathrooms—linoleum, Armstrong Cork Products Co.
WOODWORK
Doors—yellow pine. Trim—white pine.
HARDWARE
Interior and exterior—P. & F. Corbin.
PAINTING
Exterior: Roof—natural. Siding, trim and sash—raw linseed oil. Interior—oil color and brushed oil on knotty pine. Paint materials by Pittsburgh Plate Glass Co.
ELECTRICAL INSTALLATION
Wiring system—BX conduit. Fixtures—direct, National Co.
PLUMBING
All fixtures by Standard Sanitary Manufacturing Co. Septic Tank disposal.
HEATING
Bottled gas. Hot water heater—The Standard Electric Stove Co.

31. HOUSE FOR WILLARD D. SAULNIER, FORT LAUDERDALE, FLA.





STRUCTURE



BEDROOM

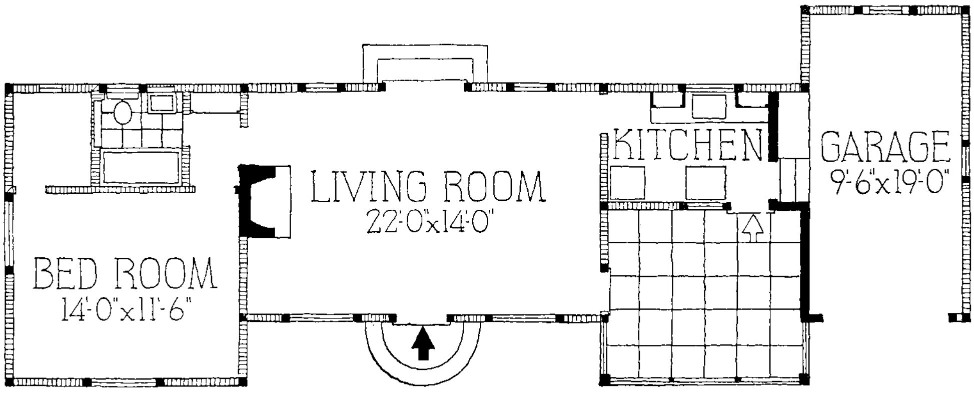
PROBLEM: "To design a bachelor's informal winter quarters in South Florida. The project and its location demanded a hurricane-proof house. The owner desired a house of native materials to blend in with a sub-tropical setting of sea grape, yucca, palmettos, palms, and dune grass.

An excellent solution, both in plan and exteriors; harmonious with its surrounding and unpretentious.

The architect comments: "The house is approximately 200 ft. from the ocean. Its elongated plan was chosen for view and ventilation. An ample living room, a double bedroom, and a large closet were the only specific room requirements. The owner occupies the house about eight months of the year.

"A fireplace was a necessity and would have been more useful with an auxiliary hot air circulating unit. The kitchen is small but complete, and has 70 cubic feet of storage space. Formal dining space was not considered necessary. Built-in bunks on the porch and in the living room provide overflow accommodations."

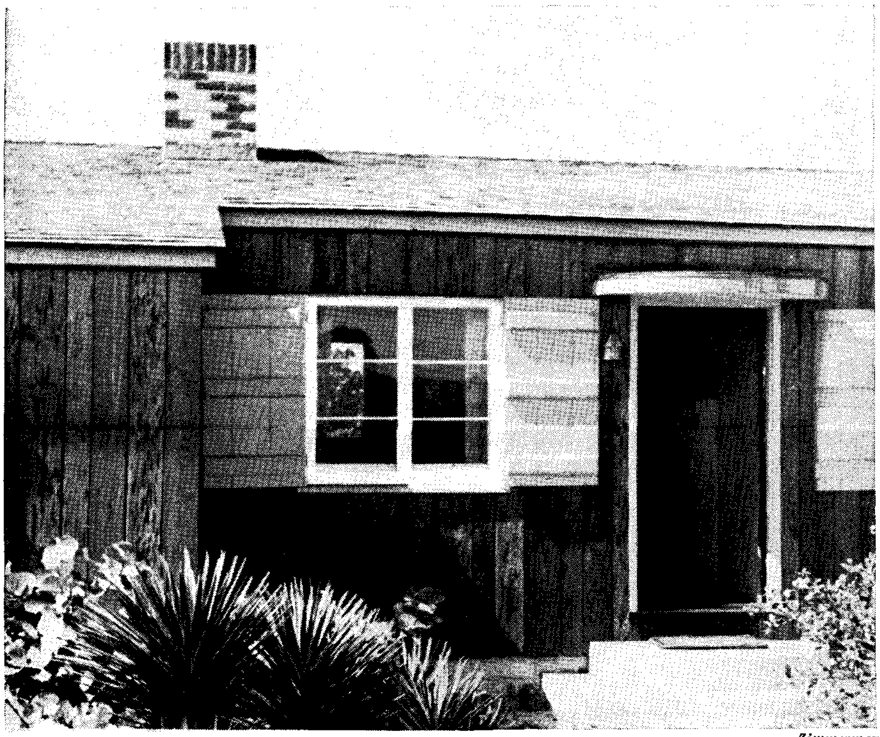
Cubage: 12,000. Cost: $3,450 at 29 cents a cubic foot.



FLOOR PLAN

NOTE: "Wind bracing, needed because winds frequently attain hurricane intensity, was simplified by wide stud spacing. The construction was developed for a cypress manufacturer by L. W. Butchart and Robert Hansen to create a market for the manufacturer's 2 in. cypress planks. Pecky cypress, while worm-eaten in appearance, is highly resistant to decay.

"Rafters were anchored to the frame by loops of galvanized plumber's strap iron. The frame is anchored through the concrete block foundation walls to the reenforced concrete footing by ⅝ in. round rods spaced about 5 in. on center."



ENTRANCE DETAIL

Zimmerman

CONSTRUCTION OUTLINE

STRUCTURE
Exterior walls—2 in. pecky cypress board siding over 4 x 4 in. cypress studs, 4 ft. o. c. braced in each panel. Interior partitions—cypress vertical sheathing. Floor construction—2 x 10 in. cypress joists, 1 in. cypress sub-floor, 8 in. pine planks.

ROOF
Cypress rafters and sheathing covered with random red cedar shingles over 30 lb. felt, Weatherbest Corp.

CHIMNEY
Red clay brick with terra cotta flue lining.

SHEET METAL WORK
Flashing—16 oz. copper, American Brass Co.

WINDOWS
Sash and frame—cypress wood, casement, Gate City Sash & Door Co. Glass—double strength, quality B. Screens—No. 18 bronze mesh in removable cypress frames.

FLOORS
All rooms—yellow pine. Kitchen and bathrooms—covered with linoleum, Armstrong Cork Products Co.

WALL COVERINGS
Bathrooms—Marlite wainscot, 4 ft. over tub, Marsh Wall Products Co.

HARDWARE
Interior—Yale & Towne Manufacturing Co., McKinney Manufacturing Co. and Washington Hardware Co. Garage door—overhead type, Frantz Manufacturing Co.

PAINTING
Interior: Trim, sash and bathrooms and kitchen ceilings—white, semi-gloss enamel, Boston Varnish Co. Floors—hot linseed oil and pigment, Old English wax, A. S. Boyle Co. Exterior: Walls—refined creosote and pigment.

ELECTRICAL INSTALLATION
Wiring system—sheathed cable, General Electric Co. Switches—Bakelite Corp. Fixtures—direct and indirect, Studio of Lighting, Inc. and Lightolier Co.

KITCHEN EQUIPMENT
Stove and refrigerator—Westinghouse Electric & Manufacturing Co. Sink—Kohler Co., linoleum covered drainboard, Armstrong Cork Products Co.

BATHROOM EQUIPMENT
Cabinet—Miami Cabinet Div., Philip Carey Co. All other fixtures—Kohler Co.

PLUMBING
Pipes: Soil and waste—cast iron. Water supply—wrought iron, A. M. Byers Co. Water pump—shallow well type and reenforced concrete septic tank, Deming Co.

HEATING
Hot water heater—10 gallon insulated automatic.

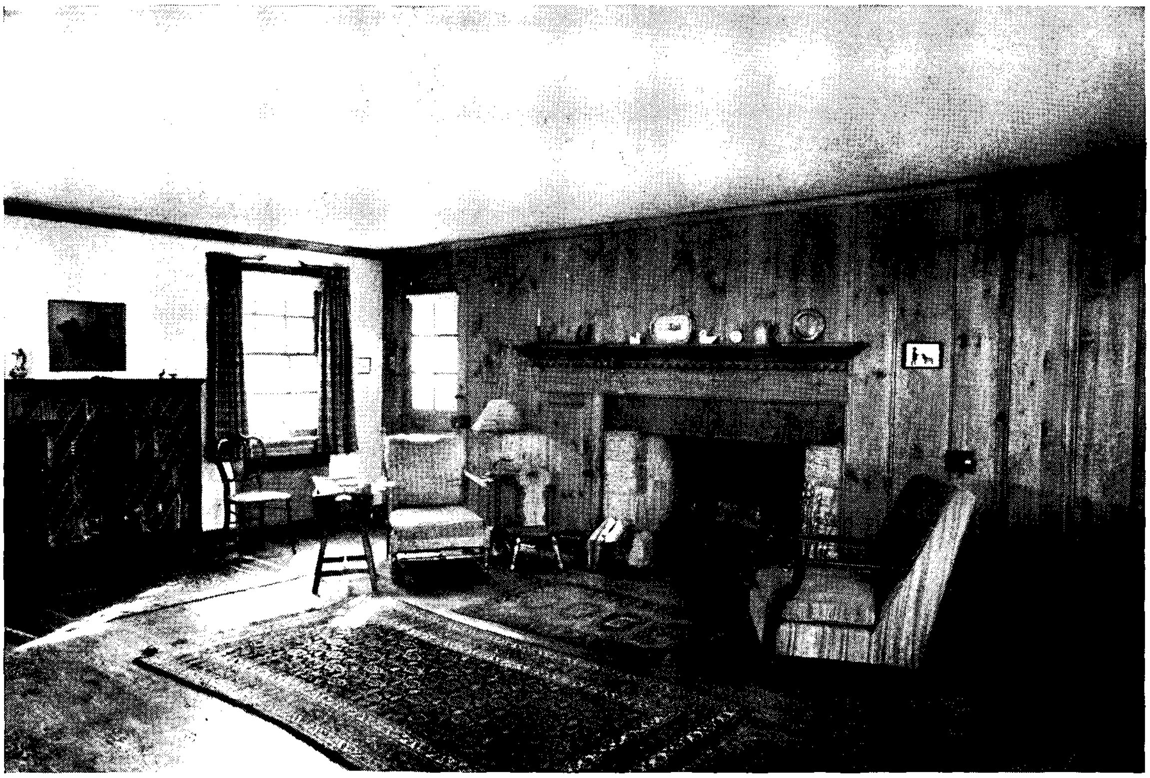
32. HOUSE FOR FRANCIS H. WYETH, LAVEROCK, PENNA.

P. B. Wallace

An interesting and unusual plan. Note the use of the end of the living room as part of the circulation. The combination of laundry and service entry is an excellent feature which is being increasingly used.

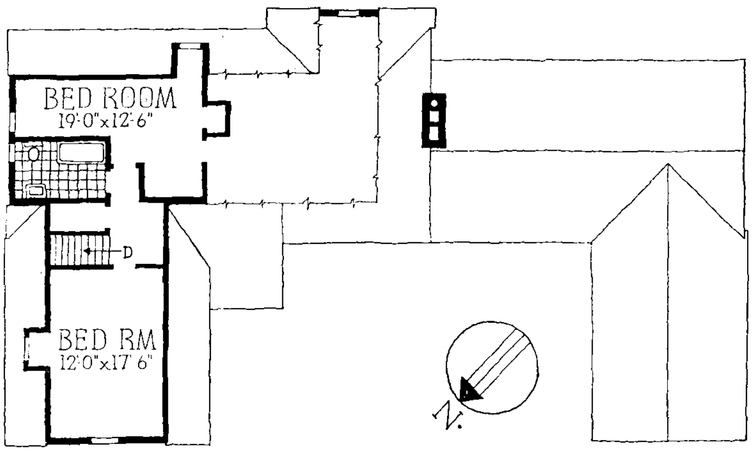
The architect comments: "Due to a former illness, the client stipulated that the majority of the rooms be on one floor. For the protection and supervision of the two small children, the court formed by the wings was fenced in. As for style, the client specified a New England type of bungalow with a rambling plan."

Cost about 35 cents a cubic foot.

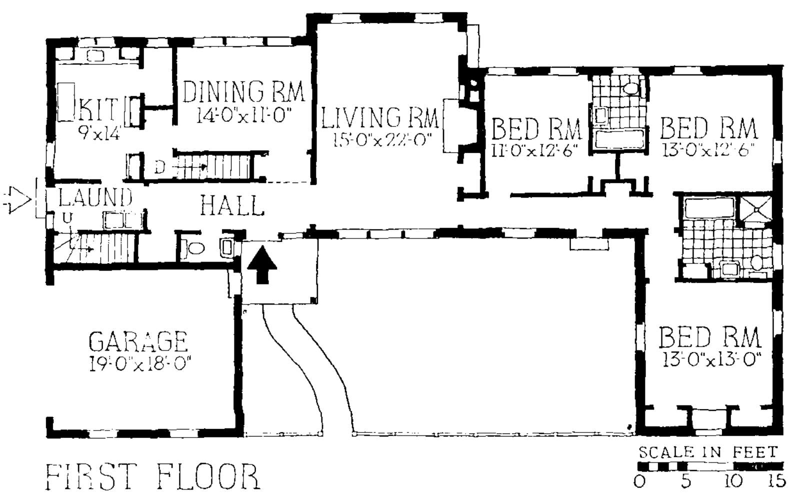


LIVING ROOM

C. V. D. Hubbard



SECOND FLOOR

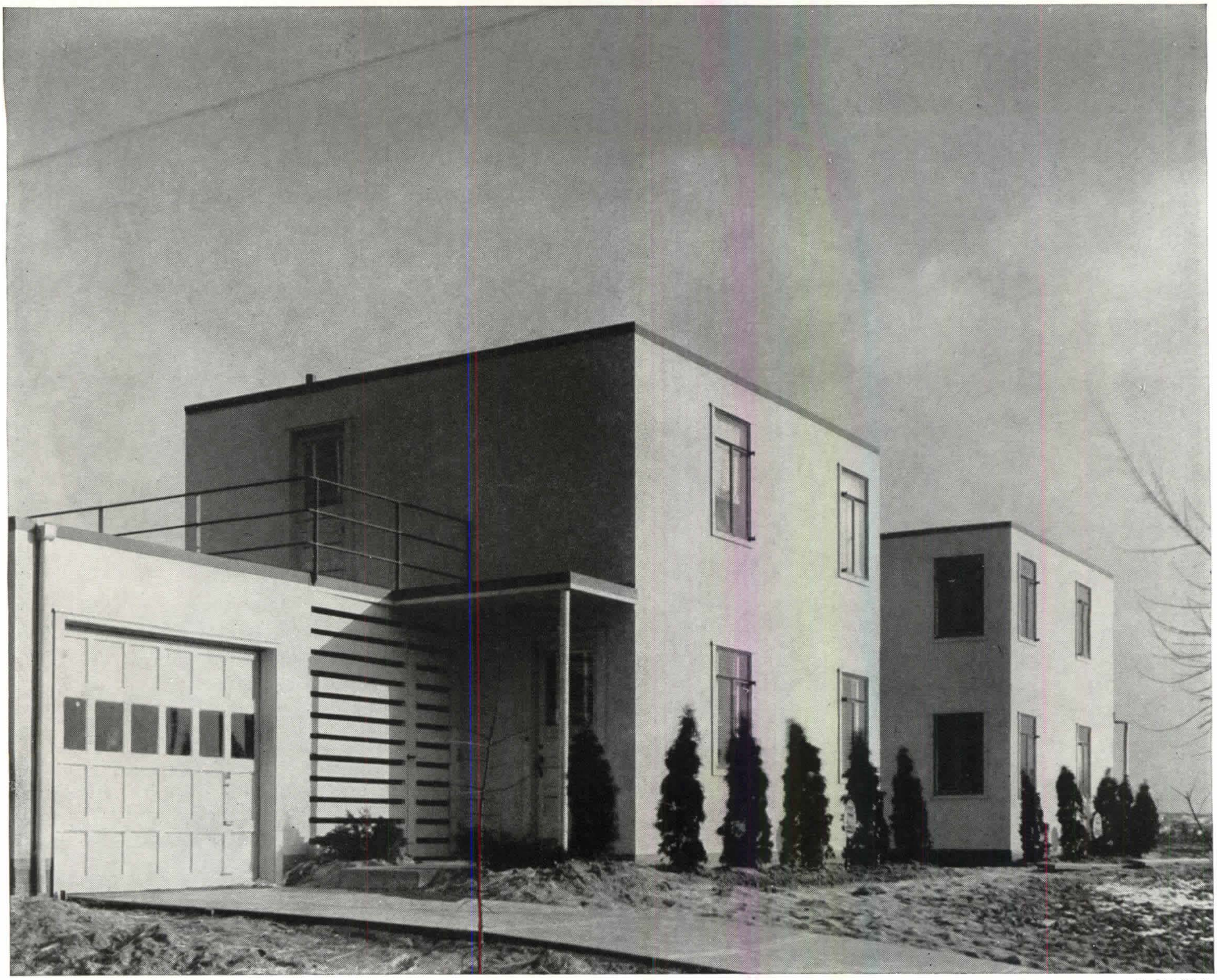


FIRST FLOOR

CONSTRUCTION OUTLINE

STRUCTURE
Exterior walls—used brick, 1 x 2 in. furring, insulation lath and plaster. Interior partitions—studs, rock lath and plaster, U.S. Gypsum Co. Floor construction—wood joists, sub-floor; finish—oak and pine.
ROOF
Royal cedar shingles.
CHIMNEY
Lining—terra cotta.. Damper—H. W. Covert Co.
INSULATION
Outside walls, attic floor and roof—1 in. Arborite, Atlantic Gypsum Products Co. Weatherstripping—spring bronze and interlocking.
WINDOWS
Sash—double hung, Idaho pine. Frame—cypress. Glass double thick, quality A, Pittsburgh Plate Glass Co.
FLOORS
Living room, bedrooms and halls—oak. Kitchen and bathrooms—pine, covered with linoleum, Armstrong Cork Products Co.
WALL COVERINGS
Wallpaper throughout.
WOODWORK
Trim in living room and hall—knotty pine. Shelving and cabinets—Poplar. Interior doors—special batten in living room and hall; remainder—stock, 6-panel. Exterior doors: Front—built-up; others—special with glass panel. Garage doors—overhead type, J. G. Wilson Co.
PAINTING
Trim and floors in living room and halls—stained and waxed; remainder—painted, Pittsburgh Plate Glass Co. Exterior—Bondex, waterproof paint, Reardon Co.
ELECTRICAL INSTALLATION
Wiring system—B. & G. Switches—toggle type. Fixtures—direct, Walker Kepler.
KITCHEN EQUIPMENT
Stove—gas. Refrigerator—General Electric Co. Sink—Standard Sanitary Mfg. Co.
LAUNDRY EQUIPMENT
Sink—soapstone tubs.
BATHROOM EQUIPMENT
All fixtures by Crane Co.
PLUMBING
Pipes: Soil and waste—cast iron. Water supply—copper, Mueller Brass Co.
HEATING
Hot water system, oil furnace. Boiler and radiators—cast iron, U.S. Radiator Corp.

33. HOUSE GROUP IN CLEVELAND, OHIO



Carl F. Waite

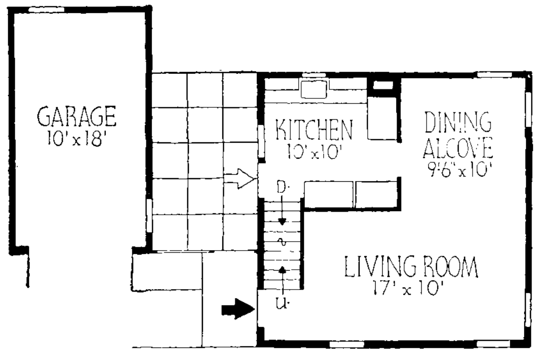
These houses, the first of a contemplated group, are built of frameless steel panels, a method of construction developed in collaboration with Mills G. Clark, who has studied the possibilities of prefabrication in steel for a number of years.

The architects comment: "The houses permitted study in field operation and erection practices. The method of assembly presents continuous smooth steel surfaces on both the exterior and interior walls without visible screws or butted edges.

"The solution of the basic stock plan permits the use of prefabricated houses, individually or in groups, with complete flexibility for orientation. Group arrangements are possible without apparent repetition.

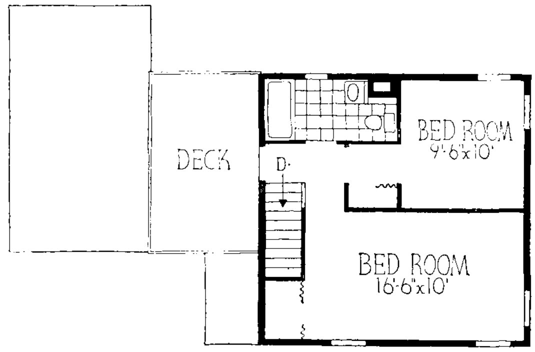
"The accompanying plot plan shows the block on which the final test houses have been erected. The other houses on the plot are the new stock units which will be placed as shown."

Cost per unit: approximately $5,000.



FIRST FLOOR

SCALE IN FEET
0 5 10 15



SECOND FLOOR

CONSTRUCTION OUTLINE

FOUNDATION
Walls—Haydite concrete block, continuous. Waterproofing—waterproof cement and asphalt.

STRUCTURE
Steel sheets, 18 gauge, bent into units which form wall surface and integral studs. Interior and exterior units identically spaced apart without metallic contact through panel. Finished wall 4 in. flat steel surface on both sides.

ROOF
Same as walls but covered with 4-ply Barber asphalt roofing, Barber Asphalt Cement Co. Deck construction—covered with 4-ply Barber Asphalt Co.'s deck surfacing.

CHIMNEY
Lining—tile.

SHEET METAL WORK
Flashing and gutters—galvanized iron.

INSULATION
Outside walls and roof—4 in. rock wool, General Insulating & Manufacturing Co. Weatherstripping—copper and bronze thresholds.

WINDOWS
Casement with wood frame, Vento Steel Sash Co. Glass—Pennvernon, Pittsburgh Plate Glass Co. Screens—copper in Vento hinged metal frame, Vento Steel Sash Co.

STAIRS
All 14 gauge steel.

FLOORS
All rooms—plywood. Kitchen and bathrooms—covered with linoleum, Armstrong Cork Products Co.

WALL COVERINGS
Living room, bedrooms and halls—wallpaper.

WOODWORK
Trim, shelving and cabinets—white pine. Garage doors—overhead type, Crawford Door Co.

HARDWARE
Interior and exterior—P. & F. Corbin.

PAINTING
Exterior walls—Sherwin-Williams Co.'s shop-baked prime and cement paint.

ELECTRICAL INSTALLATION
Wiring system—flexible conduit. Switches—General Electric Co. Fixtures—semi-direct.

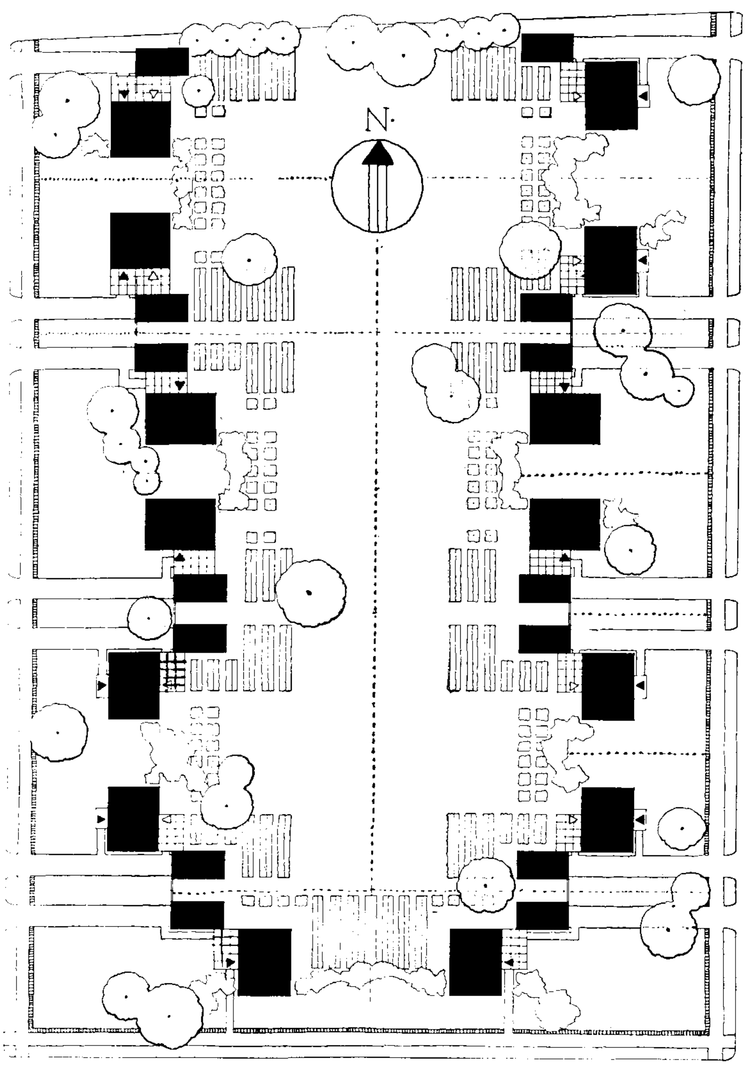
KITCHEN EQUIPMENT
Stove and refrigerator—Sears, Roebuck & Co. Sink, dishwasher and cabinet—complete unit, The Kitchen Maid Corp.

LAUNDRY EQUIPMENT
Sink—Kohler Co.

BATHROOM EQUIPMENT
Fixtures by Briggs Manufacturing Co.

PLUMBING
Pipes: Soil and waste—cast iron. Water supply—brass, Mueller Co.

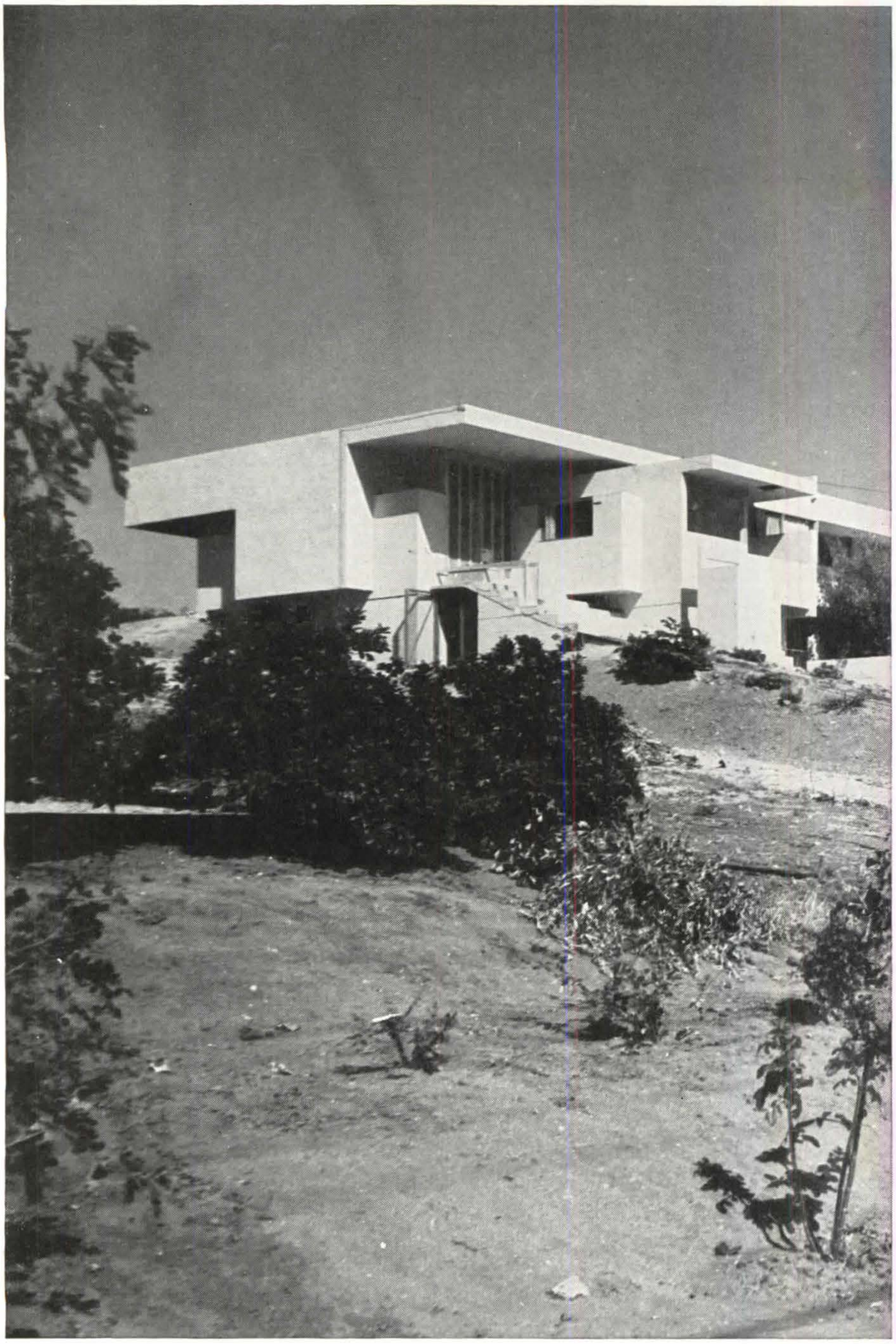
HEATING AND AIR CONDITIONING
Warm air, gas furnace, Rudy Furnace Co. Air conditioning—humidified.



BLOCK PLAN

SCALE IN FEET
0 10 70

34. HOUSE FOR V. McALMON, LOS ANGELES, CALIF.



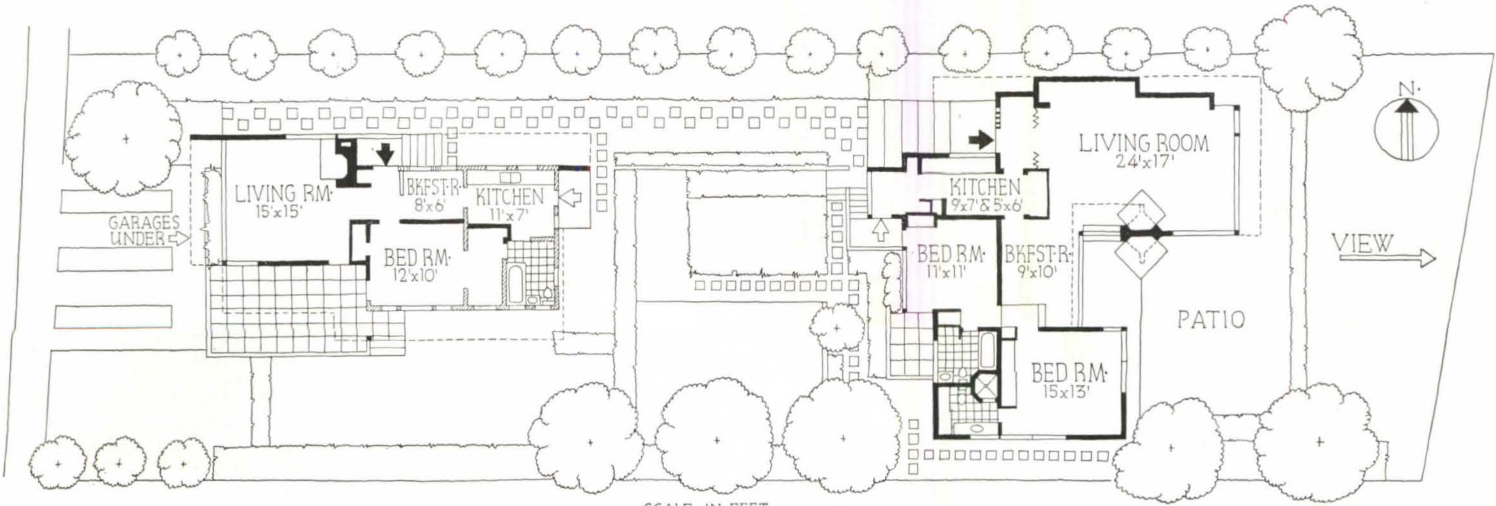
NORTHWEST ELEVATION, NEW HOUSE

PROBLEM: On a steep lot, with a good view to th[e] east, to build a two-bedroom house. An existing house lower on the property, to be modernized for renta[l] purposes.

The new house was built at the rear (an[d] top) of the property, with glass used exten[-]sively to take advantage of the view. Th[e] pronounced overhangs are characteristic o[f] Mr. Schindler's work, and serve not only fo[r] protection from the intense sunlight, but giv[e] plasticity to the composition. An interestin[g] feature of the plan is the pantry-like extensio[n] of the kitchen where a dining table on wheel[s] may be set and then moved to any part o[f] the house or patio.

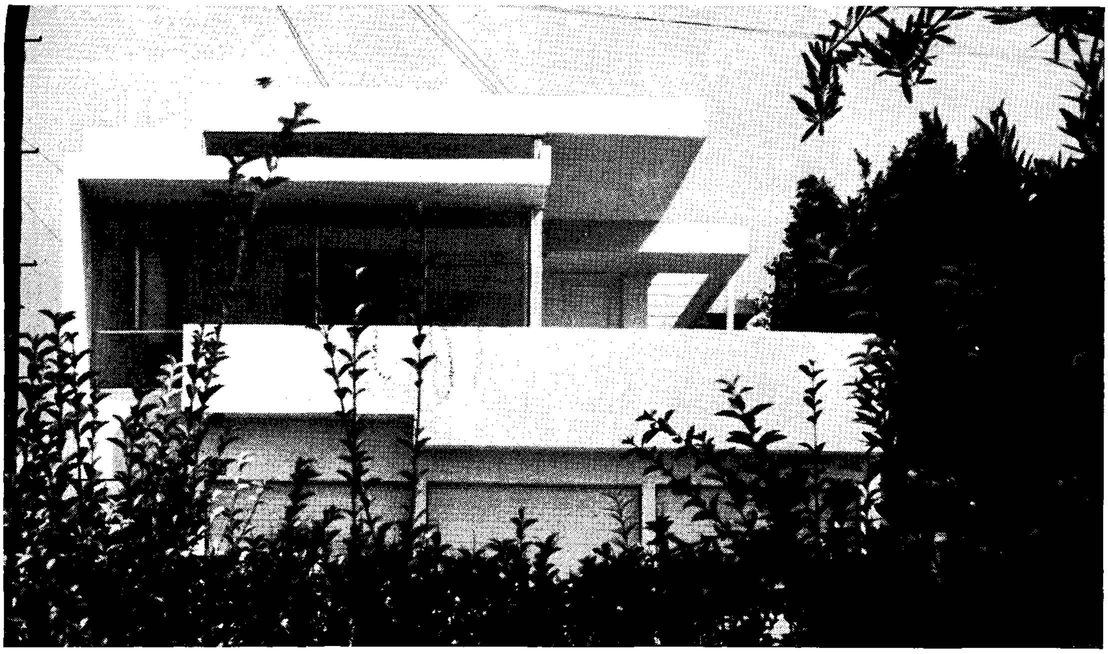
The existing house was given its own privat[e] garden, and a new living room was added.

Cubage: 24,000. Cost: \$7,200 at 30 cents [a] cubic foot.



PLAN OF REMODELED HOUSE

PLAN OF NEW HOUSE

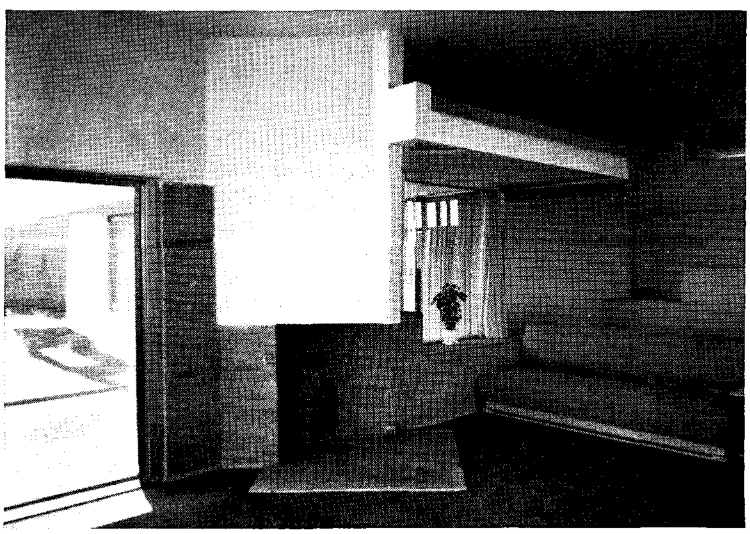


Julius Shulman Photos

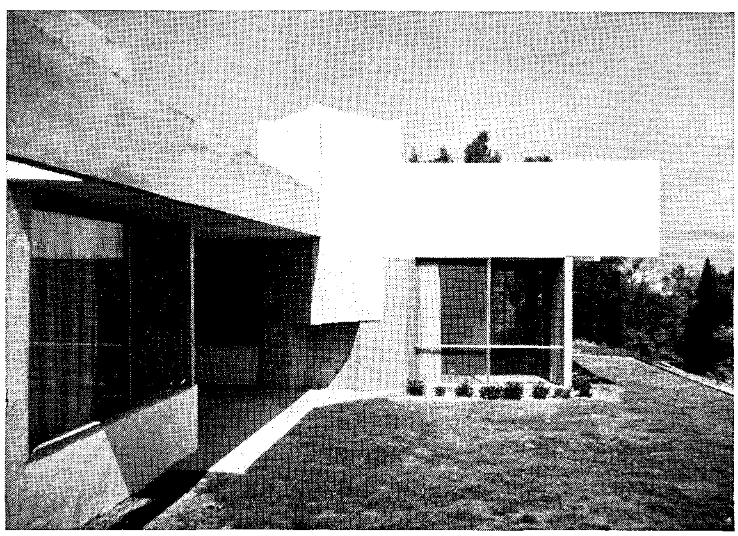
REMODELED HOUSE

CONSTRUCTION OUTLINE

FOUNDATION
Walls—concrete.
STRUCTURE
Exterior—stucco, wire lath, roofing paper, wood frame, wood lath and plaster. Floor construction—concrete joists, 2 in. plank flooring.
ROOF
Composition roofing. Deck construction—concrete floor.
CHIMNEY
Terra cotta lining.
SHEET METAL WORK
Flashing and gutters—galvanized iron.
WINDOWS
Sash—sliding sheet metal, special design. Glass—3-16 in. window glass. Screens—galvanized iron.
FLOORS
Living room—carpet. Bedrooms—hardwood. Kitchen and bathrooms—linoleum.
HARDWARE
Interior and exterior—Schlage Lock Co.
ELECTRICAL INSTALLATION
Wiring system—conduit. Fixtures—built-in, direct and indirect.
KITCHEN EQUIPMENT
Refrigerator—Frigidaire Sales Corp.
HEATING
Warm air, gas fired furnace.

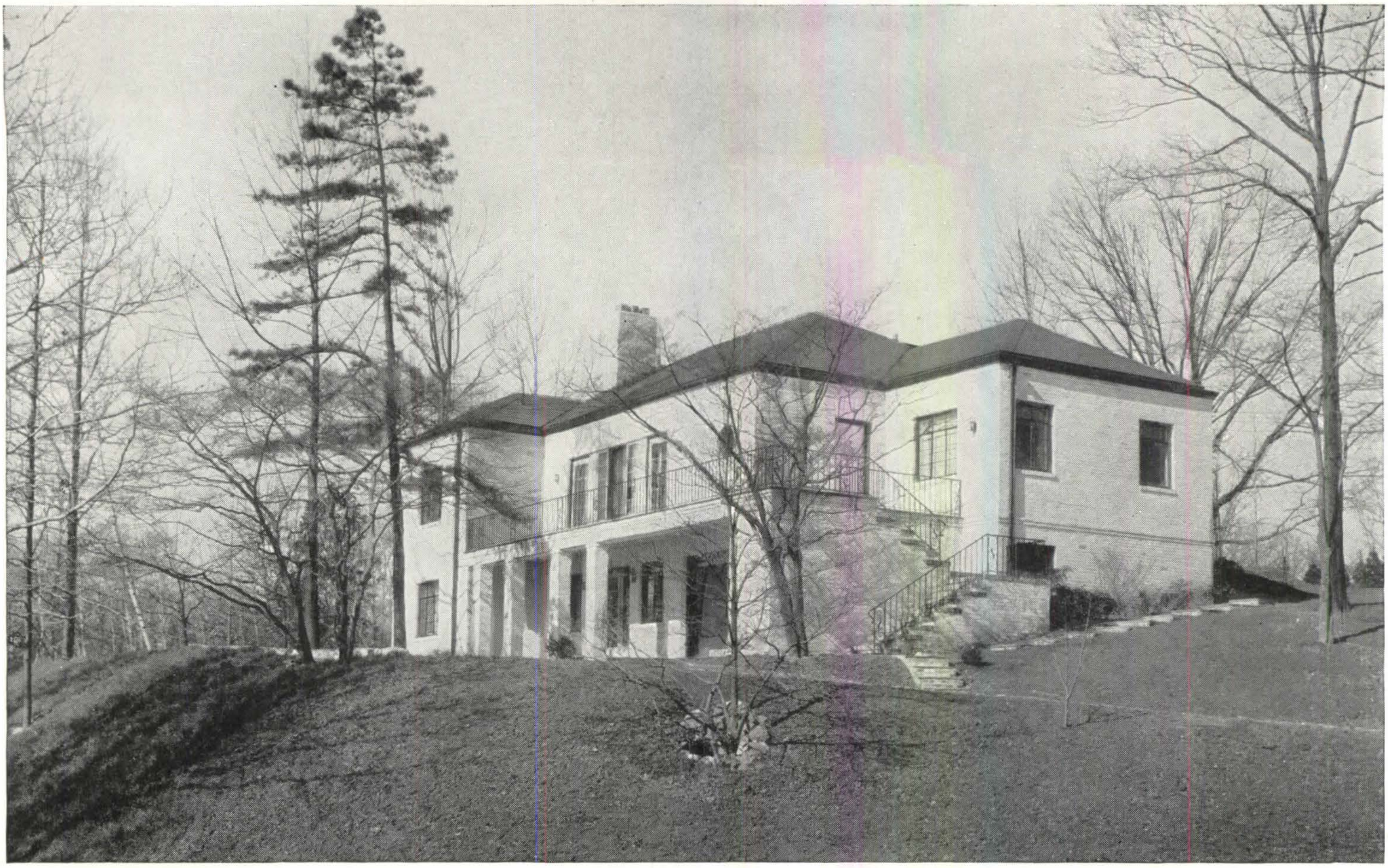


LIVING ROOM



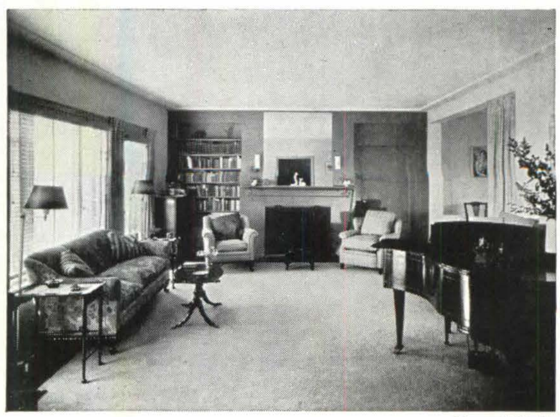
PATIO

35. HOUSE FOR CHARLES PRANGE, SHORT HILLS, N. J.

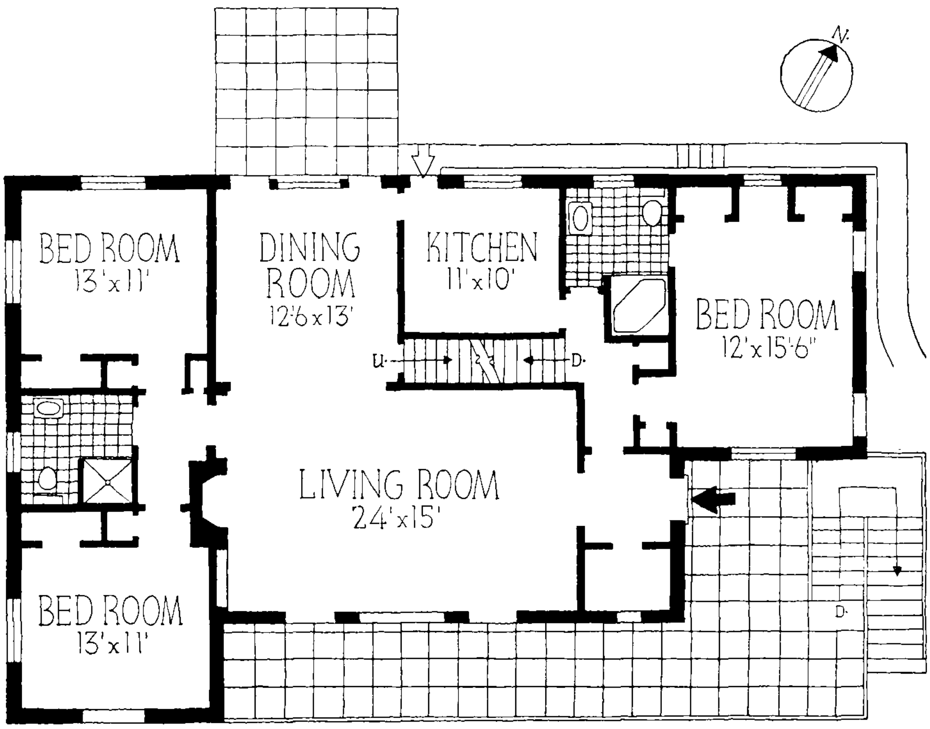


PROBLEM: A house for a couple and two children of high school age. Family has frequent guests. Maid.

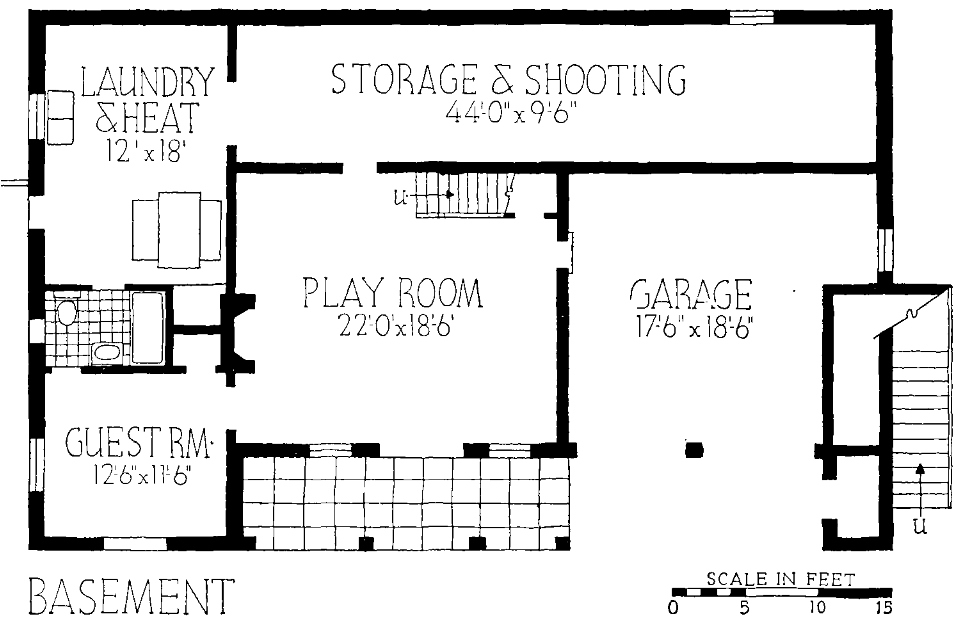
The plan of this residence is of particular interest. Entrance is on the lower level, with access from the garage through the playroom. The guest room is on this lower level, a most desirable arrangement which gives both guest and family the maximum of privacy. The shooting gallery is an amusing addition to the usual recreation facilities. The slope has made possible a play room above ground, and also the creation of a deck on the level above. This area considerably extends the facilities provided by the combined living and dining room. Bedrooms on this level are also separated into groups. The kitchen, it will be noted, is placed so that access to the front door is convenient and does not disturb activities in the living or dining rooms.
Cost: $15,830 at 35 cents a cubic foot.



Channel Studio



FIRST FLOOR



BASEMENT

CONSTRUCTION OUTLINE

FOUNDATION
Walls—concrete block. Cellar floor—4 in. concrete on 6 in. cinder fill. Waterproofing: Floors—integral; walls —hot tar and 2-ply asphalt felt.

STRUCTURE
Exterior walls: First story—concrete block, brick veneer. Second story—wood frame brick veneer, 3 coats plaster inside.

ROOF
Construction—sheathing and asphalt felt covered with black Bangor slate. Deck construction—pine flooring covered with heavy canvas, 3 coats paint.

CHIMNEY
Lining—terra cotta. Damper—H. W. Covert Co.

SHEET METAL WORK
Flashing and leaders—copper. Gutters—lead coated tin.

INSULATION
Outside walls, attic floor and roof—rock wool.

WINDOWS
Fenestra screened casements, Detroit Steel Products Co.

STAIRS
Treads—birch. Handrail—oak.

FLOORS
Living room, bedrooms and halls—red oak. Kitchen—pine floor covered with linoleum. Bathroom—tile.

WOODWORK
Interior doors—flush, white pine. Exterior doors—2 in. glazed white pine.

HARDWARE
Interior and exterior—Schlage Lock Co.

PAINTING
Interior walls, ceilings, trim and sash—3 coats paint. Floors—Minwax flat finish, Minwax Co. Exterior walls —2 coats whitewash.

ELECTRICAL INSTALLATION
Wiring System—BX. Switches—Diamond H, Hart Manufacturing Co. Fixtures—indirect, hanging.

KITCHEN
Stove—gas. Refrigerator—General Electric Co. Sink—stainless steel.

PLUMBING
All fixtures by Standard Sanitary Manufacturing Co. Pipes: Soil and waste—cast iron. Water supply—brass.

HEATING
Oil burner, Fox Furnace Co. Hot water heater—Ruud Manufacturing Co.

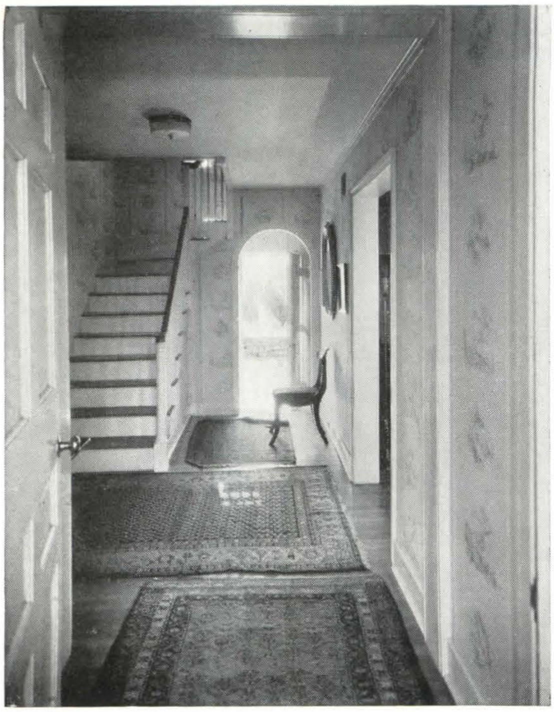
36. HOUSE FOR C. D. RAWSTORNE, BETHLEHEM, PENNA.

PROBLEM: To design a house for a couple, with guest accommodations for their grown children.

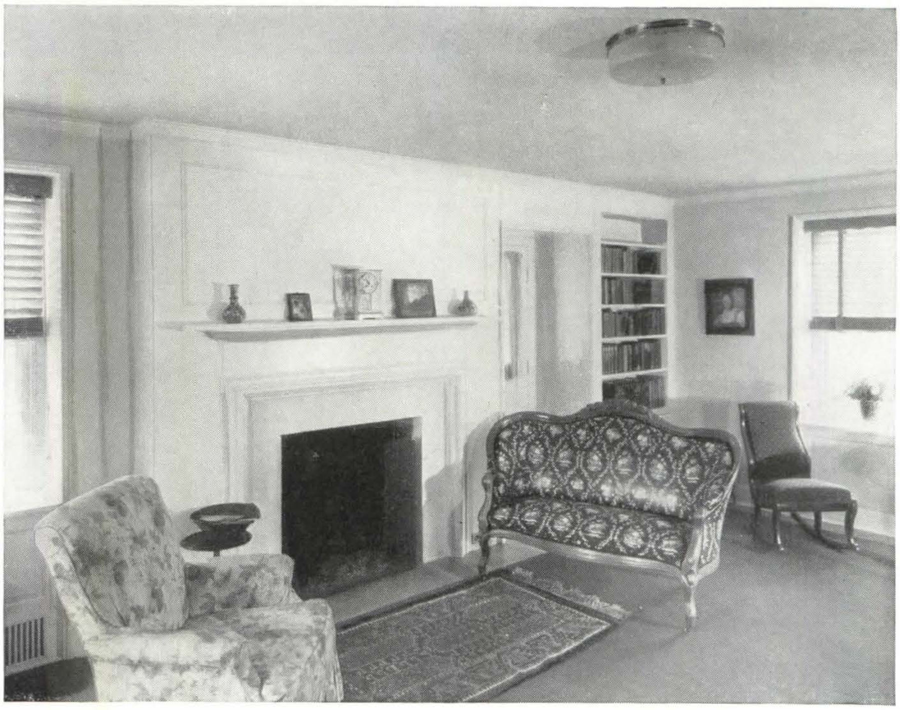
A problem in orientation was presented by the site which has its best view to the north. This was solved by the development of a long narrow plan, so that the main rooms might not only have a view to the north, but exposure on the south as well. The narrow plan was also suggested by the lot, which is 100 feet wide by 250 feet deep.

The architect comments: "The house was unusually well built due largely to the manner in which the construction was carried on. Sub-contracts were let directly by the owner on recommendation of the architect, and the carpentry and general construction work was done by a small builder-carpenter who has an unusual appreciation of good workmanship. The owners were particularly pleased with the winter air conditioning system, and with the special storage facilities which were developed in the kitchen."

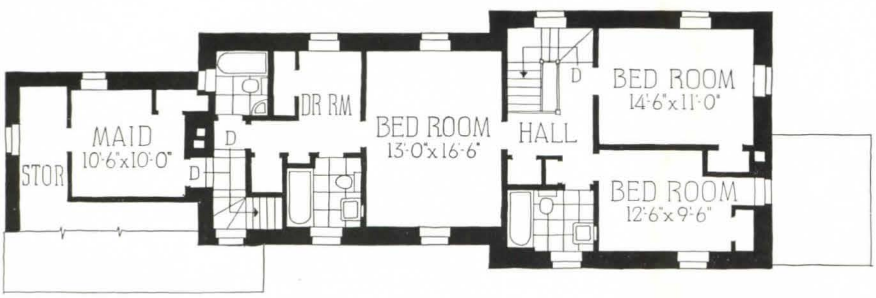
Cubage 35,800. Cost: $14,700 at 41 cents a cubic foot.



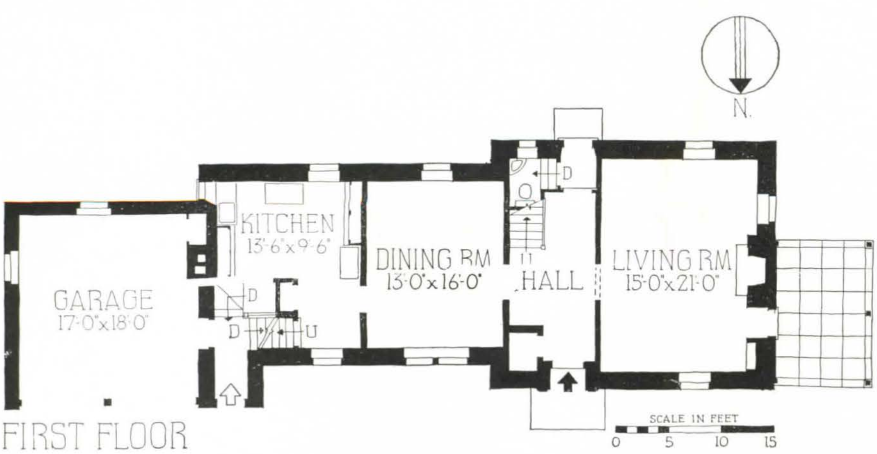
HALL



LIVING ROOM



SECOND FLOOR



FIRST FLOOR

CONSTRUCTION OUTLINE

FOUNDATION
Walls—stone with reenforced concrete footings. Cellar floor—concrete on cinder fill.

STRUCTURE
Exterior walls—local stone, 2 x 3 in. furring, rock lath and plaster, U.S. Gypsum Co.

ROOF
Wood joists, covered with rough texture slate.

CHIMNEY
Lining—terra cotta. Damper—H. W. Covert Co.

SHEET METAL WORK
Flashing, gutters and leaders—copper.

INSULATION
Roof—1 in. balsam wool blanket, Wood Conversion Co. Weatherstripping—interlocking zinc strip.

WINDOWS
All white pine. Glass—quality A. Screens—bronze mesh on wood frame.

STAIRS
Treads—oak. Newels and handrail—cherry.

FLOORS
Living room, bedrooms and halls—white oak over yellow pine sub-floor. Kitchen and bathrooms—linoleum, Armstrong Cork Products Co.

WALL COVERINGS
All rooms—wallpaper. Bathroom—linoleum, Armstrong Cork Products Co.

WOODWORK
Trim—white pine. Doors—6-panel, Morgan Sash & Door Co.

HARDWARE
Interior and exterior—solid brass, P. & F. Corbin.

PAINTING
Interior trim—5 coats enamel. Exterior woodwork—lead and oil.

ELECTRICAL INSTALLATION
Wiring system—BX cable. Switches—Hart & Hegeman. Fixtures—direct.

KITCHEN EQUIPMENT
Stove—Hotpoint, Edison General Electric Appliance Corp. Refrigerator—General Electric.

PLUMBING
All fixtures by Standard Sanitary Mfg. Co. Pipes—wrought iron.

HEATING AND AIR CONDITIONING
Winter air conditioning: direct fired Trane conditioner, Trane Co. Oil burner, and Motor Wheel oil water heater, Motor Wheel Corp.

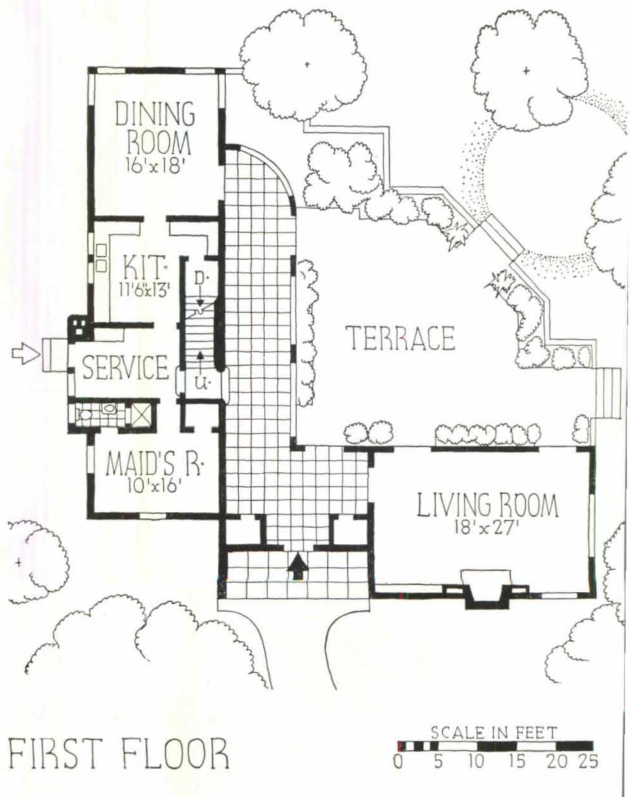
37. HOUSE FOR MITCHELL T. NEFF, ROSS, CALIF.

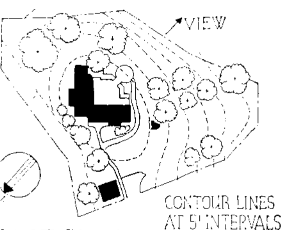
An admirable plan and an exterior which frankly expresses it.

The architect comments: "Three factors dominated the scheme: the view, the oak trees on the property, and the site, which is a small hill top. The view is pleasant in all directions, but the main room looks directly out on Mt. Tamalpais to the southwest. The oak trees are located so that one feels cupped at the top of the hill; though the slope is sharp there is no sense of falling. The owner's needs did not make for a large house, so the scale of the hill top and the house are as one.

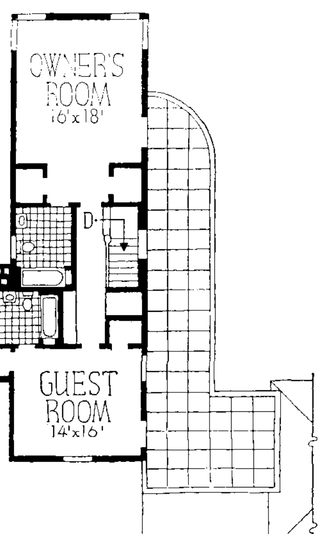
"Note how the dining room has complete privacy from the front door and the living room. Also how easily the door is answered by the service without traversing the *dining* or living room. The owner is a student and reads constantly, so the living room, not having any rooms adjacent or on top of it, is quiet and free of house interruptions.

"It represents our concept of modernity, for nothing is done as a shock to the neighborhood—nor is anything done as a sentimental or picturesque gesture."





PLOT PLAN

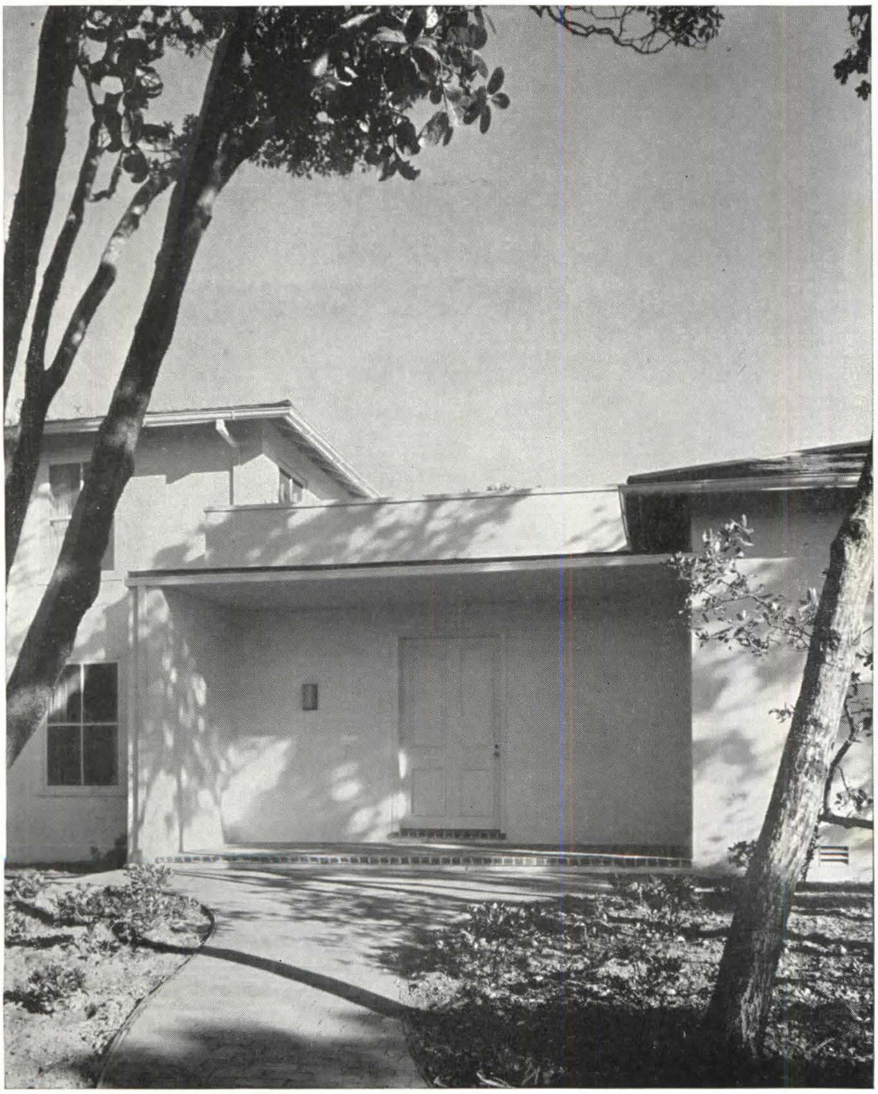


SECOND FLOOR

GALLERY

VIEW INTO DINING ROOM

ENTRANCE



CONSTRUCTION OUTLIN

FOUNDATION
Walls—concrete, continuous.
STRUCTURE
Exterior walls—cement plaster, building paper, sheathing and studs. Interior partitions—hard wall plaster o wood lath. Floor construction—Douglas fir joists, 1 x in. sub-floor. Ceiling—hard wall plaster.
ROOF
Construction—rafters, solid sheathing, 30 lb. felt an shingle tile. Deck—Douglas fir floor joists, solid sheathing, felt and tar membrane, covered with quarry til on cement mortar bed.
CHIMNEY
Brick with fire clay lining. Damper—Richardson & Boynton Co.
SHEET METAL WORK
Flashing—copper. Gutters—5 in. double roll galvanize iron.
INSULATION
Ceilings—½ in. insulating lath.
WINDOWS
Sash—double hung and casement, sugar pine. Frame—Douglas fir. Glass—single strength, quality A. Screens—bronze mesh in wood frame.
STAIRS
Douglas fir throughout.
FLOORS
Living room and bedrooms—plain select white oak Halls—hollow tile in gallery. Kitchen—linoleum covere pine. Bathrooms—linoleum over concrete covered pine
WOODWORK
Trim, shelving, cabinets and interior doors—Dougla fir. Exterior doors—sugar pine. Garage doors—redwood
PAINTING
Interior: *Trim and sash*—3 coats lead and oil. Exterior Walls—2 coats California stucco brush-coat. Sash—coats lead and oil.
ELECTRICAL INSTALLATION
Wiring system—knob and tube. Switches—by Genera Electric Co. and Hart & Hegeman.
PLUMBING
All fixtures by Kohler Co. Pipes: Soil and waste—cas iron. Hot water—galvanized wrought iron. Cold water—galvanized steel.
HEATING
Warm air, oil burning furnace.

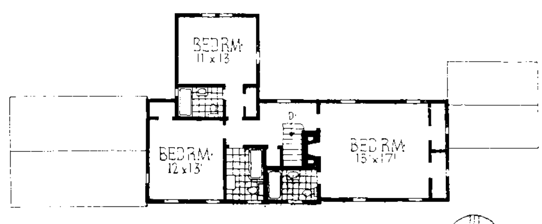
38. HOUSE FOR JOHN PELL, SANDS POINT, L. I., N. Y.

Murray M. Peters Photos

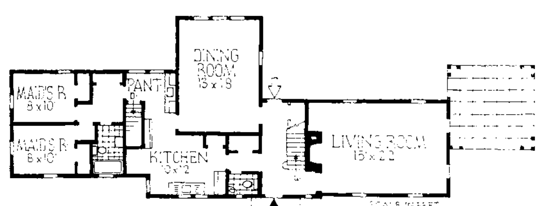
THEODORE WHITEHEAD DAVIS, ARCHITECT

PROBLEM: To design a house suitable to the requirements of a well-to-do community.

The unit plot in this community is an acre, which leaves sufficient room to spread the house out for a maximum southern exposure. An excellent arrangement in plan is the location of the kitchen adjacent to the front door. Features of the plan are the privacy of the living quarters (three complete suites upstairs), and the remoteness of servants' and garage accommodations. Cubage: 35,000. Cost: $15,000 at 43 cents a cubic foot.



SECOND FLOOR



FIRST FLOOR

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls: cedar shingles, 15 lb. building felt, sheathing, studs, wire lath and 3 coats plaster.
ROOF: Construction—2 x 6 in. rafters, 1 x 2 in. lath and 18 in. Perfection cedar shingles.
CHIMNEY: Brick with terra cotta flue lining. Damper—Old Style, H. W. Covert Co.
SHEET METAL WORK: Flashing, gutters and leaders—copper.
INSULATION: Roof—½ in. balsam wool, Wood Conversion Co.
WINDOWS: Wood, double hung, Silentite, Curtis Companies, Inc.
FLOORS: Living room, bedrooms and halls—oak. Kitchen—linoleum laid on felt over yellow pine flooring, Armstrong Cork Products Co. Bathrooms—tile.
WALL COVERINGS: Main rooms—wallpaper, Richard E. Thibaut, Inc.
WOODWORK: All white pine, Curtis Companies, Inc.
HARDWARE: Interior and exterior—brass, Schlage Lock Co.
PAINTING: Interior: Ceilings in main rooms—cold water paint. Bathroom and kitchen walls and ceilings—enamel. Floors—Minwax, The Minwax Co. Trim and Sash—lead and oil. Exterior: Roof—creosote and linseed oil.
KITCHEN EQUIPMENT: Stove—electric. Sink—double drain, Standard Sanitary Mfg. Co.
BATHROOM EQUIPMENT: Seat—C. F. Church Manufacturing Co. Cabinet—G. M. Ketcham Manufacturing Co. All other fixtures—Standard Sanitary Mfg. Co.
PLUMBING: Soil—extra heavy cast iron.
HEATING: Steam. Boiler—Quiet May, May Oil Burner Co. Radiators—convector and Arco, American Radiator Co. Regulator—Minneapolis-Honeywell Regulator Co.

39. HOUSE FOR DONALD McDONALD, LA DUE, MO.

Alexander Piaget Photos

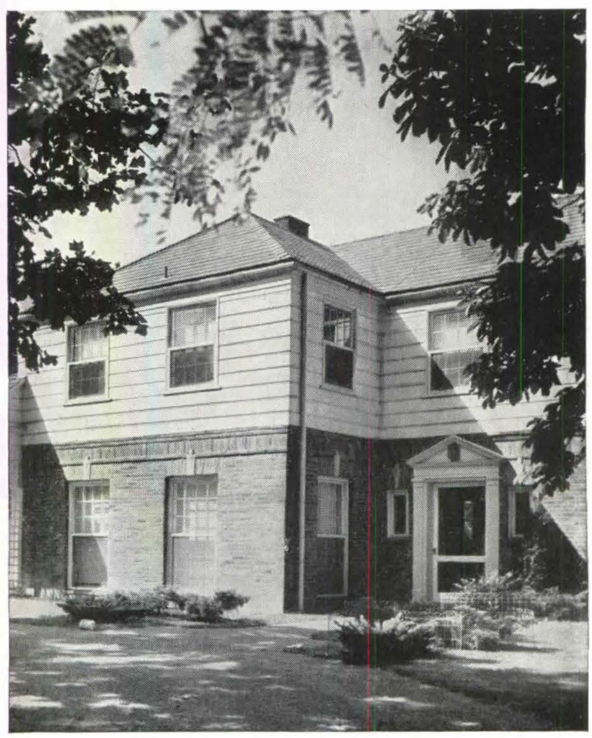
PROBLEM: To build a house within the foundations of a former house destroyed by fire. Budget: **$16,000.**

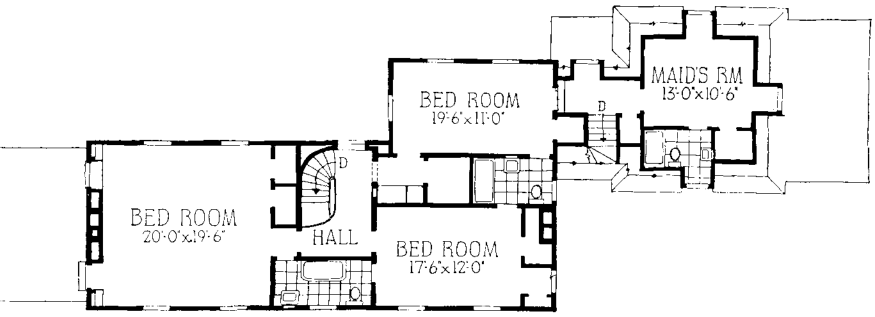
A design which uses traditional motives with great freshness. It might be noted that the house looks better, if anything, without the shutters generally considered indispensable.

The architect comments: "Some years ago a large house occupying the only building site on the property burned down. The foundations were too badly damaged to be reused, and as their removal would have been impossible within the budget, they were cut down to a point too low to interfere with possible planting, and, in many places were used as outside forms for the new foundations.

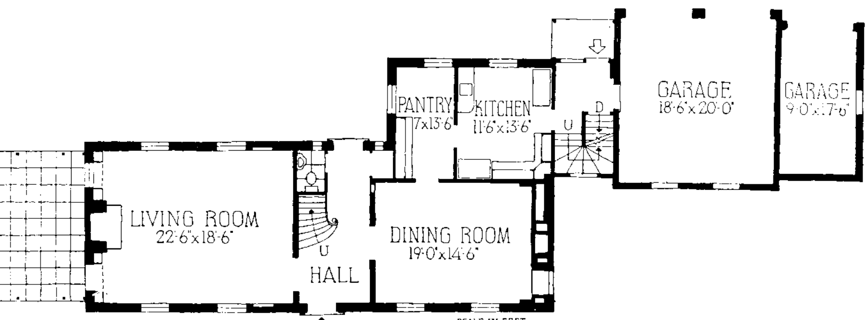
"It might interest those who firmly believe that a house always runs into more money than was originally intended, to know that the complete cost of construction, including plans, was $16,000."

Cubage: 51,785, at 31 cents a cubic foot.





SECOND FLOOR



FIRST FLOOR

LIVING ROOM

CONSTRUCTION OUTLINE

FOUNDATION
Walls—concrete, continuous. Cellar floor—concrete, reenforced with wire mesh and cinder fill.

STRUCTURE
Exterior walls—4 in. brick, 8 in. tile, siding, building paper, sheathing, rock wool and plaster. Floor construction—yellow pine joists and sub-floor.

ROOF
Yellow pine rafters, sheathing, 30 lb. felt, covered with asbestos shingles. Deck construction—joists, sheathing, covered with impregnated canvas.

CHIMNEY
Lining—fire clay. Damper—H. W. Covert Co.

SHEET METAL WORK
Flashing and leaders—copper. Gutters—copper lined.

INSULATION
Outside walls and attic floor—4 in. rock wool. Weatherstripping—lock strip type, alloy and bronze.

WINDOWS
Sash—double hung, heart cypress with white oak muntins. Glass—double strength, quality A. Screens—bronze in cypress frames, half sliding.

STAIRS
Treads—oak. Risers—poplar. Stringers—yellow pine.

FLOORS
Main rooms—select red oak, end matched. Kitchen—yellow pine, covered with linoleum, special. Bathrooms—4 x 4 in. vitreous tile.

WALL COVERINGS
Bedrooms and halls—wallpaper. Bathrooms—vitreous tile.

WOODWORK
Trim, shelving and cabinets—sap poplar. Interior doors—stock pine. Exterior doors—heart cypress.

HARDWARE
Interior and exterior—solid brass.

PAINTING
Interior walls and ceilings—3 coats, semi-gloss, stippled, starched. Floors—2 coats stain, waxed and polished. Trim and sash—4 coats enamel, rubbed. Exterior—Walls and sash—3 coats Titanium oxide, Titanium Pigment Corp.

ELECTRICAL INSTALLATION
Wiring system—in rigid and armored cable. Switches—tumbler type.

PLUMBING
Pipes: Soil, waste and vent—cast iron. Water supply—wrought iron.

HEATING AND AIR CONDITIONING
Forced air with filtering and humidifying, arranged for future cooling; gas fuel. Regulator—clock type, electric. Hot water heater—gas automatic with separate insulated tank.

40. HOUSE IN DETROIT BUILDERS' SHOW, DETROIT, MICH.

Elmer L. Astleford Photos

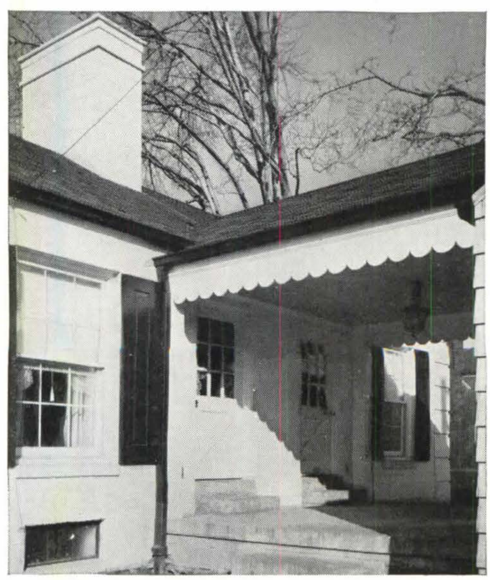
D. ALLEN WRIGHT, ARCHITECT

FLOOR PLAN

PROBLEM: To build a demonstration house.

The problem of a demonstration house is not only one of designing an attractive, well-planned house for normal living, but of planning to take care of large numbers of visitors. Circulation, therefore, becomes extremely important. Here a steady flow of traffic has been provided for. About 100,000 visitors went through the house in five weeks.
Cubage: 37,000 cubic feet. Cost: $14,800 at 40 cents a cubic foot.

BASEMENT



CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—4 in. concrete blocks, Concrete Products Assoc., building paper, sheathing, rock wool, rock lath and plaster. Floor construction—concrete joists, block and pattern wood floors set in mastic.
ROOF: Covered with red cedar shingles.
SHEET METAL WORK: Flashing, gutters and leaders—galvanized Armco iron, American Rolling Mill Co.
WINDOWS: Fenestra steel casements, Detroit Steel Products Co., and N.S.W. double hung unit, N.S.W. Co. Glass—double strength, quality A, Libbey-Owens-Ford Glass Co.
FLOORS: Living and dining rooms—painted concrete. Bedrooms and halls—oak in block and pattern, E. L. Bruce Co. Kitchen and bathrooms—linoleum. Recreation room—asphalt tile over concrete, Tile-Tex Co.
HARDWARE: Lockwood Hardware Mfg. Co.
ELECTRICAL INSTALLATION: Wiring system—C.N.X. concentric wiring, bare neutral. Switches—Despart, Pass & Seymour and Square-D circuit breakers, Square-D Co. Fixtures—special indirect, Detroit Edison Co.
KITCHEN EQUIPMENT: All equipment by General Electric Co.
LAUNDRY EQUIPMENT: Sink — Briggs Manufacturing Co. Washing machine—General Electric Co.
BATHROOM EQUIPMENT: All fixtures by Briggs Manufacturing Co.
HEATING AND AIR CONDITIONING
Warm air, fired by oil burner and filtered, Domestic Air Conditioning Co. Compressors and coils for cooling, Westinghouse Electric & Manufacturing Co. Thermostat—Julian P. Friez & Son. Hot water heater—Hot Point, Edison General Electric Appliance Corp.

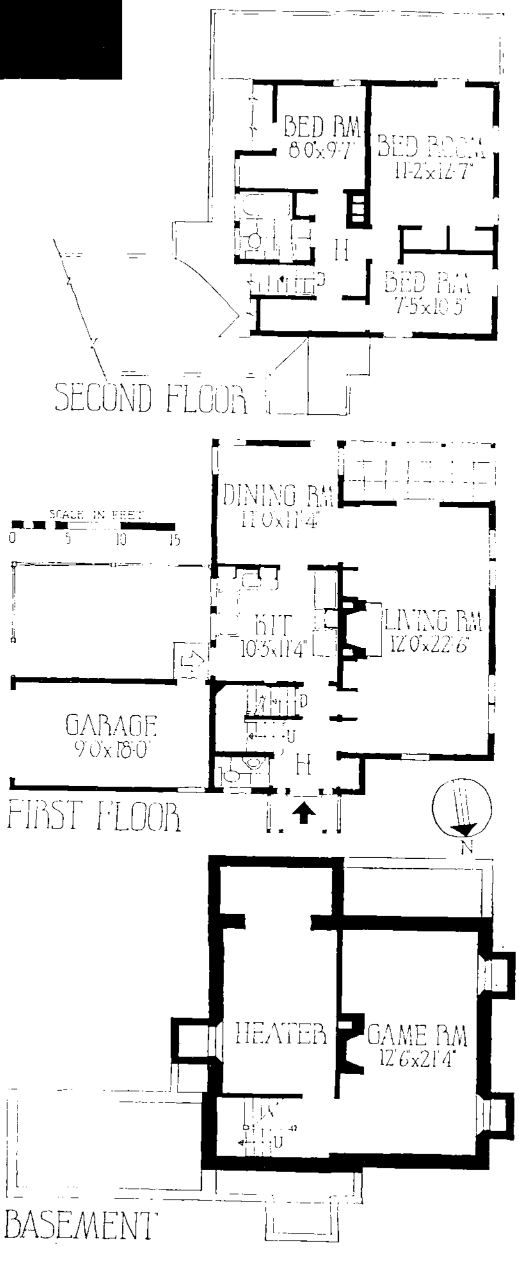
41. HOUSE FOR JOHN THERIAULT, CHESHIRE, CONN.

MAXWELL MOORE, ARCHITECT

PROBLEM: To build a house for sale. Colonial stipulated by the developer.

The architect comments: "This house has suggested some improvements to be carried out in those under construction or planned. We shall continue to develop the successful features such as the covered porch and open deck on the south side, the flexible living room-dining room communication, the general orientation of rooms, and room sizes on the first floor. The basement recreation room does not seem to be worth the effort. In the later house we are planning larger second floor rooms, garage with direct entrance to the house and unfinished bedroom above; and, where possible, separate laundry, a two-door kitchen, and a multi-purpose bedroom in conjunction with the first floor lavatory."

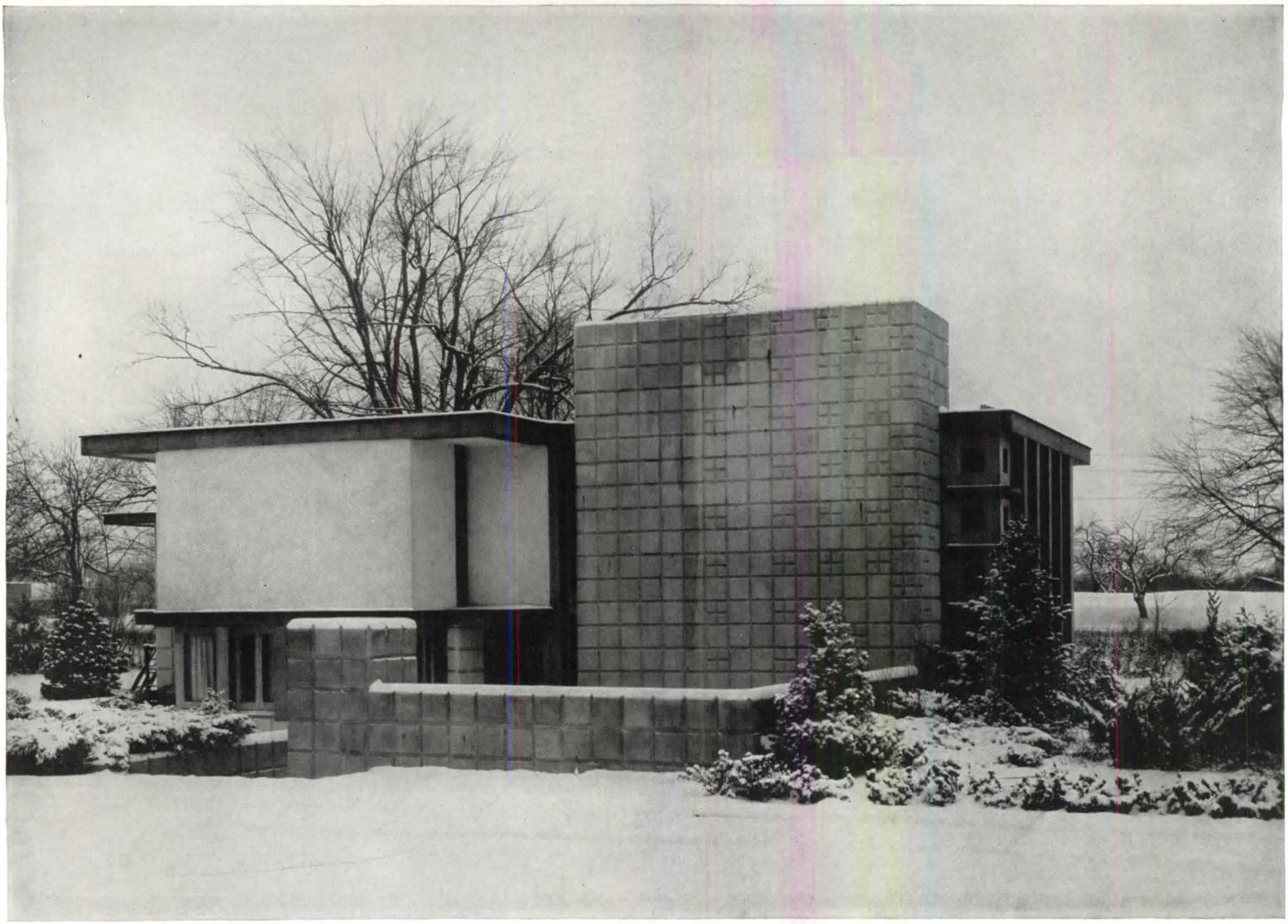
Cubage: 21,500. Cost: $7,650 at 36 cents a cubic foot.



CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—red cedar clapboards, Celotex sheathing, studs, Celotex plaster lath, The Celotex Co., and ½ hard wall plaster.
ROOF: Construction—fir rafters, covered with No. 1 Perfection red cedar shingles. Deck—fir floor and 12 oz. canvas in white lead.
CHIMNEY: Terra cotta lining. Damper—H. W. Covert Co.
SHEET METAL WORK: Flashing and leaders—copper. Gutters—stock fir.
WINDOWS: Double hung, Silentite, Curtis Companies, Inc. Glass—single strength, quality B, Pennvernon, Pittsburgh Plate Glass Co. Screens—fixed, copper.
FLOORS: Main rooms—red oak. Kitchen and bathrooms—fir covered with linoleum.
WALL COVERINGS: Living room—one wall knotty pine; remainder wallpaper, Imperial Paper & Color Corp. Bathrooms—asbestos tile board, Johns-Manville, Inc.
WOODWORK: All woodwork stock, Curtis Companies, Inc., except living room, special.
HARDWARE: All by Stanley Manufacturing Co. and Russell & Erwin Manufacturing Co.
ELECTRICAL INSTALLATION: Wiring system—BX. Switches—tumbler, Harvey Hubbell, Inc. Fixtures—indirect, flush, Chase Brass & Copper Co.
KITCHEN EQUIPMENT: Stove and refrigerator—Westinghouse Electric Mfg. Co. Sink—Standard Sanitary Mfg. Co.
BATHROOM EQUIPMENT: Lavatory—Standard Sanitary Mfg. Co. Tub—Briggs Manufacturing Co. Toilet—T/N, W. D. Case & Son.
PLUMBING: Pipes: Soil and waste—extra heavy cast iron. Water supply—copper tubing, Chase Brass & Copper Co.
HEATING: One pipe vapor, oil burner and Arco radiators and valves, American Radiator Co. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—Taco, built-in, Taco Heaters, Inc.

42. HOUSE FOR ALDEN W. HANSON, MIDLAND, MICH.



Wright

SECOND FLOOR

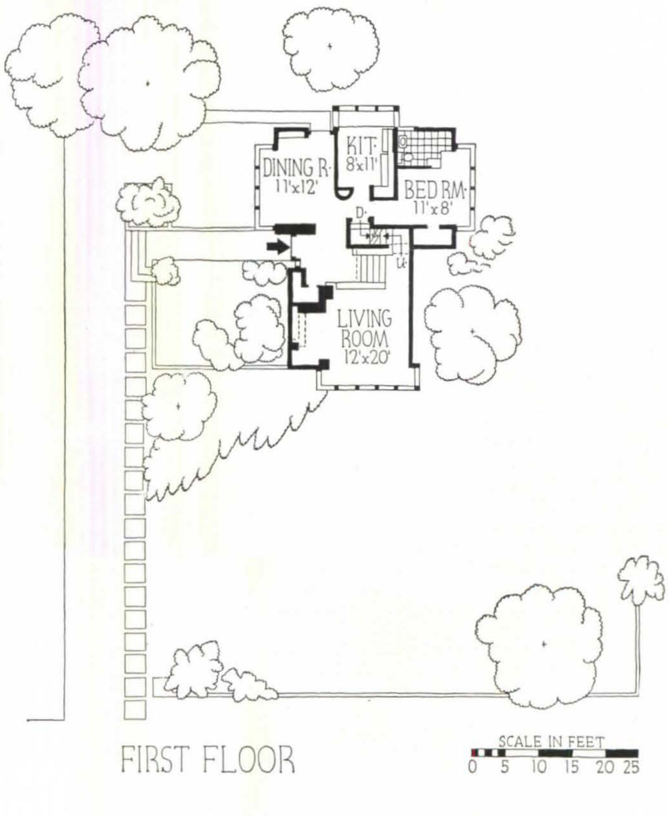
PROBLEM: To design an immediately required minimum number of rooms, with provision for future expansion.

While the multiplicity of materials and rather exaggerated use of Frank Lloyd Wright mannerisms makes for restlessness, the outstanding merit of this house is its design as a three-dimensional object, in contrast to the average small house which is designed as a series of elevations.

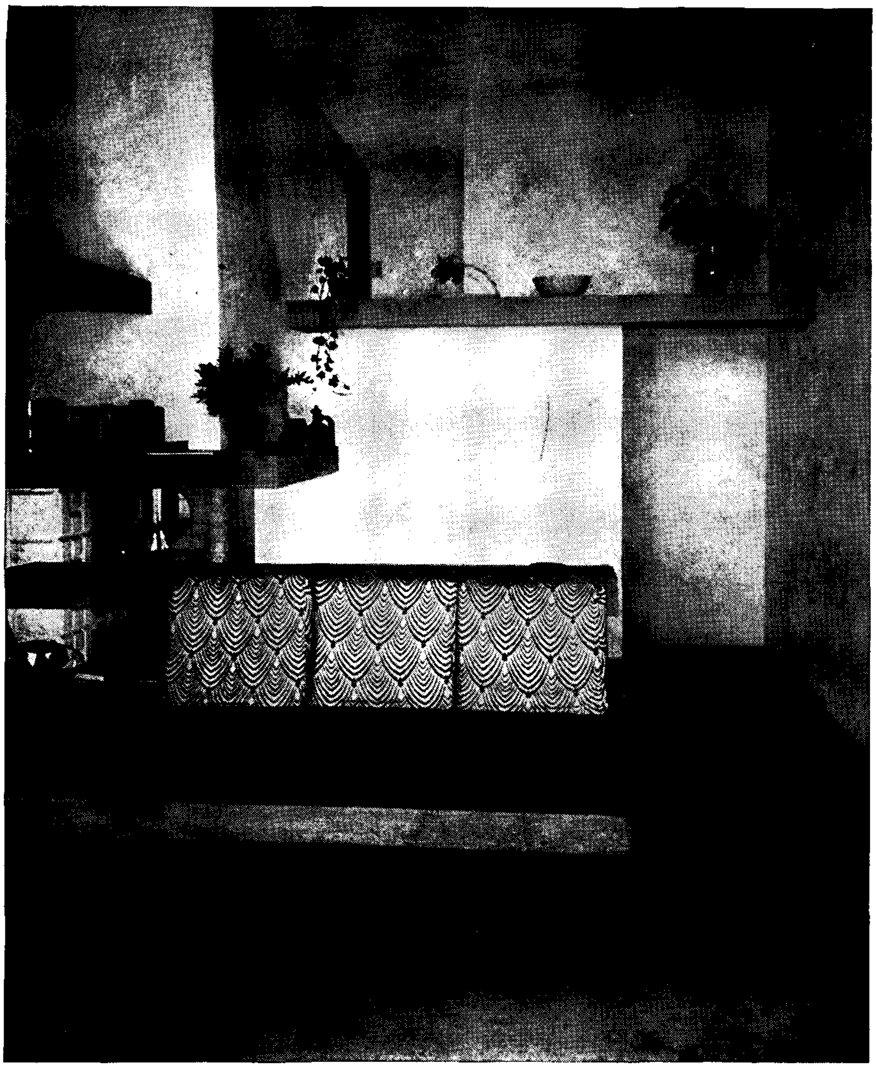
The architect comments: "The plan provides low cubage for kitchen, dining room, and lower bedroom which are located below grade and rest on the earth. This arrangement is economical, makes for cooler rooms in summer, and provides an interesting view of the planting outside.

"The combination of the toilet room with the maid's room has proven satisfactory, and is, of course, economical. The present service entrance is a temporary arrangement which considers the future plan."

Cubage: 17,811. Cost: $7,658.73 at 43 cents a cubic foot.



FIRST FLOOR

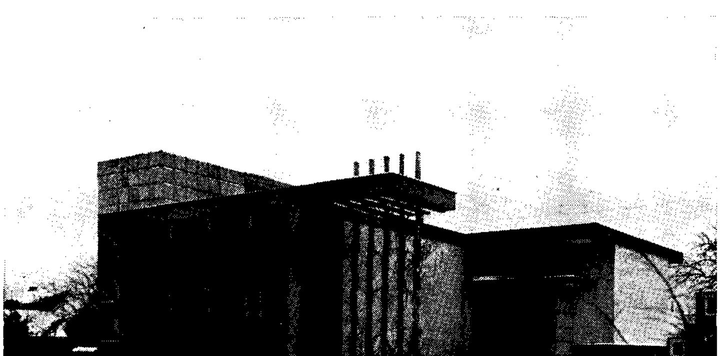


LIVING ROOM

Chickering

CONSTRUCTION OUTLINE

FOUNDATION
Walls—concrete block. Floor construction—concrete.
STRUCTURE
Exterior walls—block made of special design of cinder concrete developed by the architect and used as structural and finish wall. Waterproofing—exterior of blocks treated with waterproofing compound, Western Waterproofing Co.
ROOF
Construction—4-ply tar and gravel laid over ⅞ in. matched lumber.
CHIMNEY
Unit cinder block construction with terra cotta flue lining.
SHEET METAL WORK
Copper flashing, 16 oz., throughout.
WINDOWS
Wood sash of edge grain fir.
WOODWORK
Trim, cabinets and all finish wood—edge grain fir.
HARDWARE
Polished brass throughout, Schlage Lock Co.
PAINTING
Interior: Walls—sand-float finish plaster left natural. Woodwork—1 coat of linseed oil and 1 coat of flat white rubbed down to show grain. Exterior: Woodwork—stained blue-green.
ELECTRICAL INSTALLATION
All interior lighting recessed in ceiling or indirect from decks.
KITCHEN AND BATHROOM EQUIPMENT
All fixtures by Kohler Co.
PLUMBING
Pipes: Soil—cast iron. Water supply—copper tubing.
HEATING AND AIR CONDITIONING
Conditioned air, direct fired furnace, Dail Sheet Products Co.

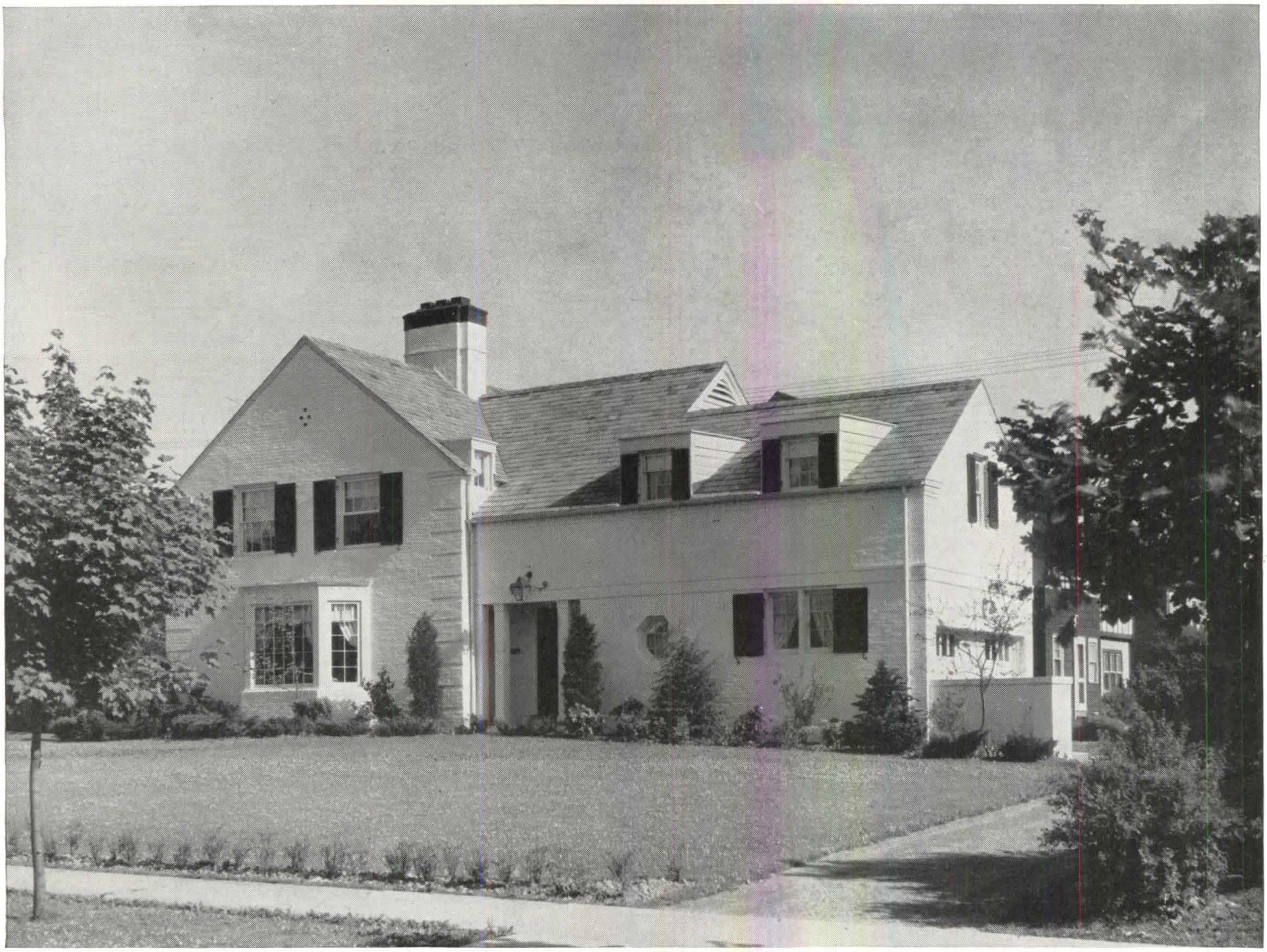


Wright

FIREPLACE-LIVING ROOM

Hanson

43. HOUSE FOR H. M. ROSENCRANS, SHAKER HEIGHTS, OHIO

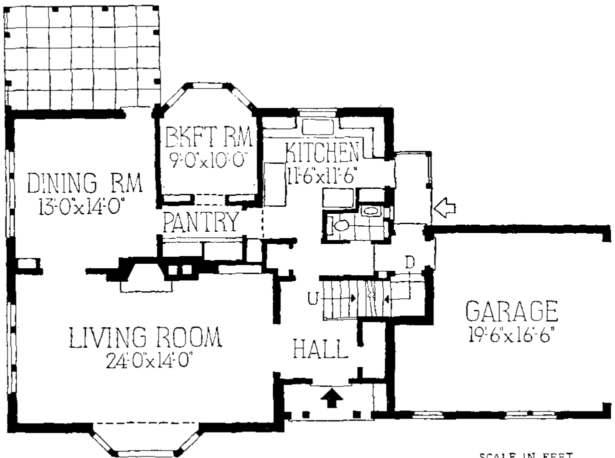


Carl F. Waite Photos

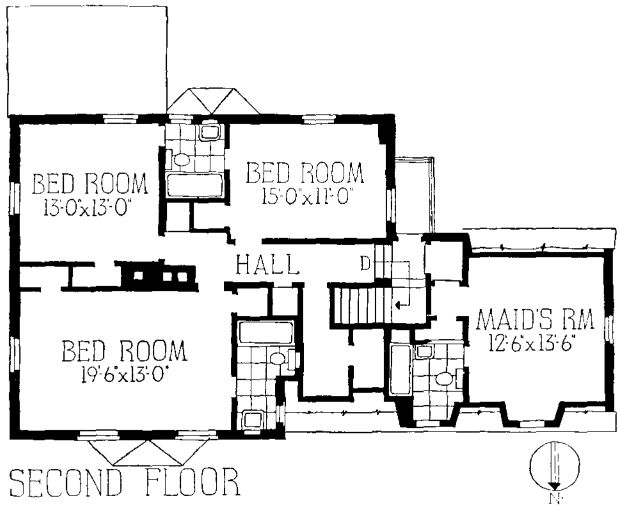
The agreeable texture of its whitewashed brick is an important factor in the attractive appearance of this Cleveland residence. One might question the octagonal window to the right of the entrance and the curtained window beyond: both open into the garage. A more frank solution here would not have detracted from the appearance of this house.

The architect comments: "This house occupies a corner lot and needed more study than the average house on an inside piece of property in order to obtain two interesting elevations.

"The garage and driveway were located to cut up the lot as little as possible. I feel that the circulation to garage, basement, kitchen, front hall is compact and direct. The morning room has bookcases at one end and serves as a small book room as well as a breakfast room." Cubage: 41,000. Cost: $13,000 at 32 cents a cubic foot.



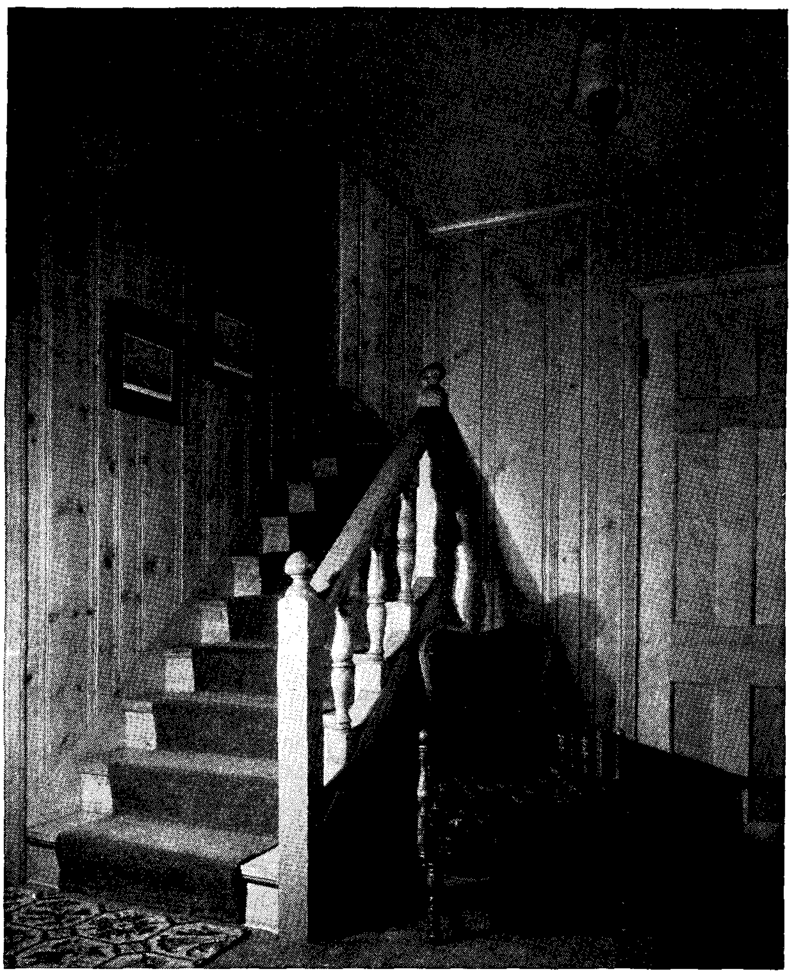
FIRST FLOOR



SECOND FLOOR

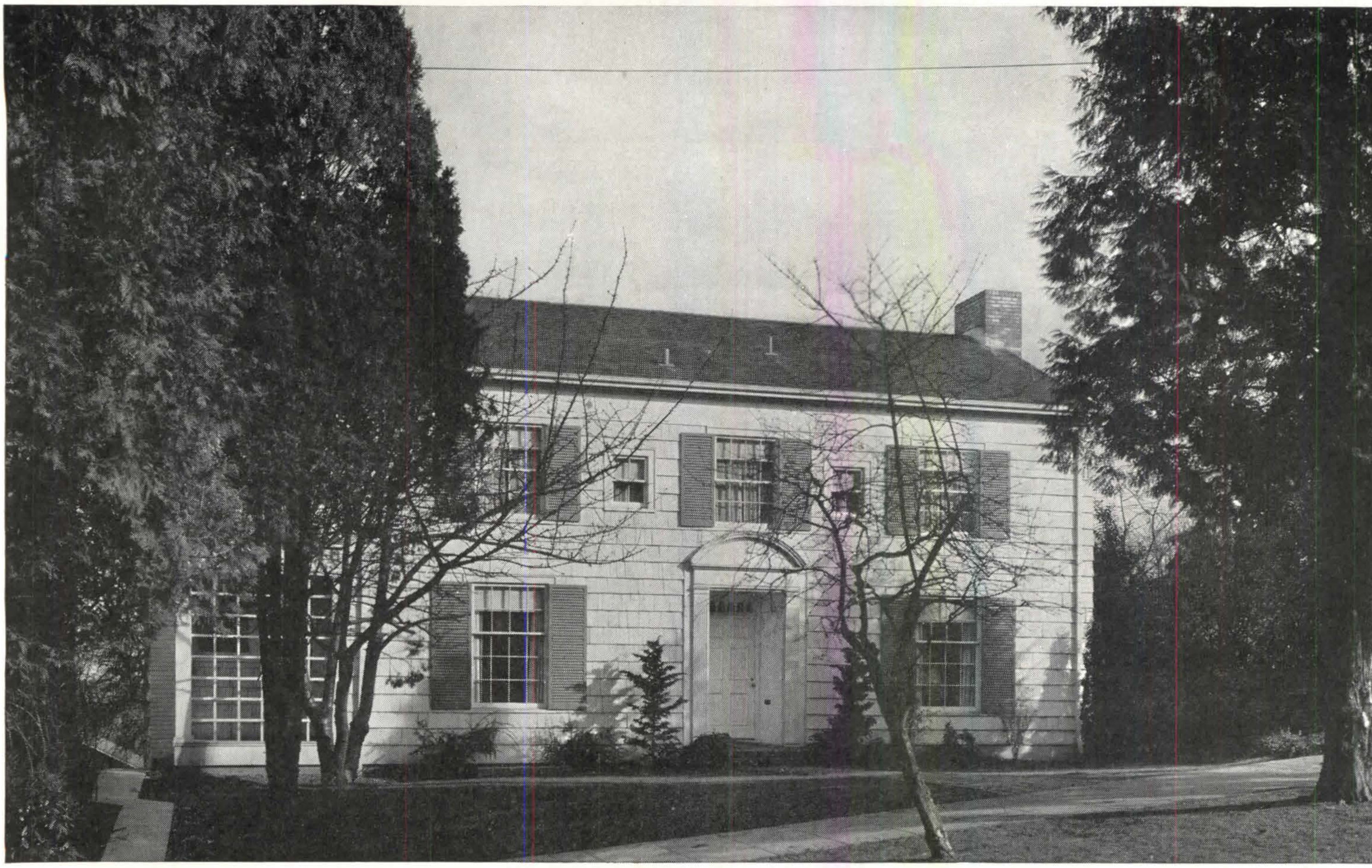
CONSTRUCTION OUTLINE

FOUNDATION
Walls—12 in. tile, continuous. Waterproofing—metallic, Master Builders Co.
STRUCTURE
Exterior walls—brick veneer, Sisalkraft paper, The Sisalkraft Co., sheathing, studs, rock wool and plaster. Floor construction—wood joists, sub-floor, 15 lb. paper and oak finish floor.
ROOF
Rafters, covered with sheathing, 30 lb. felt and reclaimed slate.
CHIMNEY
Flashing—zinc. Gutters and leaders—Toncan iron, Republic Steel Corp.
INSULATION
Outside walls—2 in. rock wool. Attic floor—4 in. rock wool. Weatherstripping—Monarch Metal Weatherstrip Co.
WINDOWS
Double hung, white pine. Glass—quality A, Libbey-Owens-Ford Glass Co. Screens—copper mesh in wood frames.
STAIRS
Treads—birch. Risers and stringers—knotty white pine. Attic stair—Bessler Disappearing Stairway Co.
FLOORS
Main rooms—oak. Kitchen—linoleum covered pine, Armstrong Cork Products Co. Bathrooms—ceramic tile.
WALL COVERINGS
Main rooms—wallpaper. Front entrance—knotty white pine. Kitchen—Sanitas, Standard Textile Products Co. Bathrooms—glazed tile and Sanitas.
WOODWORK
Trim, shelving and cabinets—gum. Doors—white pine. Garage doors—spruce. Overhead Door Co.
HARDWARE
Dull bronze throughout.
PAINTING
Interior: Floors—2 coats Minwax, The Minwax Co. Exterior: Brick walls—2 coats cement paint, Medusa Portland Cement Co. All trim and sash—3 coats lead and oil.
ELECTRICAL INSTALLATION
Wiring system—knob and tube. Fixtures—Enterprise Electric Co.
PLUMBING
All fixtures by Standard Sanitary Manufacturing Co. Pipes: Soil and waste—galvanized iron. Water supply—copper.
HEATING AND AIR CONDITIONING
Winter air conditioning, filtering, humidifying; oil burner, Perfection Stove Co. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—Ruud Manufacturing Co.



STAIR DETAIL

44. HOUSE FOR H. HILL JONES, SEATTLE, WASH.

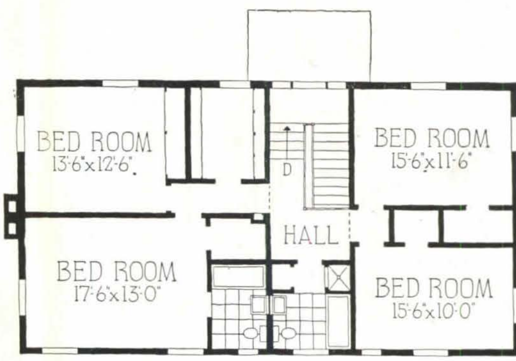


J. LISTER HOLMES, ARCHITECT

PROBLEM: To build a five-bedroom house on a very limited budget.

The simplicity of the solution had much to do with the architect's success in meeting the severe financial limitations imposed. The house is a simple rectangle, with all superfluous breaks and detail eliminated. The frequent inconsistency between the modern plan and a traditional shell is illustrated here by the small windows on the second floor, made as inconspicuous as possible to avoid interrupting the predetermined rhythm of the facade. The lattice on the side porch, recalling the division of the windows, gives interest and consistency to the design.

Cubage: 37,000. Cost: $7,800 at 21 cents a cubic foot.



SECOND FLOOR

CONSTRUCTION OUTLINE

FOUNDATION: Walls—concrete, continuous. Cellar floor—cement finish. Waterproofing—Pabco, asphalt, The Paraffine Companies, Inc., on outside basement walls.

STRUCTURE: Exterior walls—hand split shakes, building paper, sheathing, studs, wood lath and plaster.

ROOF: Covered with shingles.

CHIMNEY: Brick, Seattle Brick & Tile Co. Damper—Majestic Co.

SHEET METAL WORK: Flashing, gutters and leaders—Armco iron, American Rolling Mills Co.

WINDOWS: Sash—double hung, fir. Glass—double strength, quality B, Libbey-Owens-Ford Glass Co.

STAIRS: Treads—oak. Risers and handrail—fir.

FLOORS: Main rooms—oak. Kitchen and bathrooms—linoleum, Armstrong Cork Products Co.

WALL COVERINGS: Main rooms—wallpaper.

WOODWORK: Fir throughout.

HARDWARE: All by Yale & Towne Mfg. Co.

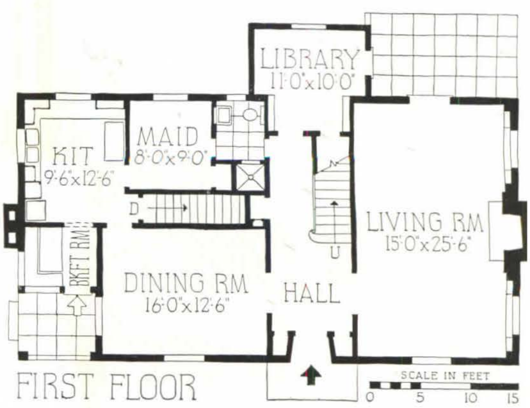
PAINTING: Interior: Walls and ceiling—paint. Floors—oil. Trim—Ripolin, The Glidden Co. Exterior: Walls—Double White, Samuel Cabot, Inc. Sash—lead and oil.

ELECTRICAL INSTALLATION: Wiring system—knob and tube. Switches—Harvey Hubbell, Inc. Fixtures—direct and indirect, Chase Brass & Copper Co.

KITCHEN EQUIPMENT: Stove—Westinghouse Electric & Manufacturing Co.

PLUMBING: All fixtures by Standard Sanitary Manufacturing Co. Pipes: Soil, waste and vent—cast iron. Water supply—medium steel.

HEATING AND AIR CONDITIONING: Forced air, filtered. Oil burner—Pacific, W. W. Rosenbraugh Co. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—electric.

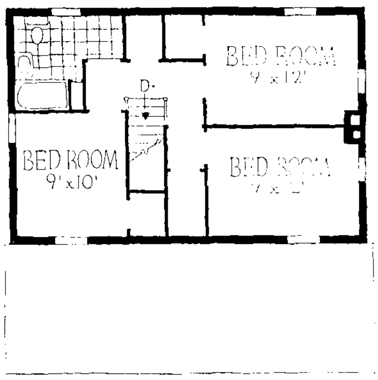


FIRST FLOOR

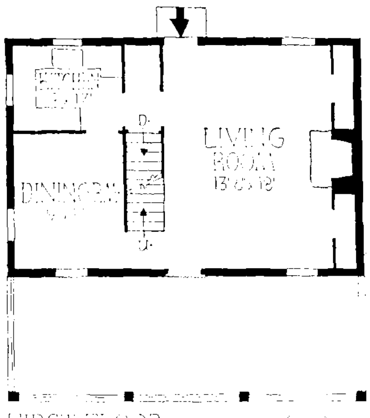
45. HOUSE FOR MRS. S. V. BROWN, WILLIAMSPORT, PENNA.

MALCOLM A. CLINGER, ARCHITECT

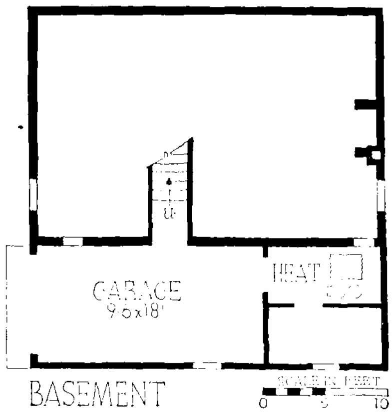
Donald Ross



SECOND FLOOR



FIRST FLOOR



BASEMENT

This house is one of a number on an old farm no longer used for agriculture, built to provide the revenue needed to meet increased taxes.

The architect comments: "To carry out the note struck by existing old structures rooms are generally small, yet an attempt was made to provide a feeling of space in the first floor arrangement.

"It was also the purpose to utilize the contours, to make no fantastic designs, but to build a quiet colony which would appear to be a natural group, fitting well into the landscape."

Cubage: 18,000. Cost: $4,888 at 27 cents a cubic foot.

CONSTRUCTION OUTLINE

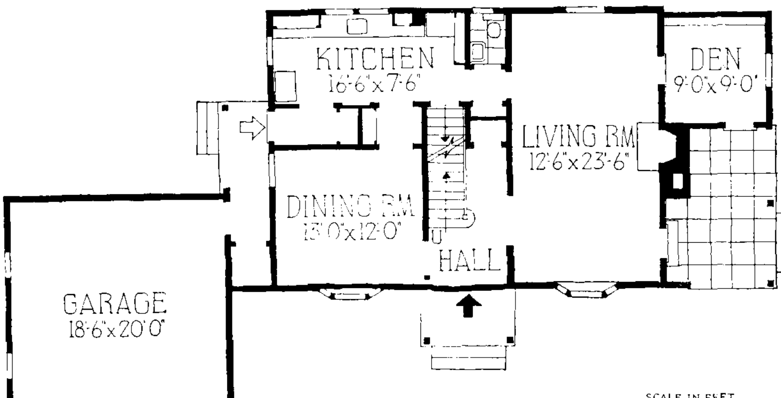
STRUCTURE: Exterior walls—cinder blocks and Insulite, The Insulite Co. Interior partitions—double thick knotty white pine.
ROOF: Covered with cedar shingles.
CHIMNEY: Lining—terra cotta. Damper—H. W. Covert Co.
SHEET METAL WORK: Flashing—16 oz. copper. Gutters and leaders—Armco, American Rolling Mills Co.
WINDOWS: Sash—double hung and casements, wood. Glass single strength, quality A.
STAIRS: Treads—yellow pine.. Risers and stringers—knotty white pine.
FLOORS: Main rooms—yellow pine. Kitchen and bathrooms—linoleum, Armstrong Cork Products Co.
HARDWARE: Interior and exterior—McKinney Manufacturing Co.
PAINTING: Interior: Main rooms, floors and trim—Minwax Co. Bathrooms and kitchen—enamel, Sherwin-Williams Co. Exterior: Walls—cement paint; sash—oil paint, both by Sherwin-Williams Co.
ELECTRICAL INSTALLATION: Wiring system—BX. Switches—Hart & Hegeman. Fixtures—Chase Brass & Copper Co.
KITCHEN EQUIPMENT: Stove and refrigerator—General Electric Co. Sink—Standard Sanitary Manufacturing Co.
BATHROOM EQUIPMENT: Lavatory and tub—Standard Sanitary Manufacturing Co. Seat—C. F. Church Manufacturing Co. Shower—Speakman Co.
PLUMBING: Pipes: Soil and waste—extra heavy cast iron. Water supply—copper tubing, Chase Brass & Copper Co.
HEATING: Hot water system, cold fired boiler—Peerless Manufacturing Corp.

46. HOUSE FOR DR. M. F. CERASOLI, BARRE, VERMONT

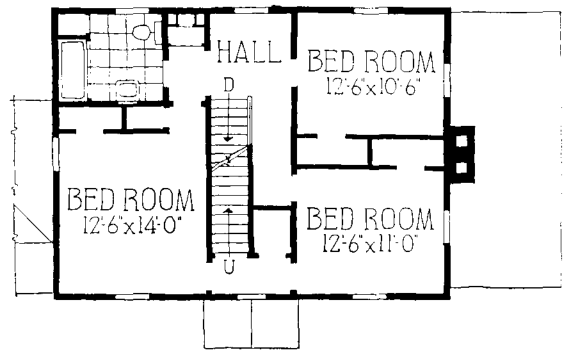
Not all small houses can show as good a rear elevation as the one above. The straightforward handling of the few elements is admirable. The change to flush siding on the lower floor and the omission of shutters minimizes the varying sizes of windows, the general regularity of the design being emphasized by the three windows with black shutters on the second floor.

The architect comments: "The client preferred a central hall scheme. The lot had 100 feet frontage, but only 60 feet of depth. Consequently the house was placed well to the rear of the lot with the garage projecting forward. This provided a good lawn in the front with a play yard behind the garage, opening off the kitchen. An added feature is the direct connection between the master bedroom and the nursery."

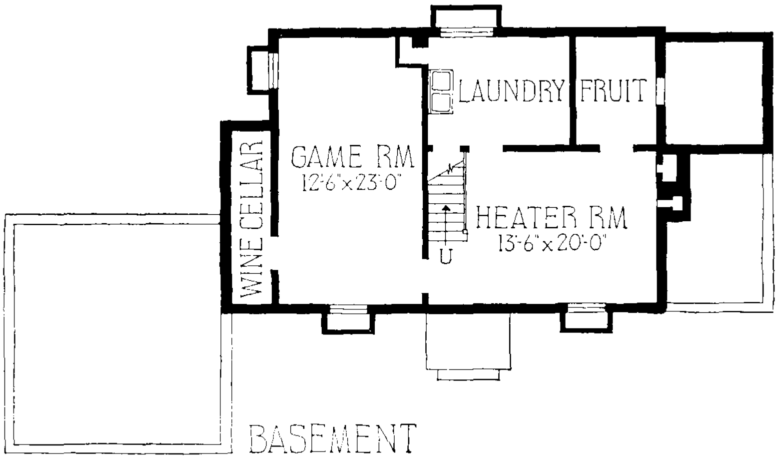
Cubage: 34,480. Cost: $8,929 at 26 cents a cubic foot.



FIRST FLOOR



SECOND FLOOR



BASEMENT

CONSTRUCTION OUTLINE

FOUNDATION
Walls—poured concrete, continuous. Cellar floor—3 in. concrete on gravel fill. Waterproofing—Adensite integral in foundation walls, Adensite Co.

STRUCTURE
Exterior walls—10 in. red cedar siding and random width matched flush boarding, 40 lb. resin paper, 8 in. sheathing, studs, No. 2 native spruce, rock lath and plaster, U. S. Gypsum Co. Floor construction—2 x 10 in. joists, 16 in. o.c., rough and finished floor. Ceiling—plaster hard finish.

ROOF
Construction—rafters, T. & G. roof boarding covered with 12 in. Flintkote thickbut strip asbestos shingle laid 5 in. to weather, The Flintkote Co.

CHIMNEY
Common brick, terra cotta flues. Damper—cast iron, rotary control, Donley Brothers Co.

SHEET METAL WORK
Flashing and gutters—16 oz. copper.

INSULATION
Outside walls—aluminum foil on U. S. Gypsum Co.'s rock lath. Attic floor—4 in. Red Top insulating wood, U. S. Gypsum Co. Weatherstripping—Chamberlin Metal Weatherstrip Co.

WINDOWS
Wood, double hung, Iroquois Millwork Corp. Glass—single thickness, Libbey-Owens-Ford Glass Co.

FLOORS
Living room, bedrooms and halls—red birch. Kitchen and bathrooms—linoleum covered pine, Armstrong Cork Products Co.

WALL COVERINGS
Main rooms—wallpaper, Imperial Paper & Color Corp. Kitchen and bathrooms—Linowal, Armstrong Cork Products Co.

WOODWORK
Trim, shelving and cabinets—white pine and Douglas fir. Doors—white pine.

HARDWARE
Interior and exterior—P. & F. Corbin.

PAINTING
Interior: Walls, trim and sash—enamel. Floors—varnish and Valspar, Valentine Co. Exterior: Walls and sash—Sherwin Williams Co.

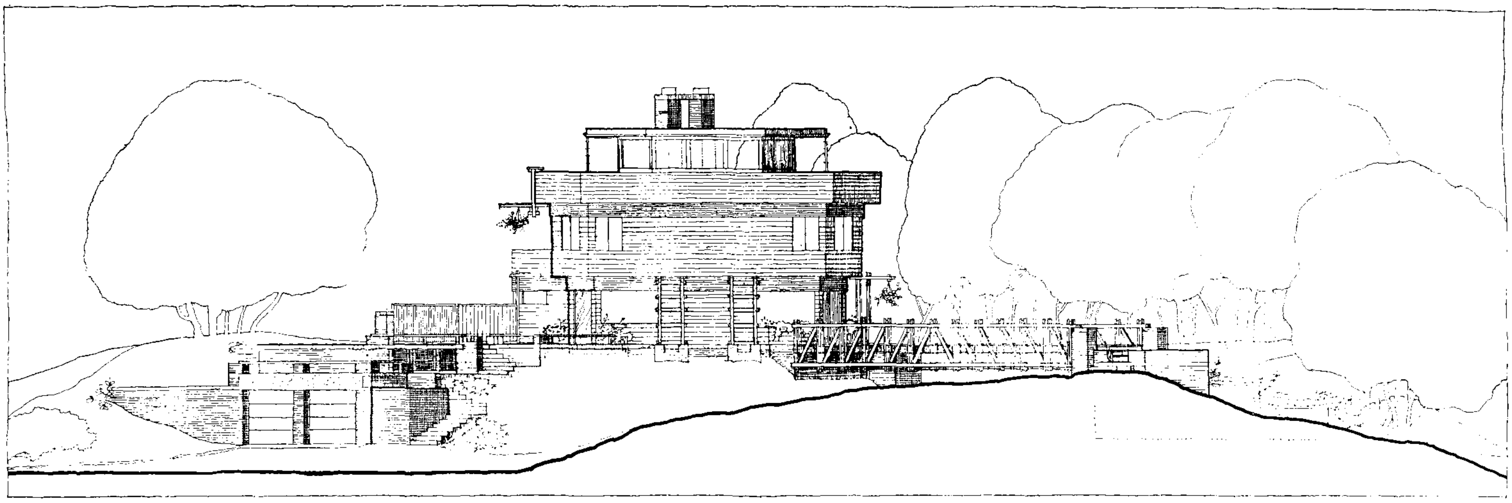
ELECTRICAL INSTALLATION
Wiring system—Romex non-metallic, Rome Wire & Cable Co. Switches—Hart & Hegeman. Fixtures—direct, Lightolier Co.

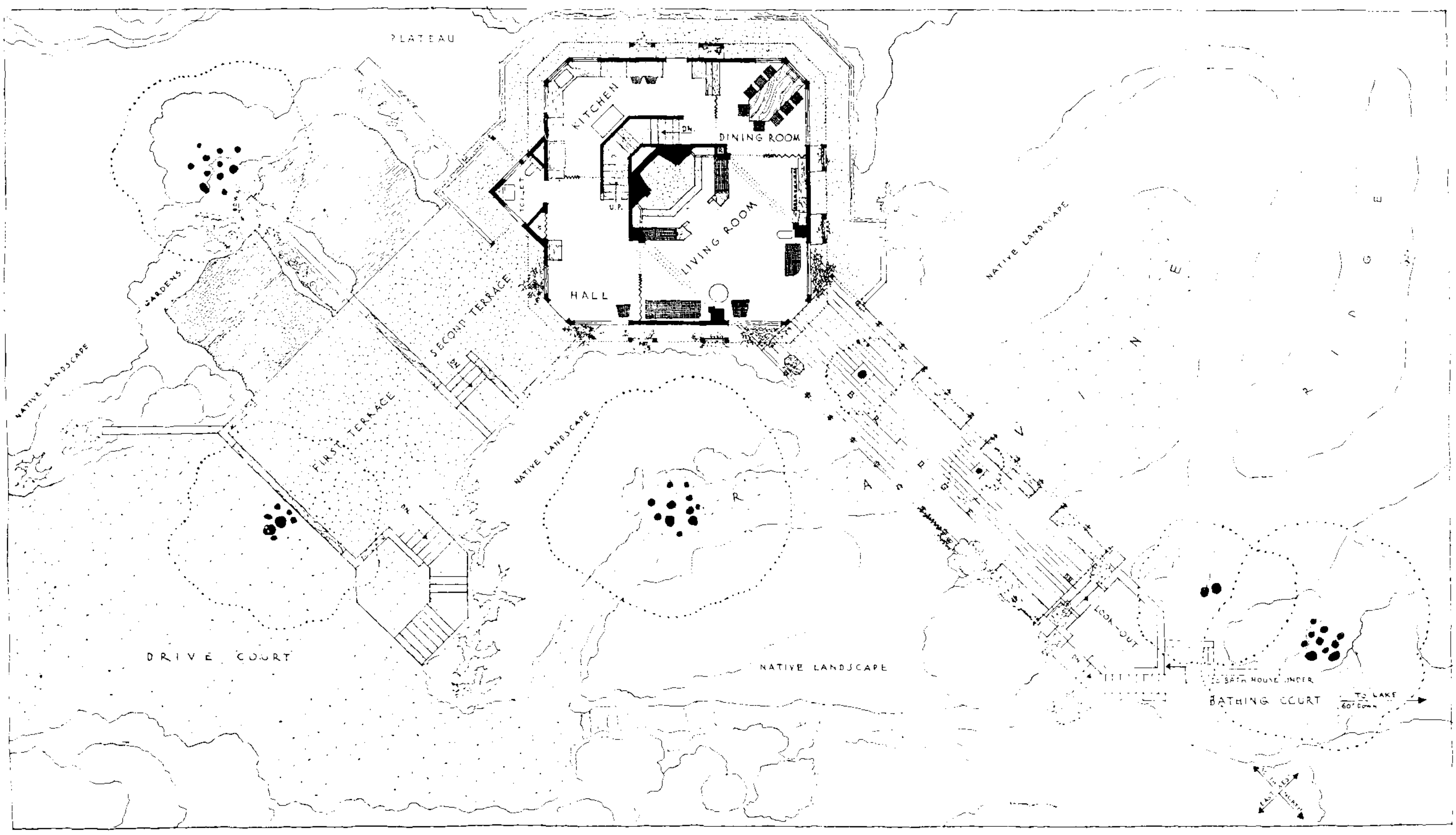
KITCHEN EQUIPMENT
Stove and refrigerator—Edison General Electric Appliance Corp.

PLUMBING
All fixtures by Standard Sanitary Manufacturing Co. Pipes: Soil and waste—hard copper, Chase Brass & Copper Co. Water supply—copper, Mueller Brass Co. (Streamline Pipes and Fittings Co.)

HEATING
Two pipe vapor system. Boiler—Thatcher Furnace Co. Radiators—Corto and Convector, American Radiator Co. Valves—Hoffman Specialty Co. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—Excelso indirect, Exelso Products Corp.

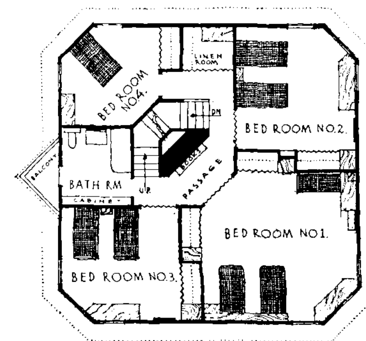
47. HOUSE IN WOOD, BIRCHWOOD BEACH, MICH.



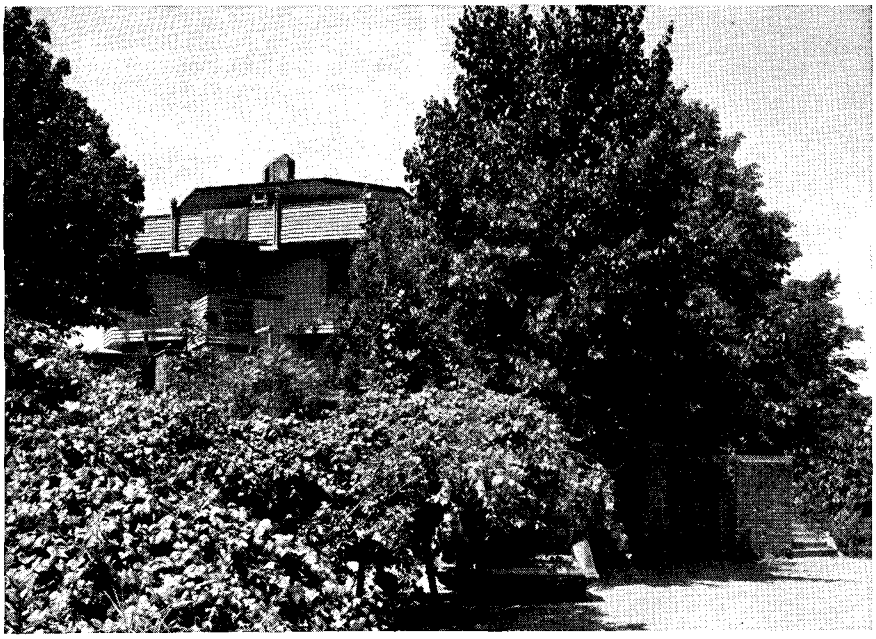


The problems presented by a highly irregular site have been met in a most unusual manner. Instead of the low, rambling type of structure commonly used on such terrain, the architect has concentrated the house in a compact, three-story square. In an equally unconventional manner the square has been subdivided. A stair and chimney make up the core, with the rooms occupying the entire perimeter. Tying the house in with its surroundings is accomplished by the terraces, the lower of which is the roof of the garage; on the axis at right angles to that of the terraces is a wooden bridge which spans the ravine, leading to bathing houses and the lake 60 ft. below. The generous width of the bridge also permits its further use as an outdoor living space. Examples of the built-in furniture, used extensively throughout the house, are shown on the following pages.

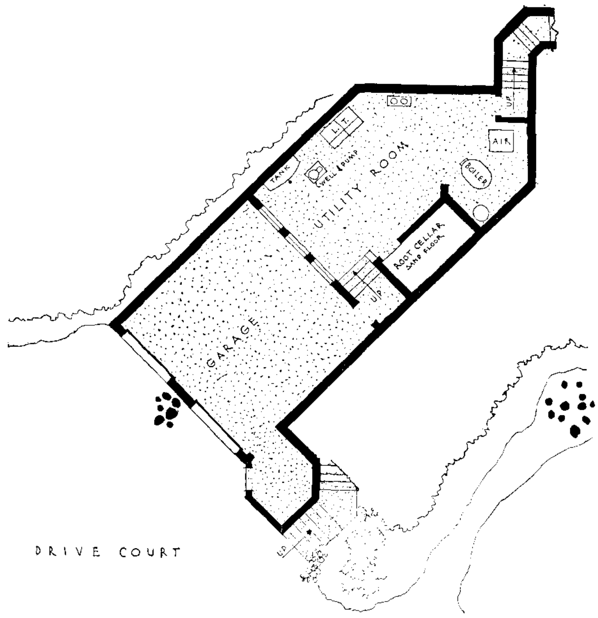
Cubage: 46,940. Cost: $16,034 at 34 cents a cubic foot.

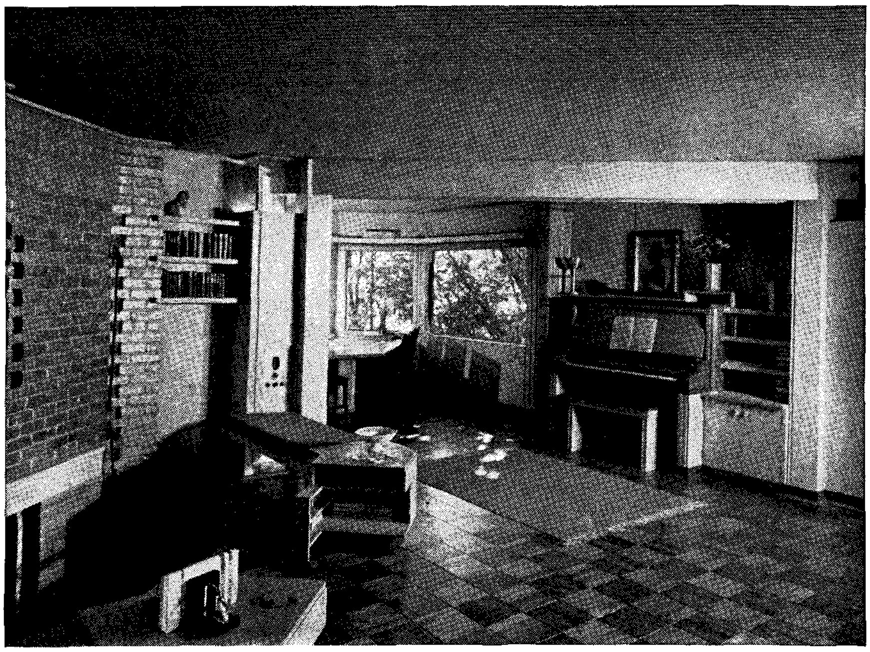


SECOND FLOOR

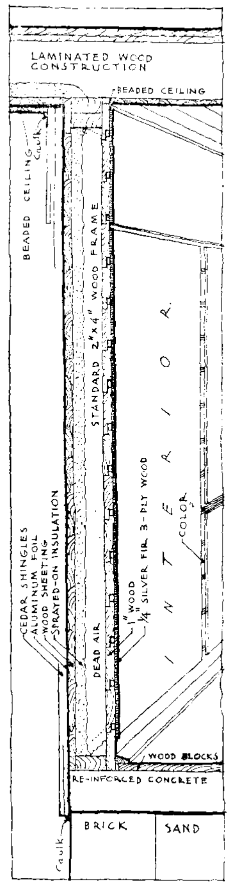


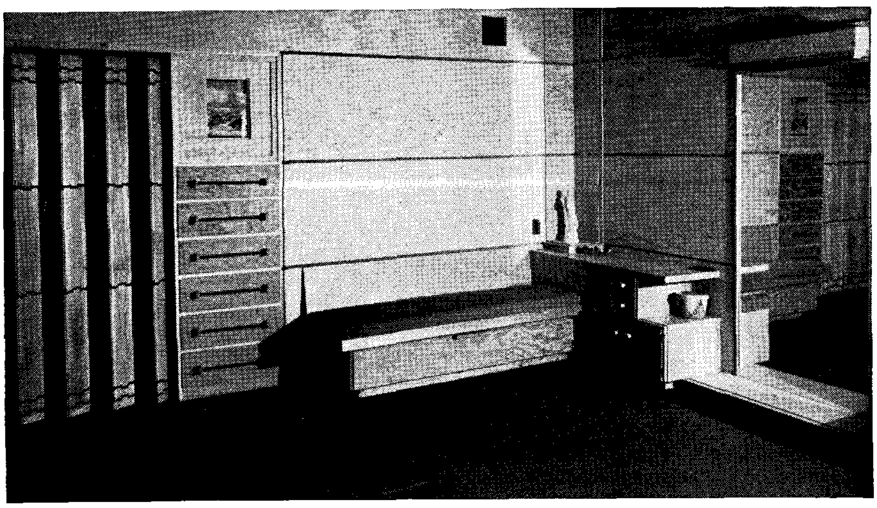
APPROACH



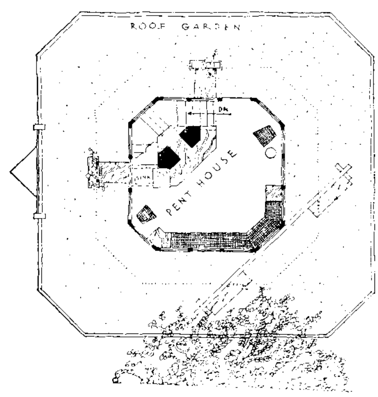


LIVING-DINING ROOM

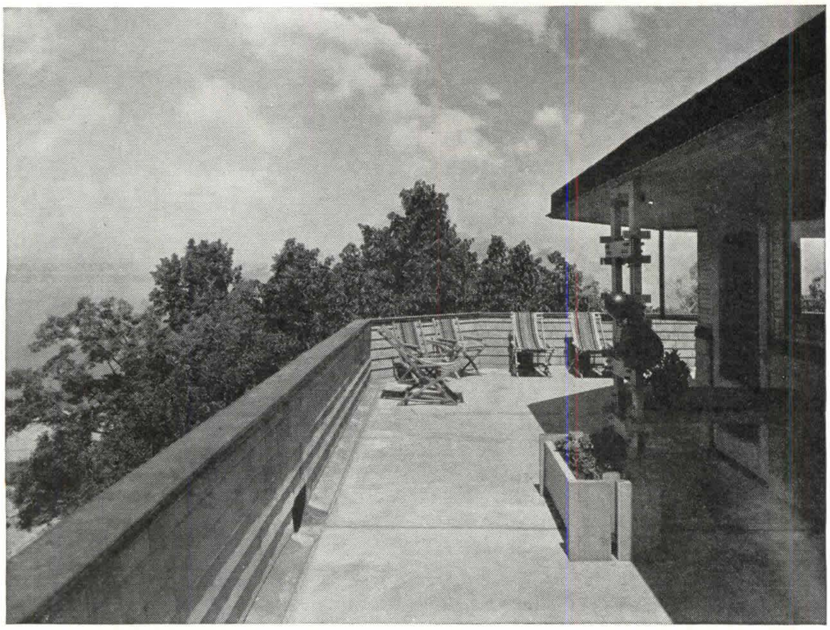




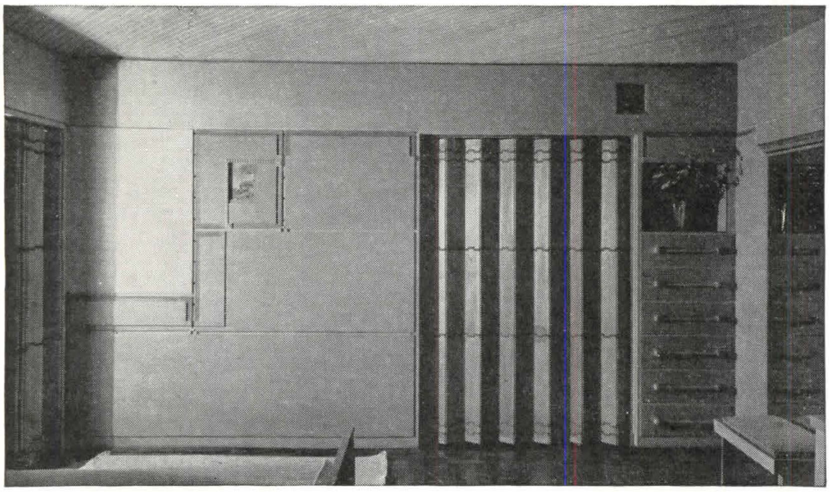
OWNER'S BEDROOM



HOUSE IN WOOD JOHN LLOYD WRIGHT, ARCHITECT



PENTHOUSE TERRACE



PLYWOOD WALL

CONSTRUCTION OUTLINE

FOUNDATION
Walls—brick and concrete, continuous. Waterproofing—asphalt.

STRUCTURE
Exterior walls—cedar shingles, sheathing, wood frame, insulation and ¼ in. Silver fir plywood. Floor construction—wood blocks on cement slab, E. L. Bruce Co. Ceilings—⅝ in. standard wood.

ROOF
Construction—built-up roofing and cement topping.

INSULATION
Outside walls and roof—Sprayo Co.'s Flake Seal and Reynolds Corp.'s aluminum Metallation. Weather-stripping—Chamberlin Metal Weatherstrip Co.

WINDOWS
Sash—steel casements and casement screens, Hope's Windows, Inc. Glass—double strength, Thermopane, Libbey-Owens-Ford Glass Co. Blinds—wood fabric, Aeroshade Co.

FLOORS
Wood block, E. L. Bruce Co.

WALL COVERINGS
All rooms—Silver fir plywood, open joint, decorative color treatment, Manuel Sandoval.

WOODWORK
Shelving and cabinets—plywood. Interior doors—special, wood pendent folding screens, Aeroshade Co. Exterior doors—wood slab. Garage doors—overhead, DeLuxe, Kinnear Co.

HARDWARE
Cylinder locks—Yale & Towne Manufacturing Co.

PAINTING
Interior: Walls and ceilings—special water color stains, compounded by Ramon Shiva, transparent lacquer, E. I. Du Pont de Nemours Corp. Floors—factory finish, E. L. Bruce Co. All sash—oil paint. Exterior walls—stained.

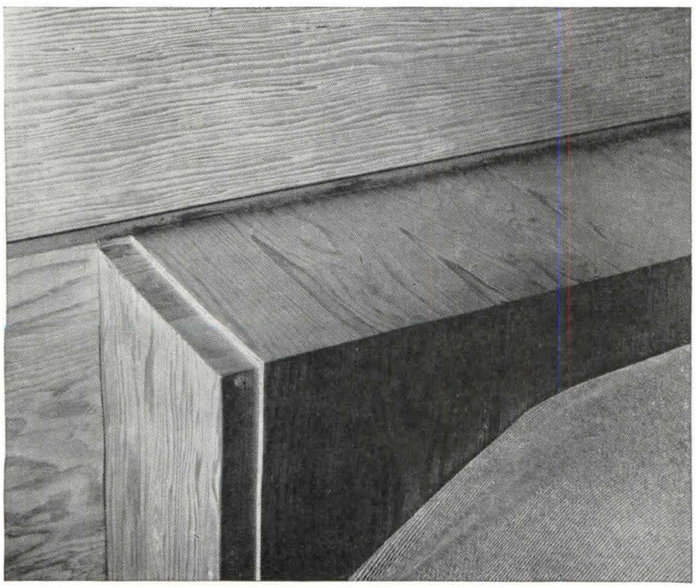
ELECTRICAL INSTALLATION
Wiring system—BX. Switches—standard, General Electric Co. Fixtures—built-in, indirect.

BATHROOM AND LAUNDRY EQUIPMENT
Seat—C. F. Church Manufacturing Co. All other fixtures by Standard Sanitary Manufacturing Co.

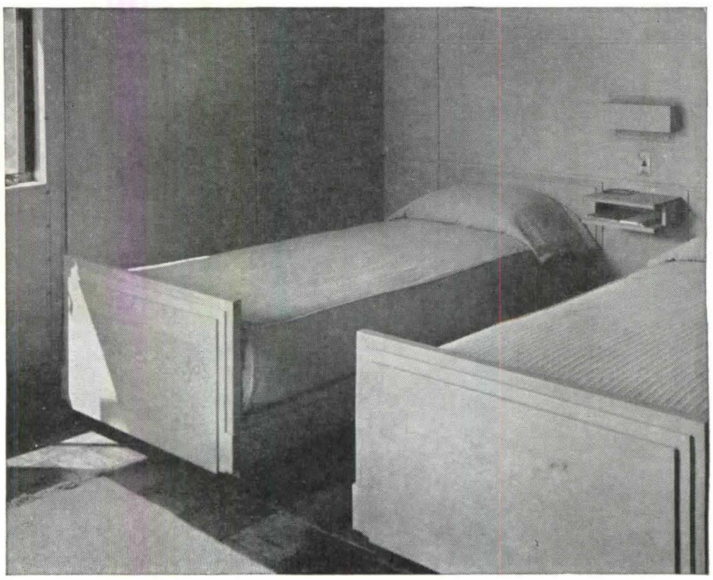
PLUMBING
Pipes: Soil and waste—iron. Water supply—Chase Brass & Copper Co.

HEATING AND AIR CONDITIONING
Forced air, filtering and humidifying system, oil burner and hot water boiler, General Electric Co. Regulator—Minneapolis-Honeywell Co.

PLYWOOD DETAIL



BUILT-IN BEDS



48. HOUSE FOR PAUL E. HARRISON, DOVER, N. H.

Currier

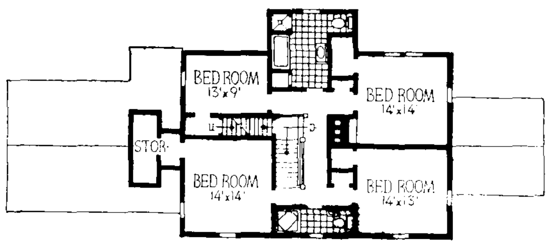
LUCIEN O. GEOFFRION, ARCHITECT

PROBLEM: The owner called for a comparatively inexpensive, yet generously appointed house with provisions for entertaining guests. A combined laboratory and playroom was required in the basement.

The architect comments: "The owners wished their house to appear as long and low as possible, yet to provide for full use of second floor space for maximum sized bedrooms. They also demanded auxiliary stairs to reduce wear on the main stairs, and to facilitate circulation from second floor to service portion. The owners also wished an effort to be made to integrate the living room, dining room, and sun porch with the large terrace.

"The pantry, in my opinion, is not needed and if it had been made into a breakfast room instead it would have allowed a better designed and more comfortable kitchen."

Cubage: 42,000. Cost: $11,000 at 26 cents a cubic foot.



SECOND FLOOR

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—red cedar shingles, building paper, pine sheathing, studs, Celotex lath, The Celotex Co., and plaster. Floor construction—hemlock, metal lath and plaster; Thermofill between joist, U. S. Gypsum Co.

ROOF: Covered with composition shingles, Johns-Manville Co.

SHEET METAL WORK: Flashing—copper. Gutters—Toncan metal, Republic Steel Corp.

INSULATION: Roof—4 in. Thermofill, U. S. Gypsum Co.

FLOORS: Main rooms—oak. Kitchen and bathrooms—linoleum covered fir, Congoleum-Nairn.

WALL COVERINGS: Bedrooms—wallpaper, Richard E. Thibaut, Inc.

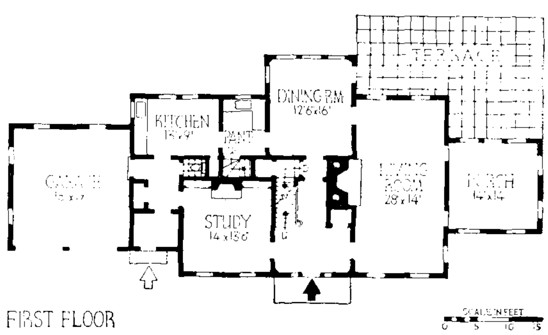
ELECTRICAL INSTALLATION: Wiring system—BX. Switches—Cutler Hammer Co. Fixtures—indirect, Chase Brass & Copper Co.

KITCHEN EQUIPMENT: Stove—General Electric Co. Sinks—Standard Sanitary Manufacturing Co. Cabinet—Morgan Woodworking Co. Washing machine and drier—Maytag Co.

BATHROOM EQUIPMENT: Seat—C. F. Church Manufacturing Co. Cabinet—Philip Carey Co. All other fixtures—Standard Sanitary Manufacturing Co.

PLUMBING: Pipes: Soil and waste—wrought iron, A. M. Byers Co. Water supply—copper and brass. Monel tank, sump pump, Penberthy Injector Co.

HEATING: Boiler and radiators—National Radiator Corp. Valves—Hoffman Specialty Co., Inc. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—Excello No. 6, Excelso Products Corp.



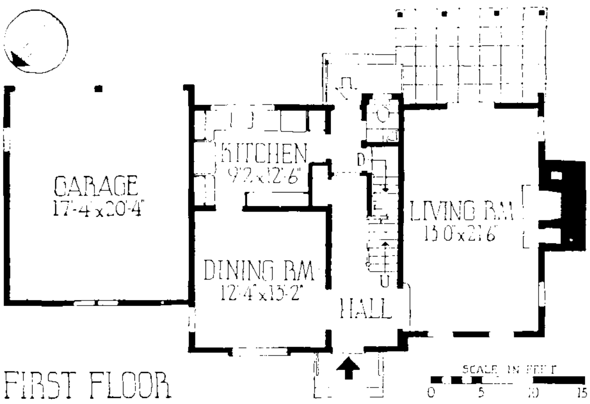
FIRST FLOOR

49. HOUSE IN WESTFIELD, NEW JERSEY

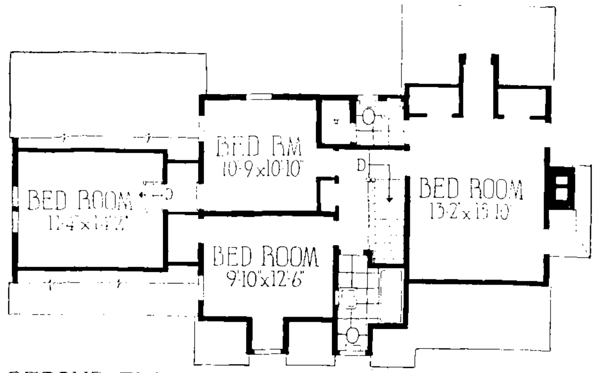
John Gass Photos

This house was designed as the first unit in a new development. The site adjoins a park. The house was placed on the summit of a small hill, and it was the contour of the land which dictated the placing of garage and living room on a lower level than the rest of the house. The house follows the conventional lines of small development houses, although it is better than many. A less varied window treatment, and a simpler handling of the masses might have produced a more composed result.

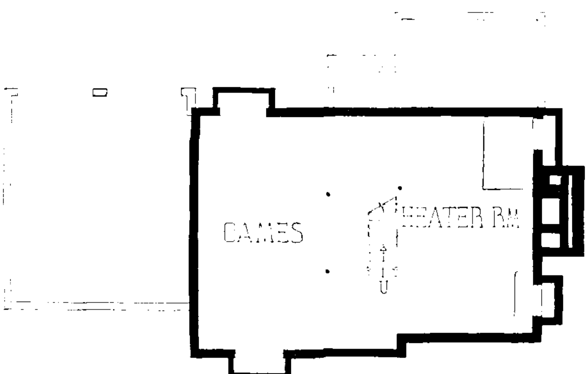
Cubage: 26,500. Cost: $9,700 at about 37 cents a cubic foot.



FIRST FLOOR



SECOND FLOOR



BASEMENT

HALL-LIVING ROOM

CONSTRUCTION OUTLINE

FOUNDATION
Walls—cinder block, concrete footings. Cellar floor—4 in. concrete over cinder fill. Waterproofing—Anit-Hydro in ½ in. stucco over exterior foundation, Anti-Hydro Waterproofing Co.

STRUCTURE
Exterior walls—red cedar shingles, frame, insulating rock lath and gypsum plaster by U. S. Gypsum Co. Floor construction—wood joists, sub-floor, paper and finished oak.

ROOF
Wood rafters and shingle lath, covered with red cedar shingles.

CHIMNEY
Lining—terra cotta. Damper—Donley Co.

SHEET METAL WORK
Flashing, gutters and leaders—copper.

INSULATION
Bright surface rock lath, U. S. Gypsum Co.

WINDOWS
Sash—double hung. Glass—single strength, quality B, Lustraglass, American Window Glass Co. Screens—copper mesh in wood frames.

STAIRS
Treads—oak. Risers—pine.

FLOORS
Main rooms—oak. Kitchen—linoleum covered, Congoleum-Nairn, Inc. Bathrooms—tile.

WALL COVERINGS
Main rooms—wallpaper. Kitchen and bathrooms—tile, Pardee-Matawan Tile Co.

WOODWORK
Trim and doors—white pine. Garage doors—swinging type. All woodwork by Morgan Sash & Door Co.

HARDWARE
Interior and exterior—Schlage Lock Co.

PAINTING
All paint Dutch Boy, National Lead Co.

ELECTRICAL INSTALLATION
Wiring system—BX. Fixtures—direct.

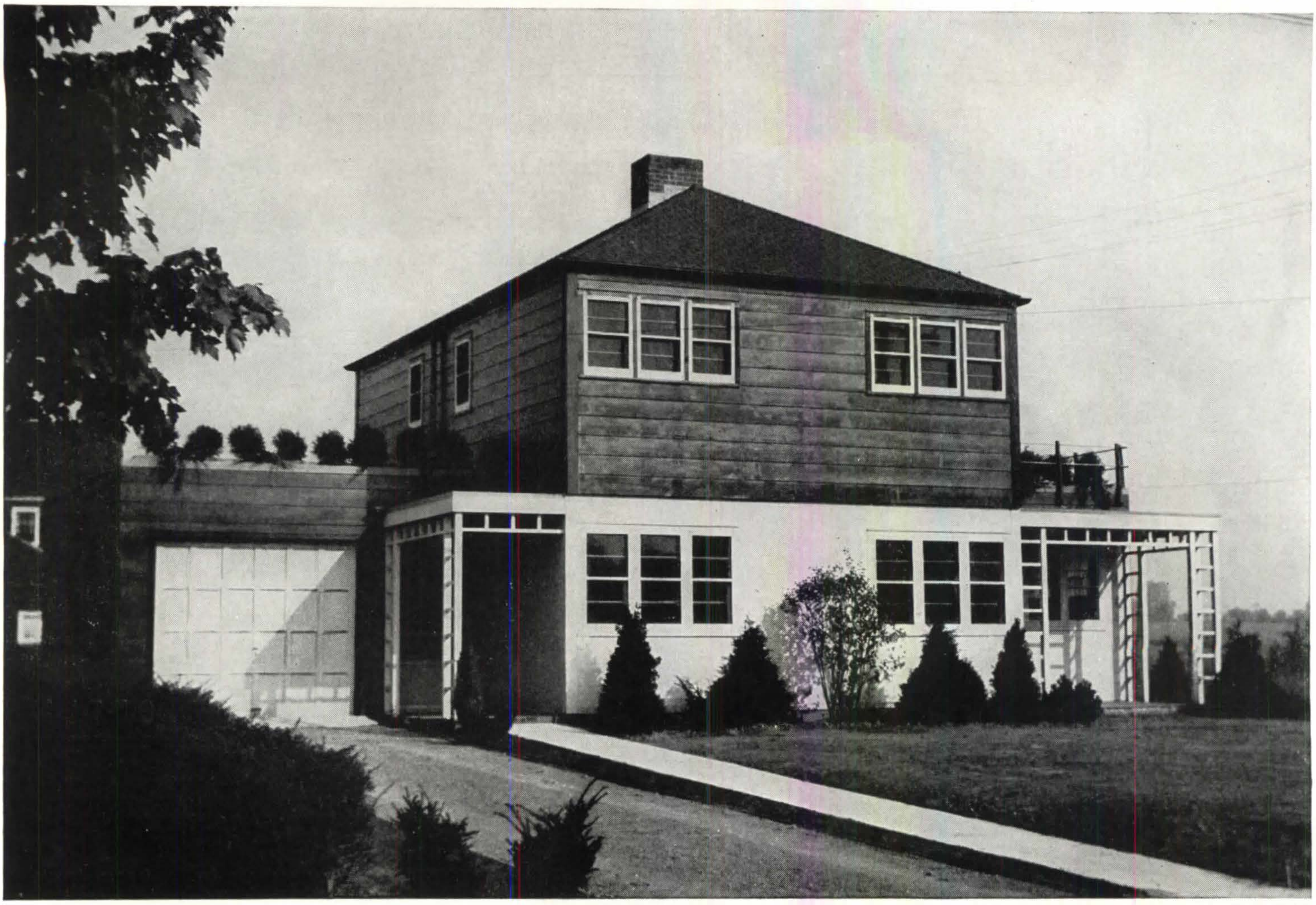
KITCHEN EQUIPMENT
Stove—Magic Chef, American Stove Co. Refrigerator—Westinghouse Electric & Manufacturing Co.

BATHROOM EQUIPMENT
All fixtures by Standard Sanitary Manufacturing Co.

PLUMBING
Pipes: Soil and waste—cast iron. Water supply—copper and brass.

HEATING AND AIR CONDITIONING
Air conditioning, filtering and humidifying by Superfex, Fox Furnace Co.

50. HOUSE IN ELMIRA, NEW YORK

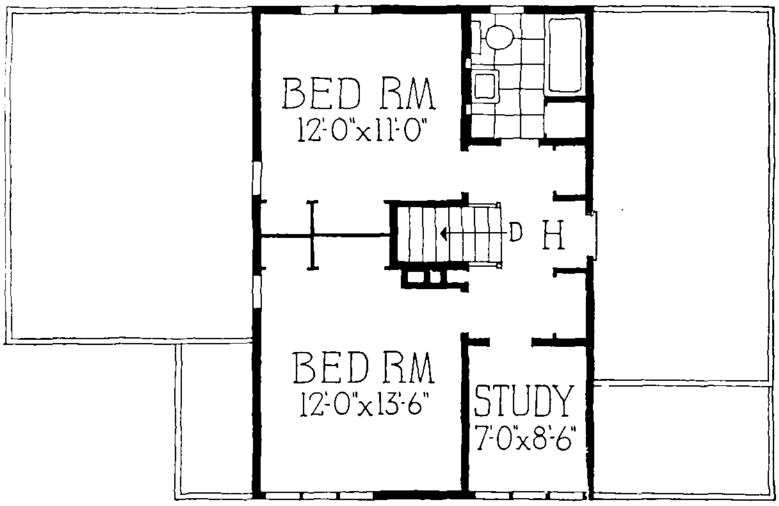


C. R. Elliott

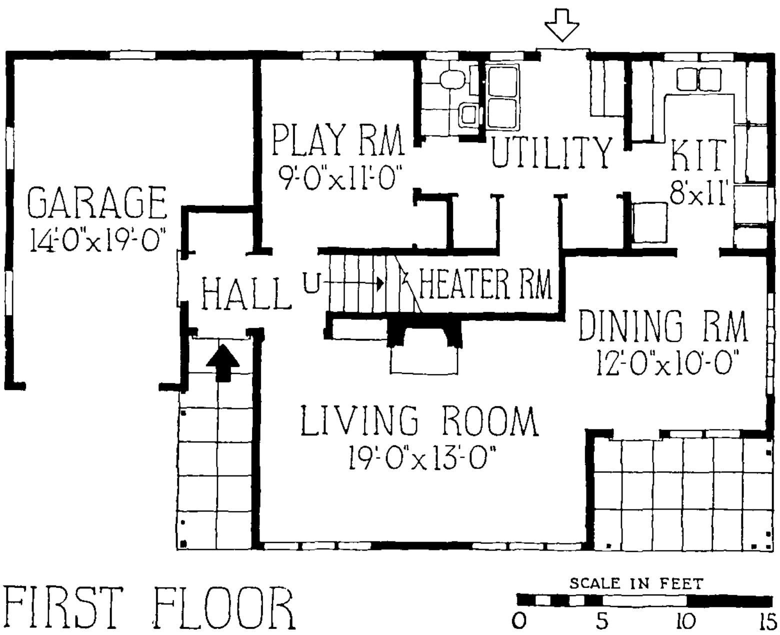
PROBLEM: To build a demonstration house incorporating the latest improvements in plan and equipment.

The house was built on a 60-foot lot in a restricted residential area. A cellar was omitted because of water conditions, and replaced by a large storage space at one side of the attached garage. The house was presented as a "zoned house" because of the possibility of separating the various family activities. One useful feature is the play room, which can also be used as a guest room, where children's play can be supervised from either the kitchen or the living room.

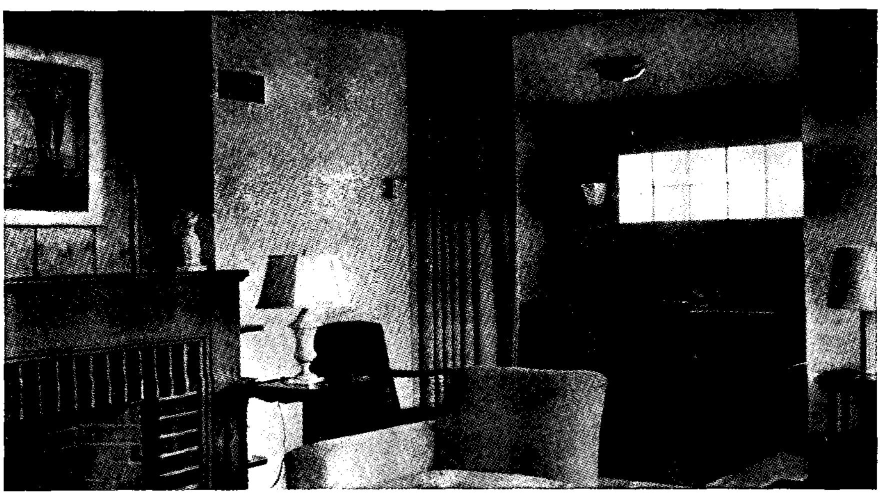
Cubage: 20,300. Cost: $8,400 at 41 cents a cubic foot.



SECOND FLOOR



FIRST FLOOR



LIVING-DINING ROOM

CONSTRUCTION OUTLINE

FOUNDATION
Walls—cinder block on concrete footings, continuous.

STRUCTURE
Exterior walls—redwood shiplap siding, wood sheathing, building paper, studs, and glass wool insulation. Interior partitions—wood studs, Reynolds Metals Co., Inc. Ecod lath and plaster, Floor construction—wood joists, sub-floor, paper and birch finish floor. Ceiling—Ecod lath, Reynolds Metals Co. and plaster.

ROOF
Wood rafters, sheathing, roofing paper covered with asphalt strip shingles, U. S. Gypsum Co. Deck construction—built-up roofing, Philip Carey Co.

CHIMNEY
Lining—terra cotta. Damper—H. W. Covert Co.

SHEET METAL WORK
Flashing, gutters and leaders—Armco galvanized iron, American Rolling Mills Co.

INSULATION
Outside walls and attic floor—glass wool, U. S. Gypsum Co. Weatherstripping—Unique cushion type, Unique Window Balance Co.

WINDOWS
Double hung, pine, Unique Window Balance Co. Glass—double strength, quality A, Pittsburgh Plate Glass Co. Screens—bronze wire cloth on wood frames.

STAIRS
Risers and stringers—white pine. Treads and wall rail—birch.

FLOORS
Living room, bedrooms and halls—birch. Kitchen—Sealex linoleum, Congoleum-Nairn, Inc. Bathrooms—rubber with cove base, The Goodyear Tire & Rubber Co.

WALL COVERINGS
Living room, bedrooms and halls—wallpaper, Richard E. Thibaut, Inc. Bathrooms—wainscot of Marlite, Marsh Wall Products Co.

WOODWORK
Trim, shelving and cabinets—fir plywood. Interior doors—flush, 1⅜ in. Exterior doors—stock white pine. Garage doors—overhead type, Ro-way, Rowe Manufacturing Co.

PAINTING
Interior: Walls—3 coats lead and oil on plywood, shellac and flat varnish on knotty pine. Ceilings—casein. Floors—stained, sealed and waxed. Trim and sash—3 coats lead and oil. Exterior: Walls—2 coats linseed oil.

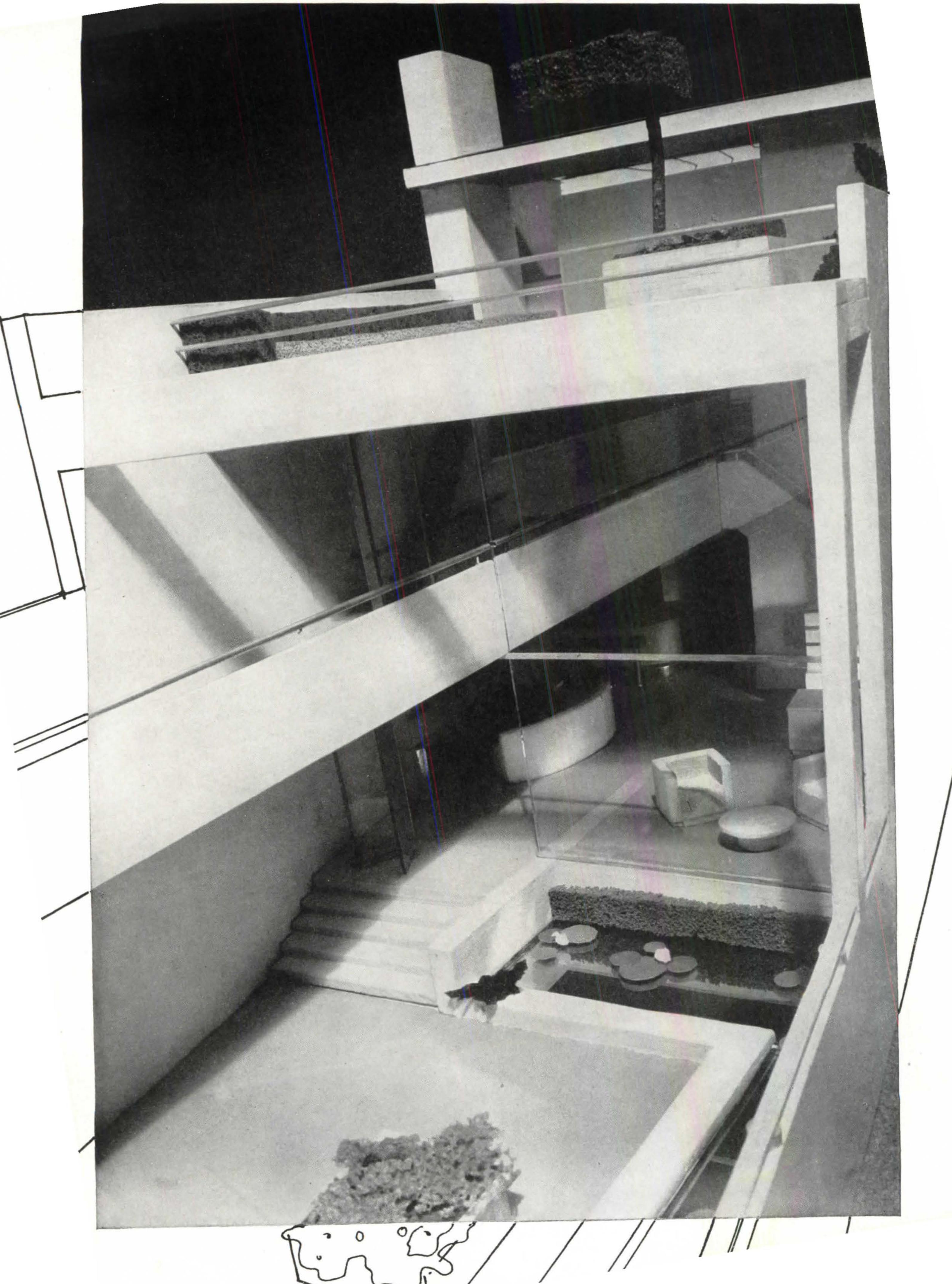
ELECTRICAL INSTALLATION
Wiring system—Romex cable, General Cable Co. Switches—Bakelite Corp. and General Electric Co. Fixtures—Lightolier Co.; bath and kitchen counter—Lumiline, General Electric Co.

KITCHEN EQUIPMENT
Sink—Crane Co.

BATHROOM EQUIPMENT
Shower—Speakman Co. All other fixtures by Standard Sanitary Manufacturing Co.

PLUMBING
Pipes: Soil and waste—cast iron. Water supply—copper, streamline fitting, Streamline Pipe & Fittings Co.

HEATING AND AIR CONDITIONING
Gas, direct fired furnace. Lennox forced air system with filters and humidifier, Lennox Furnace Co. Regulator—Minneapolis-Honeywell Regulator Co. Hot water heater—American Radiator Co.



51. CITY HOUSE AND GARDEN

ERNEST BORN, ARCHITECT

C. BERTIL LUND, ASSOCIATE THOMAS D. CHURCH, LANDSCAPE ARCHITECT

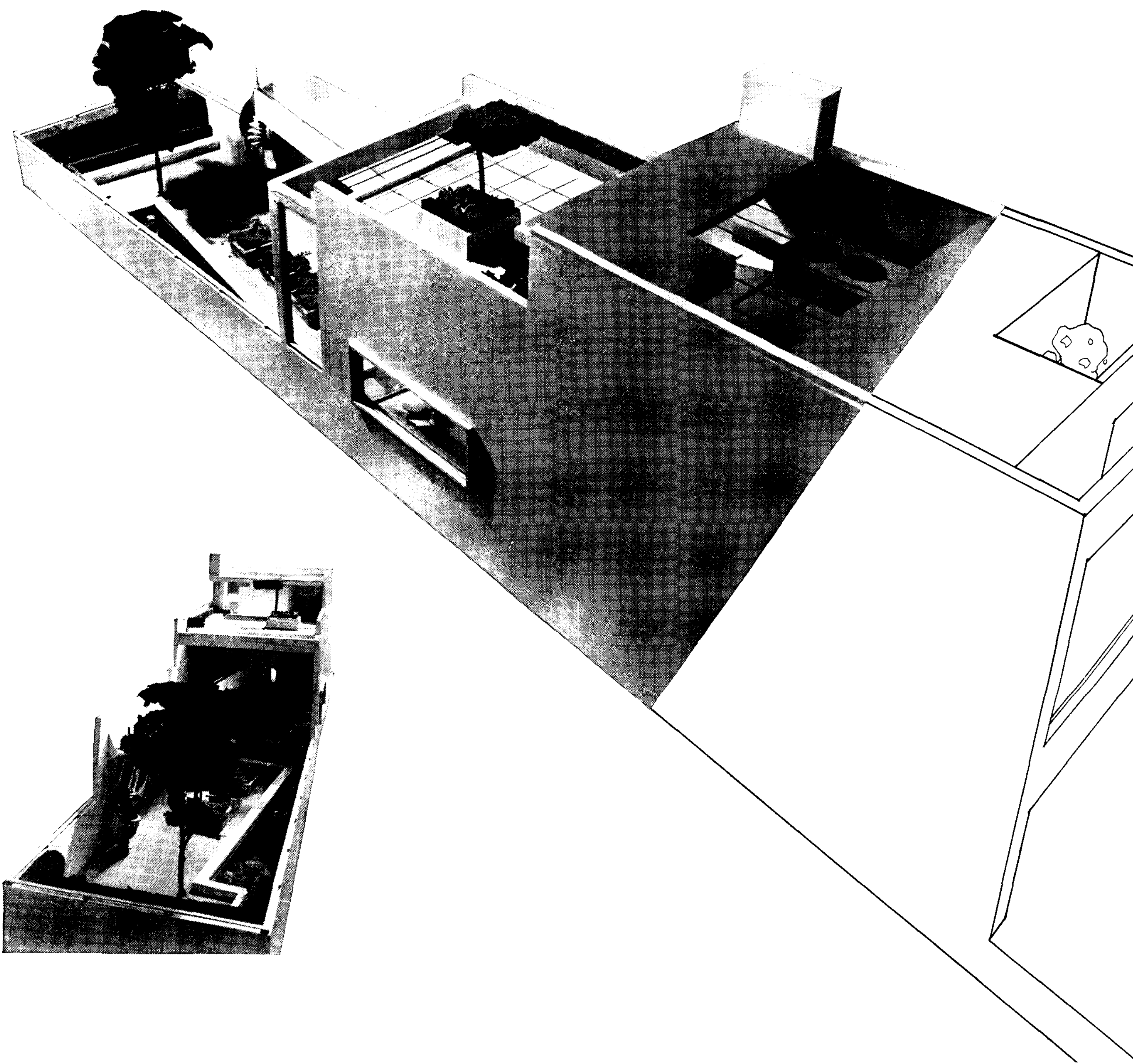
This project, recently awarded first prize in a competition held in conjunction with the San Francisco Exhibition of Landscape Architecture, is so brilliant a solution of a by no means uncommon problem that it is here offered as an example of the potentialities of the architect who is willing to think clearly and creatively.

The problem was to design a house and garden for a 25-foot city plot.

The architect and landscape architect comment: "Essentially the house consists of two units: (1) a living and eating space (with kitchen, bar, etc.), (2) a space for retirement, privacy, sleeping.

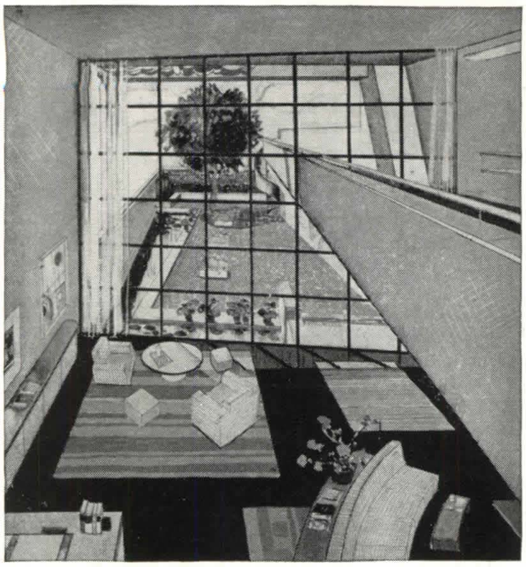
"The general living area on the ground floor is in intimate relation with the garden, which is conceived as an extension of the interior living and entertaining area. Effort has been made to treat these areas of interior and exterior living in such a way as to eliminate a hard and fast separation between them. The dining balcony, wide at the kitchen end, tapers down to the width of the circular stair in the garden. Besides creating a pleasant effect inside and out, this device acts strongly to splice the outside and inside together. The great area of glass acts neither as wall nor window, but merely as physical agent for the control of inside temperatures, yet rendering the garden a source of stimulation and delight to the inside occupants.

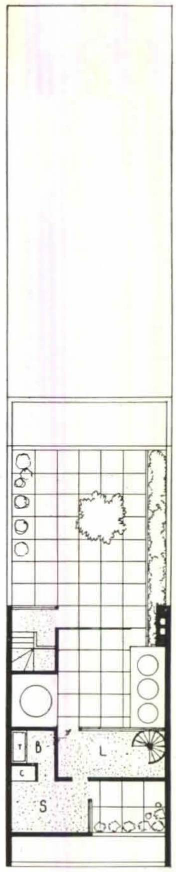
"A garden of this type has nothing to do with gardening, as such, but nevertheless serves to inspire a sense of garden without the trappings associated with the garden idea. First aim in the architecture is the development of space concepts—in the garden, that of form. Second aim, to completely unify and integrate these two fundamental objectives in terms of construction materials and planting so as to produce a dwelling unit lending itself to a fine tradition of living."



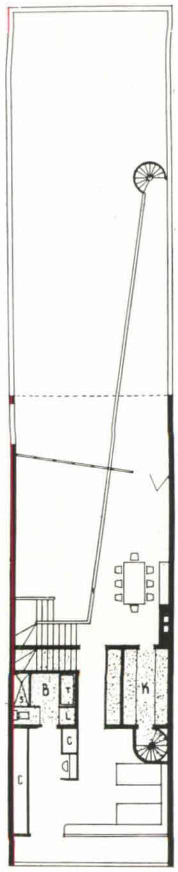
CITY HOUSE AND GARDEN

ERNEST BORN, ARCHITECT; C. BERTIL LUND, ASSOCIATE; THOMAS D. CHURCH, LANDSCAPE ARCHITECT

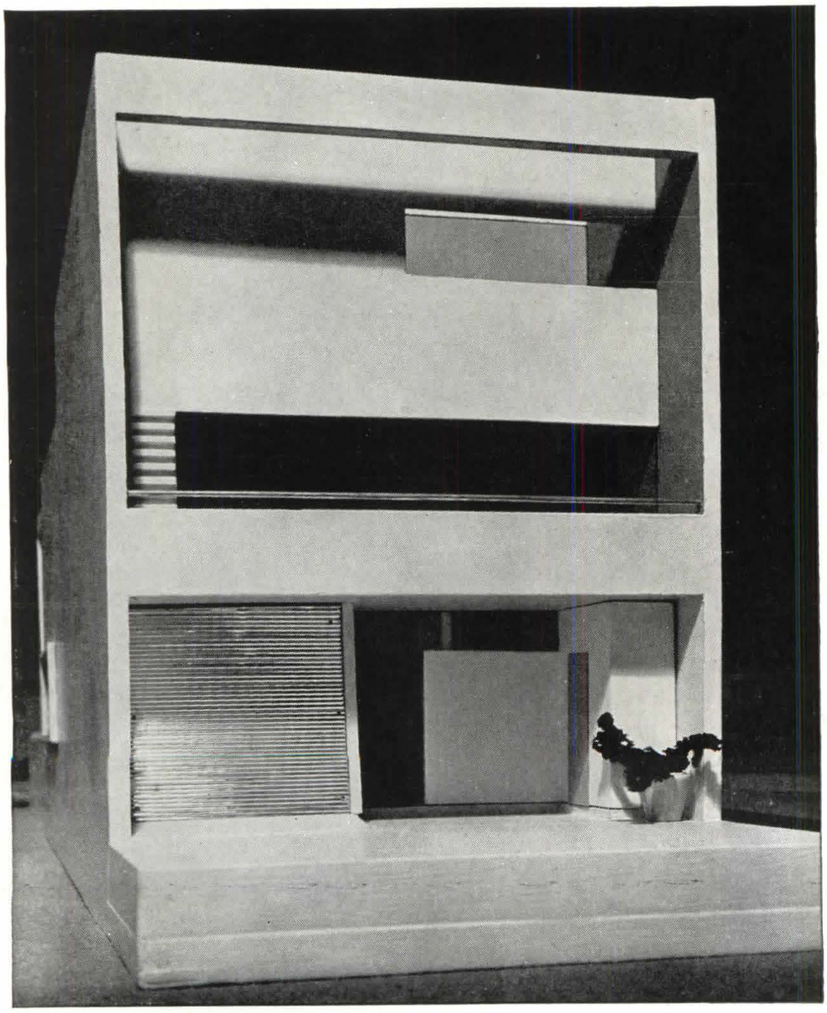


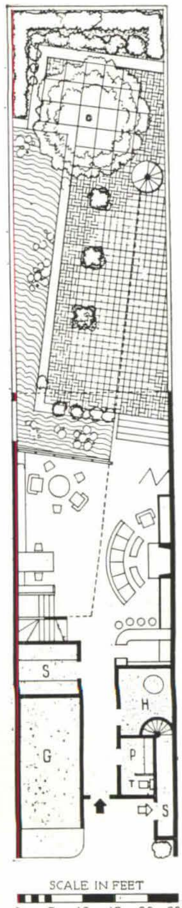


THIRD FLOOR



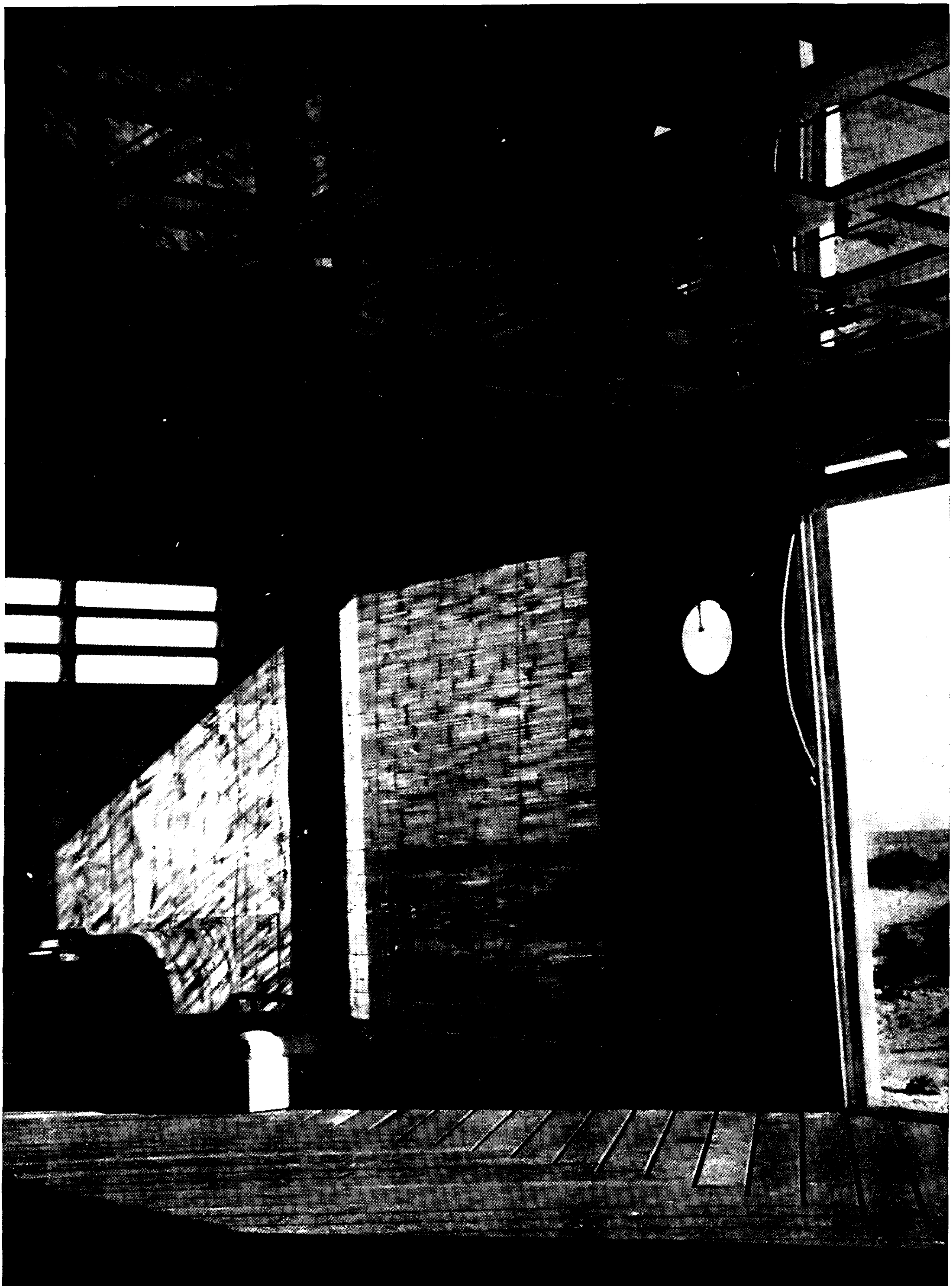
SECOND FLOOR

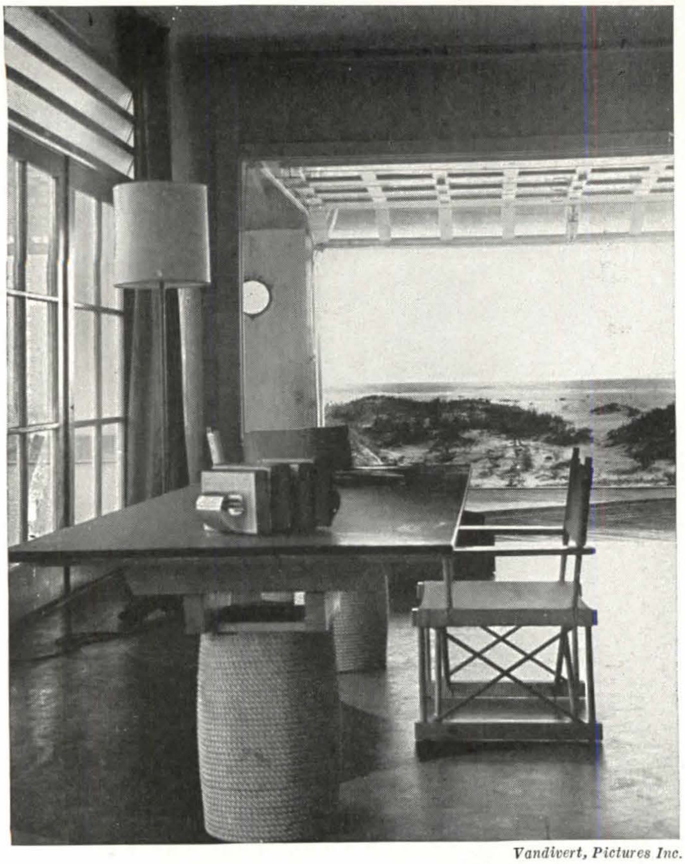




FIRST FLOOR.

PORTFOLIO OF CONTEMPORARY DETAILS

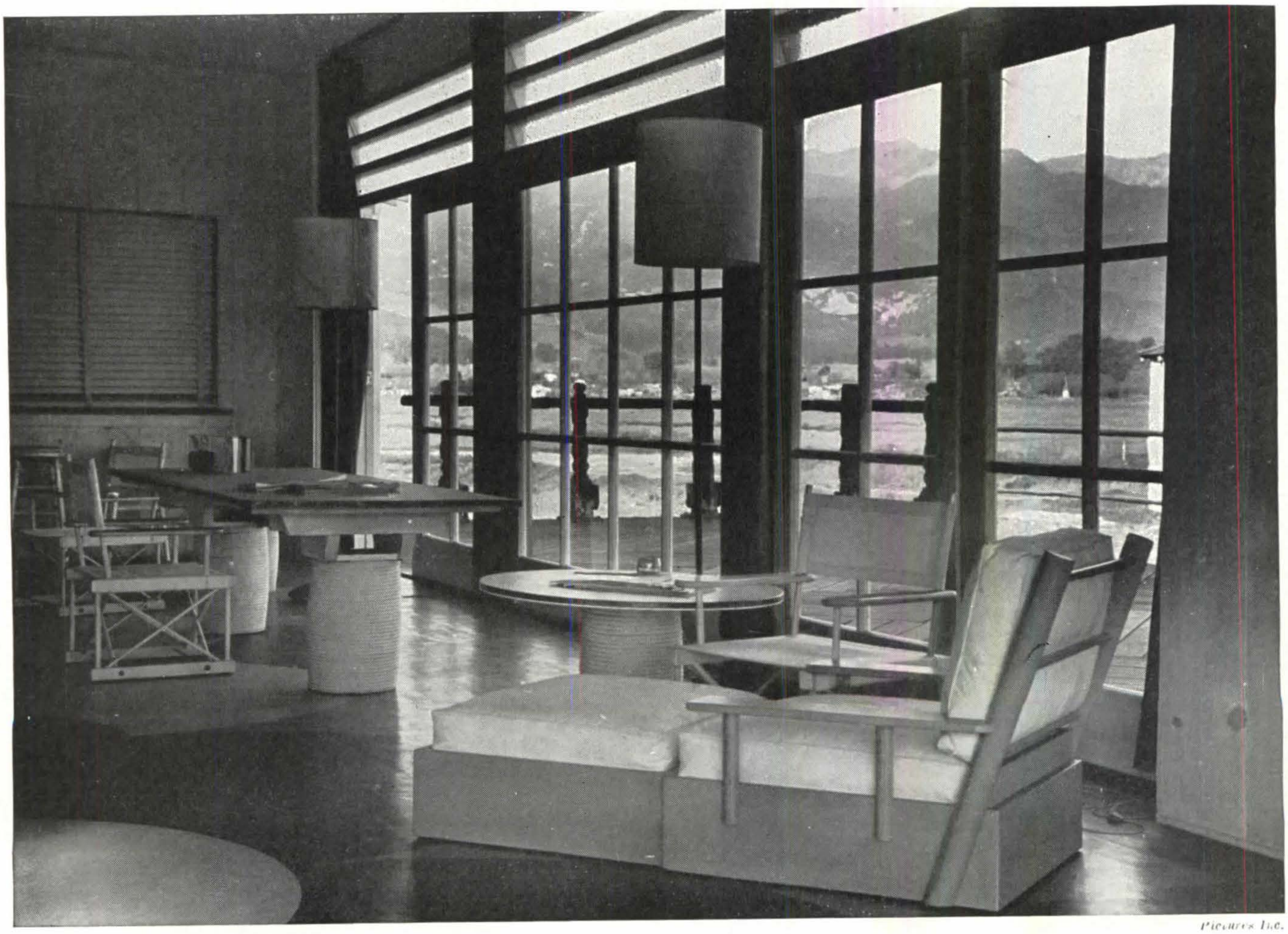




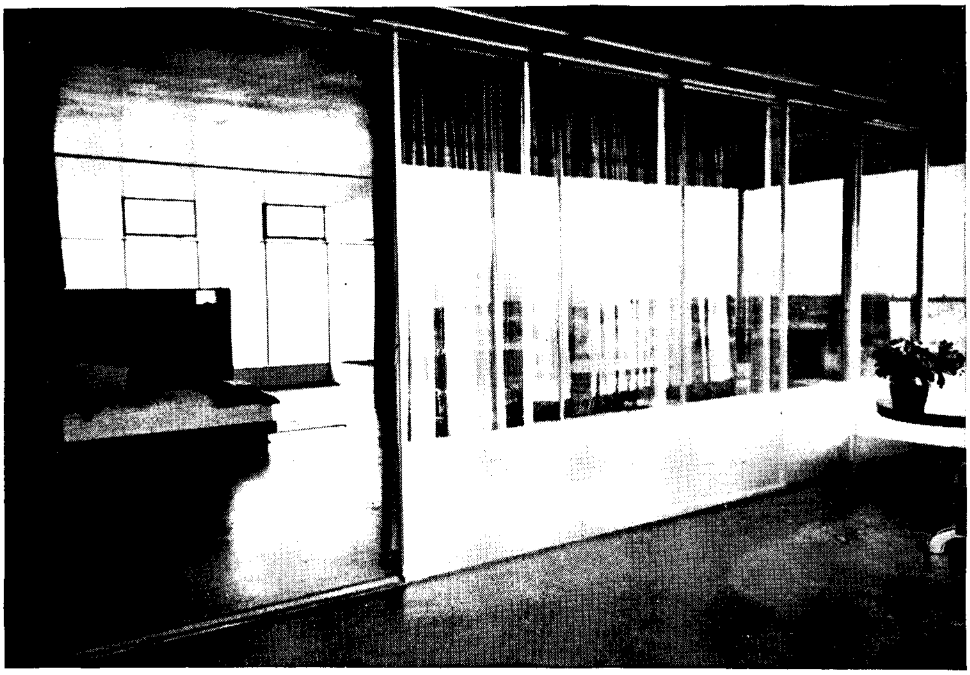
Vandivert, Pictures Inc.

The sixteen foot glazed end wall of this beach cottage living room may be raised to a position overhead on the ceiling, leaving the view of the ocean wholly unobstructed. Counterbalancing mechanism and guides are adapted stock garage door hardware.

LOCKWOOD DE FOREST, JR., DESIGNER

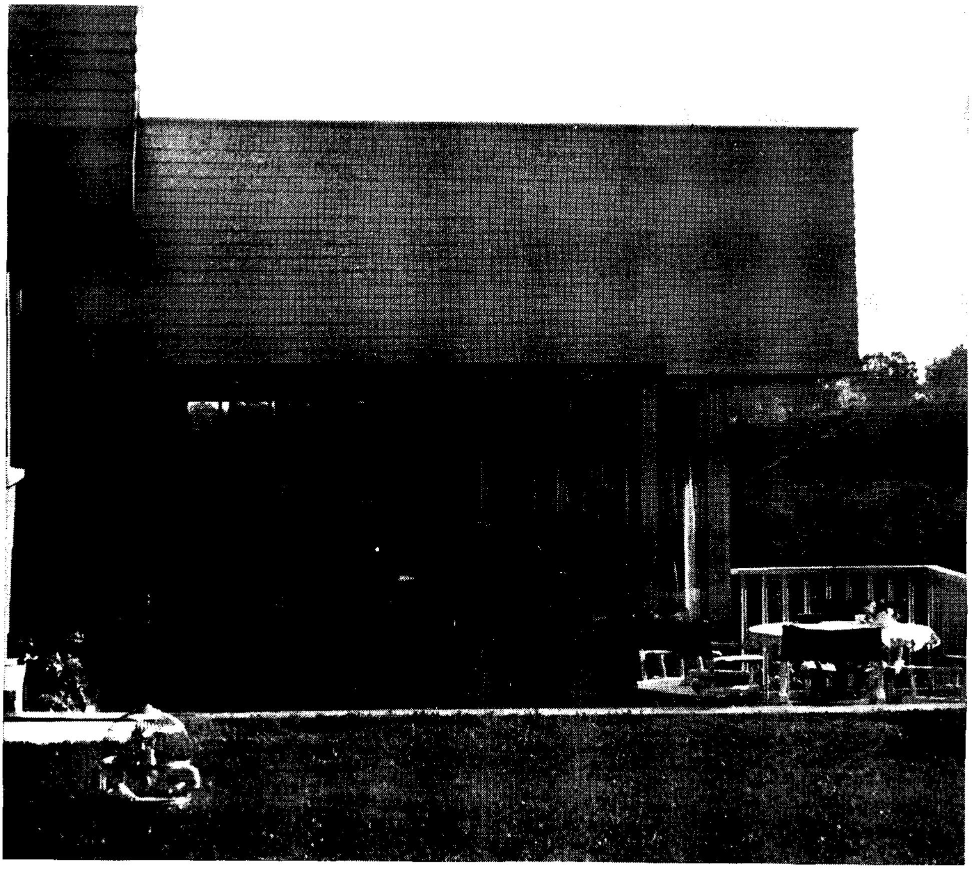


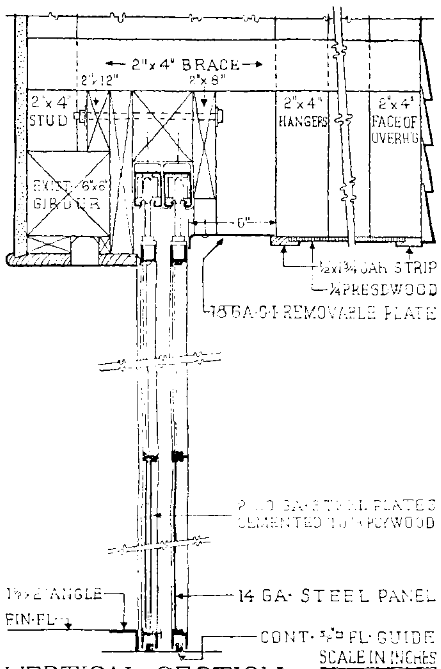
Pictures Inc.



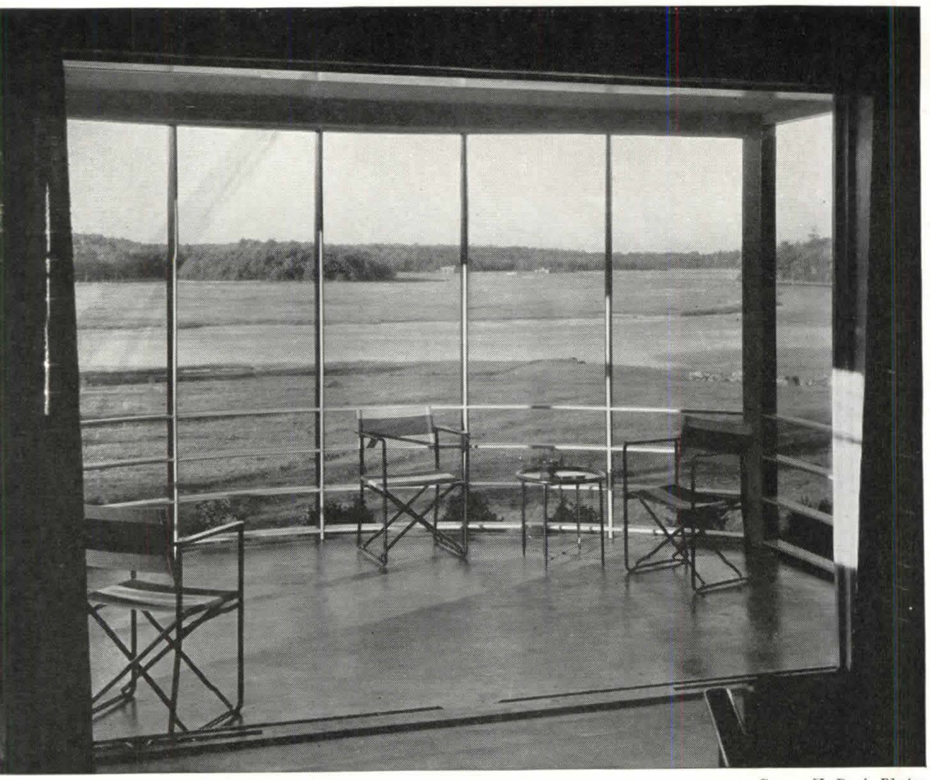
These steel framed horizontally sliding glazed doors are hung from rollers on a steel track recessed in a pocket in the lintel of the opening, as shown in the drawing below.

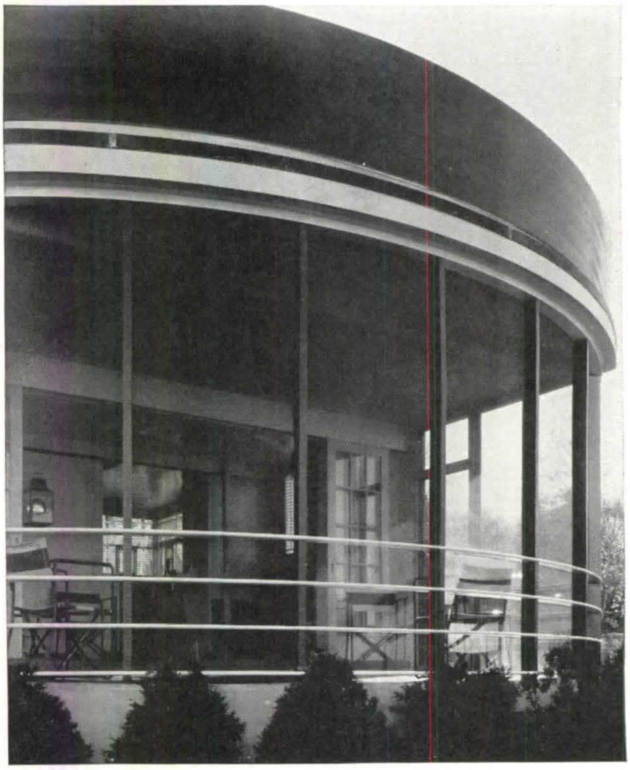
RICHARD J. NEUTRA, ARCHITECT





VERTICAL SECTION

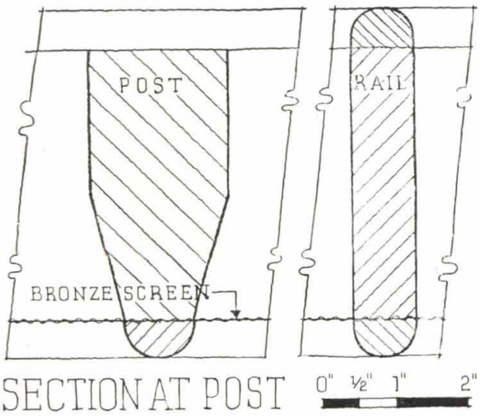




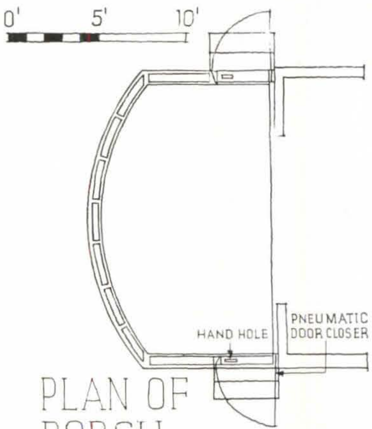
George H. Davis Photos

GEORGE C. WHITING, ARCHITECT

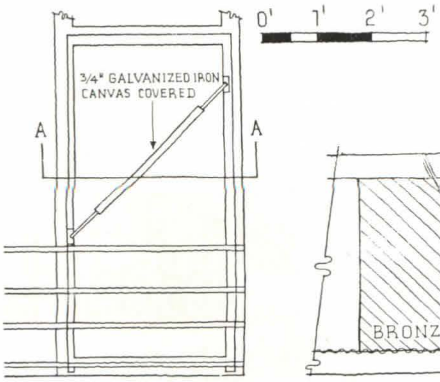
This screened porch is an excellent example of how much can be accomplished with ordinary materials and workmanship if the designer is sufficiently ingenious. A remarkable effect of lightness and openness has been achieved by simply champhering the edges of the screen frame and attaching an ordinary wood half-round to cover the tacks which hold the screen in place.



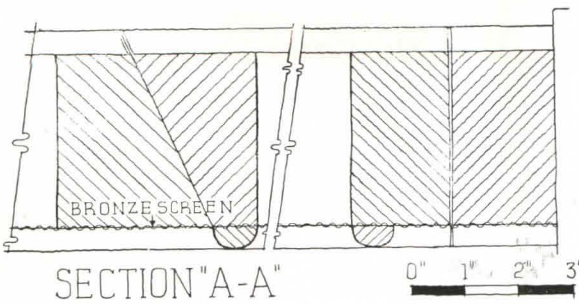
SECTION AT POST



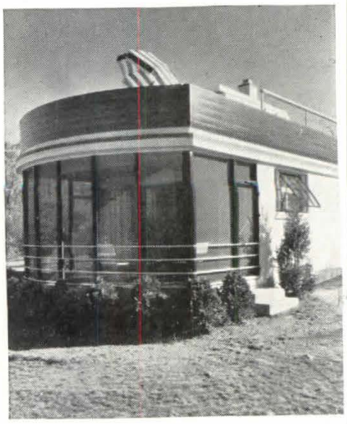
PLAN OF PORCH

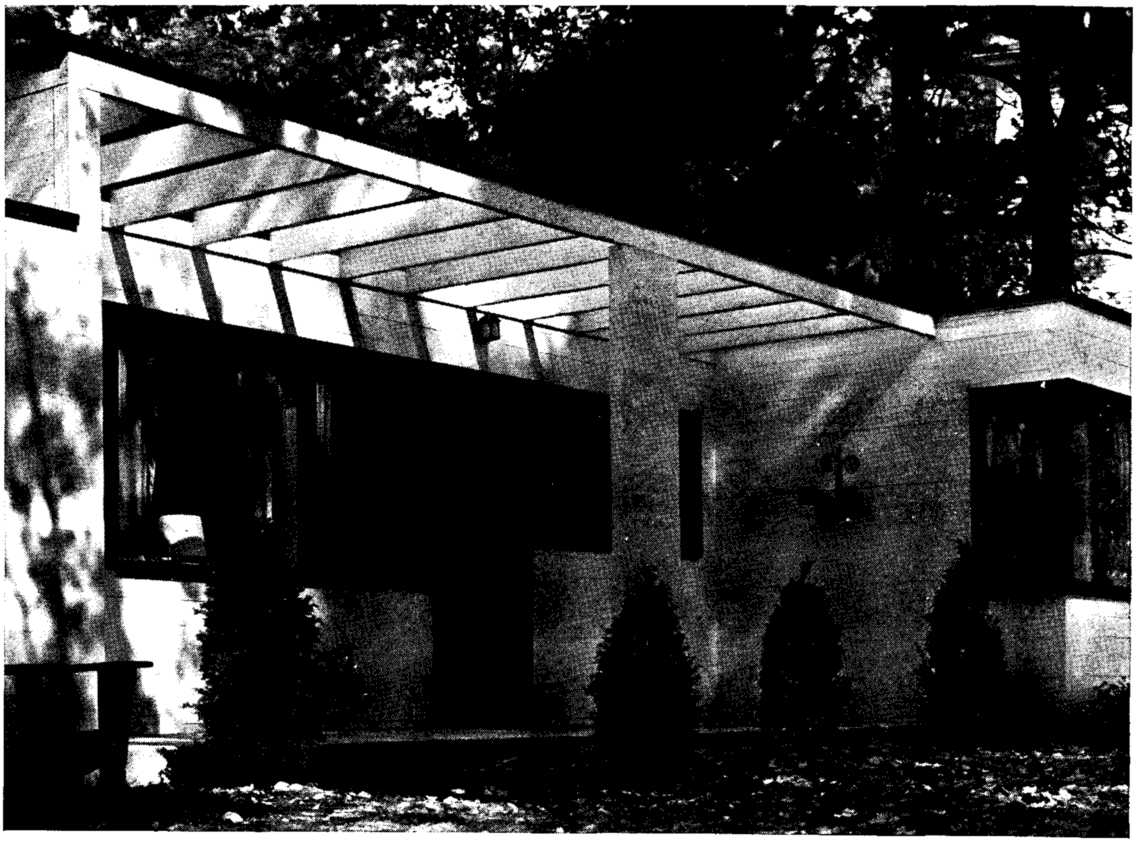


INSIDE ELEV OF DOOR



SECTION "A-A"



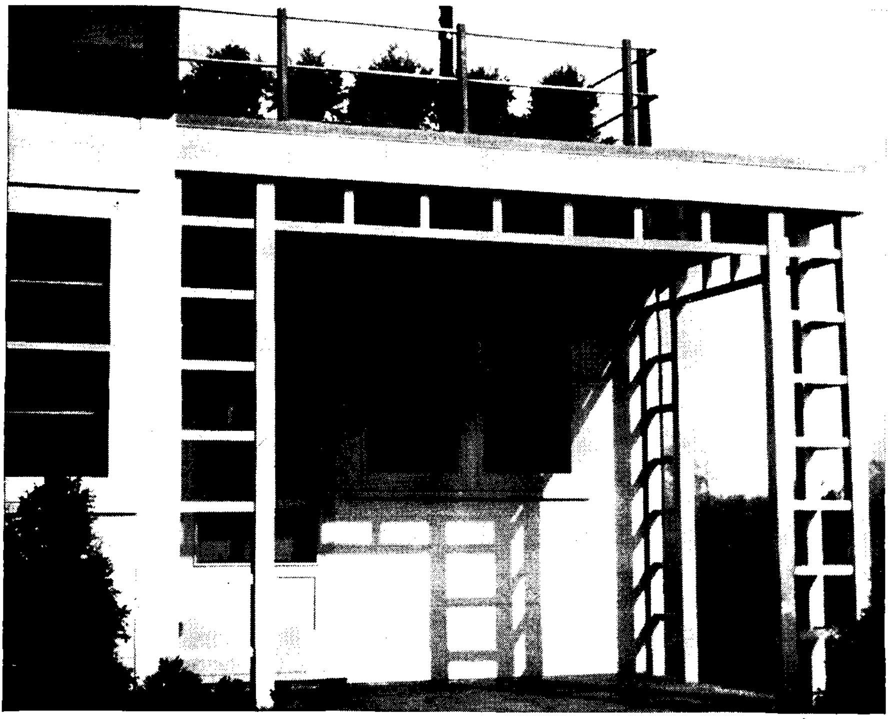


Arthur C. Haskell

ROYAL BARRY WILLS, ARCHITECT HUGH A. STUBBINS, ASSOCIATE

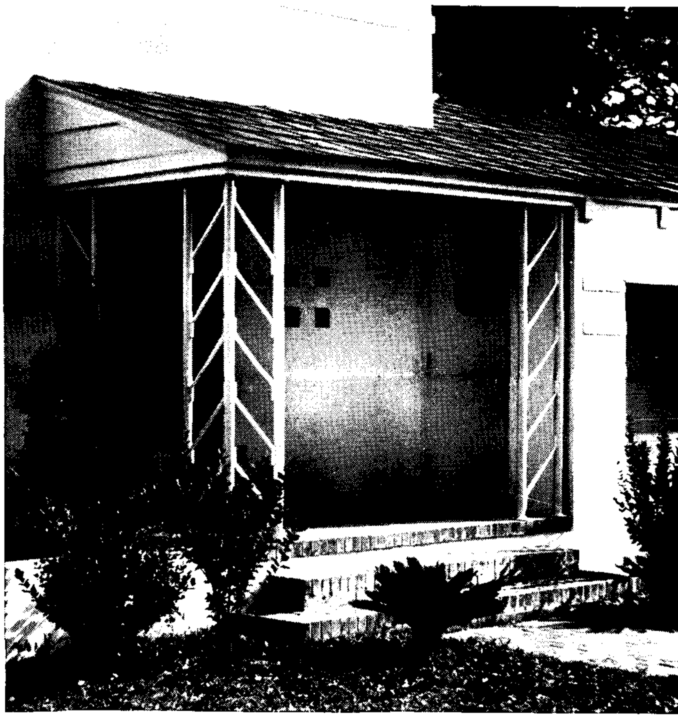
Corners of the porch shown below at the right are made by welding steel strips between standard pipe columns. The porch at the left is in wood.

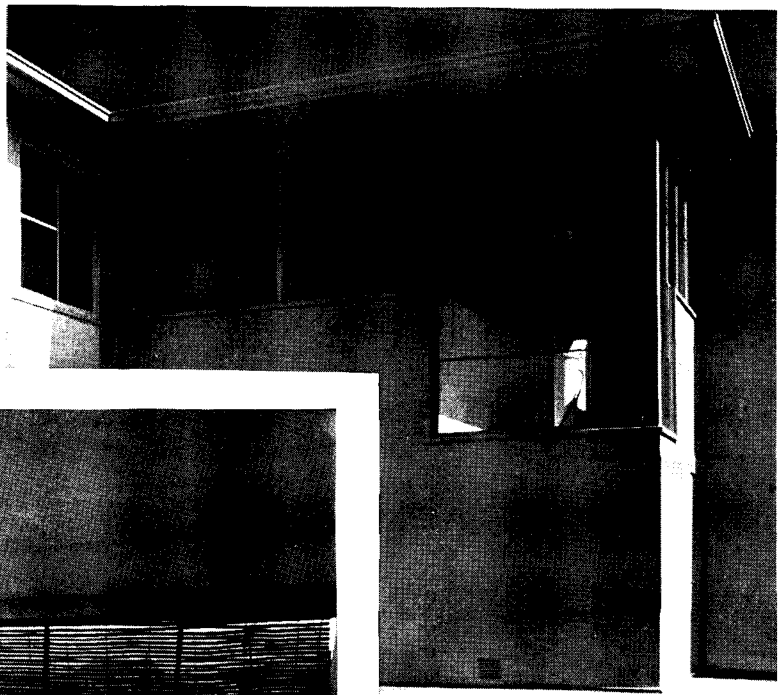
DONALD G. FUDGE, ARCHITECT



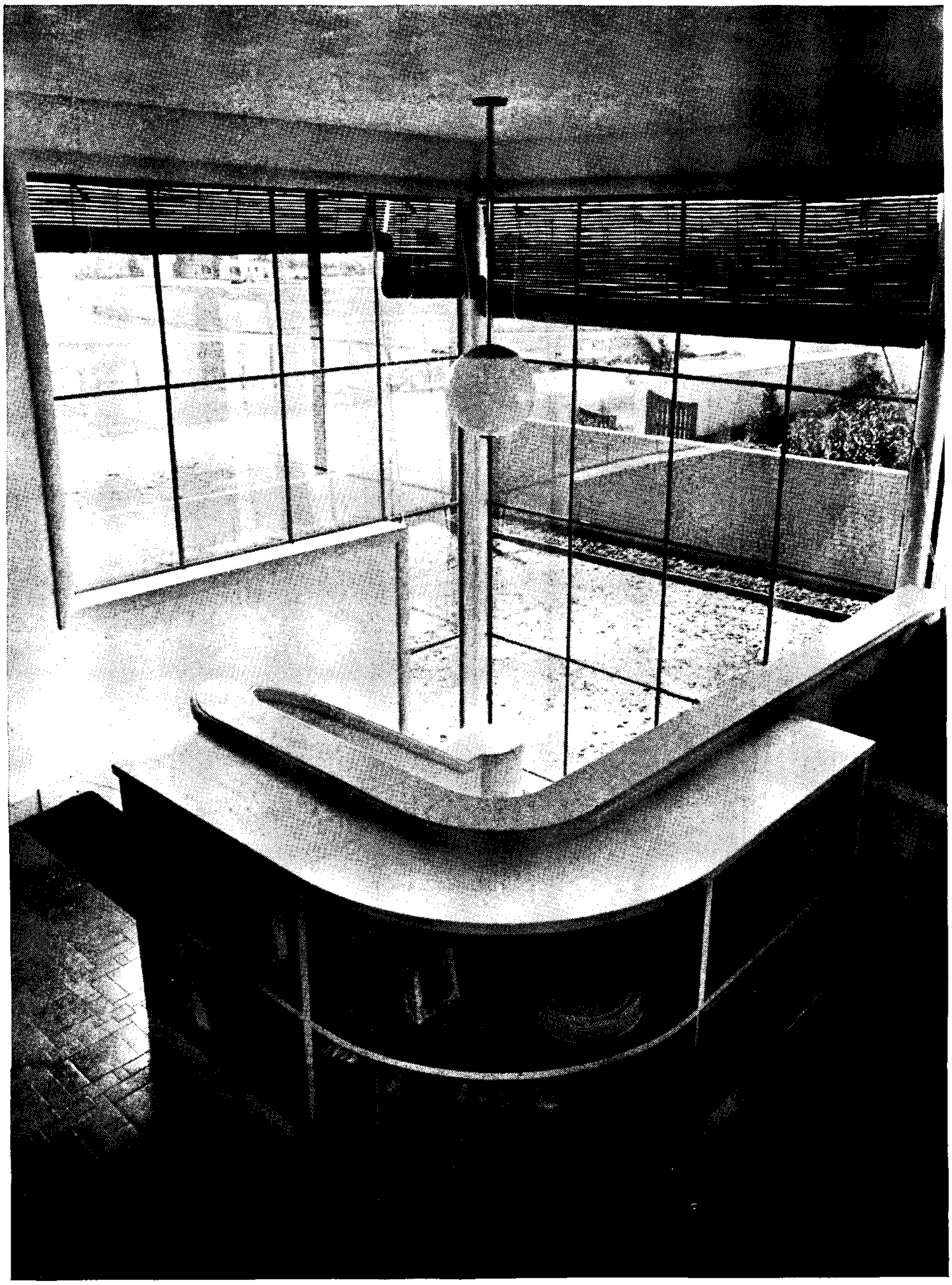
C. R. Elliott

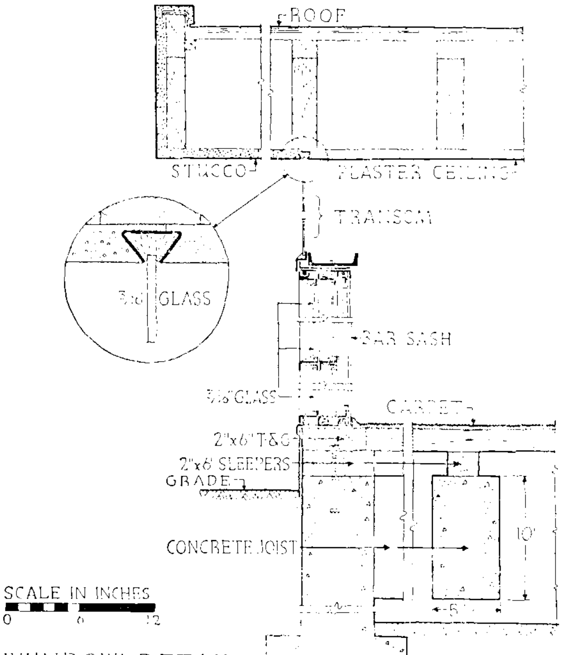
IVAN H. SMITH, ARCHITECT





WILLIAM WILSON WURSTER, ARCHITECT

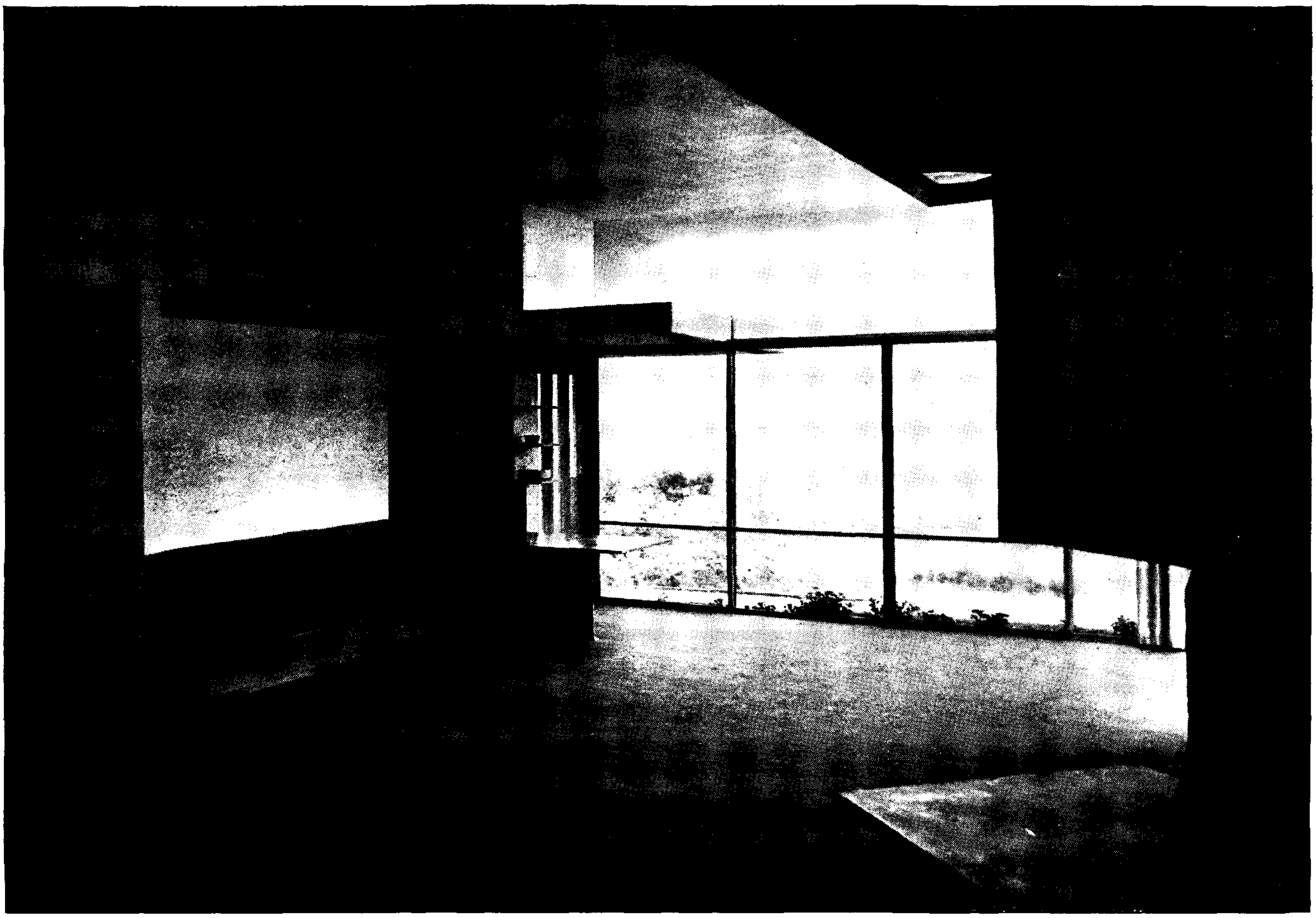




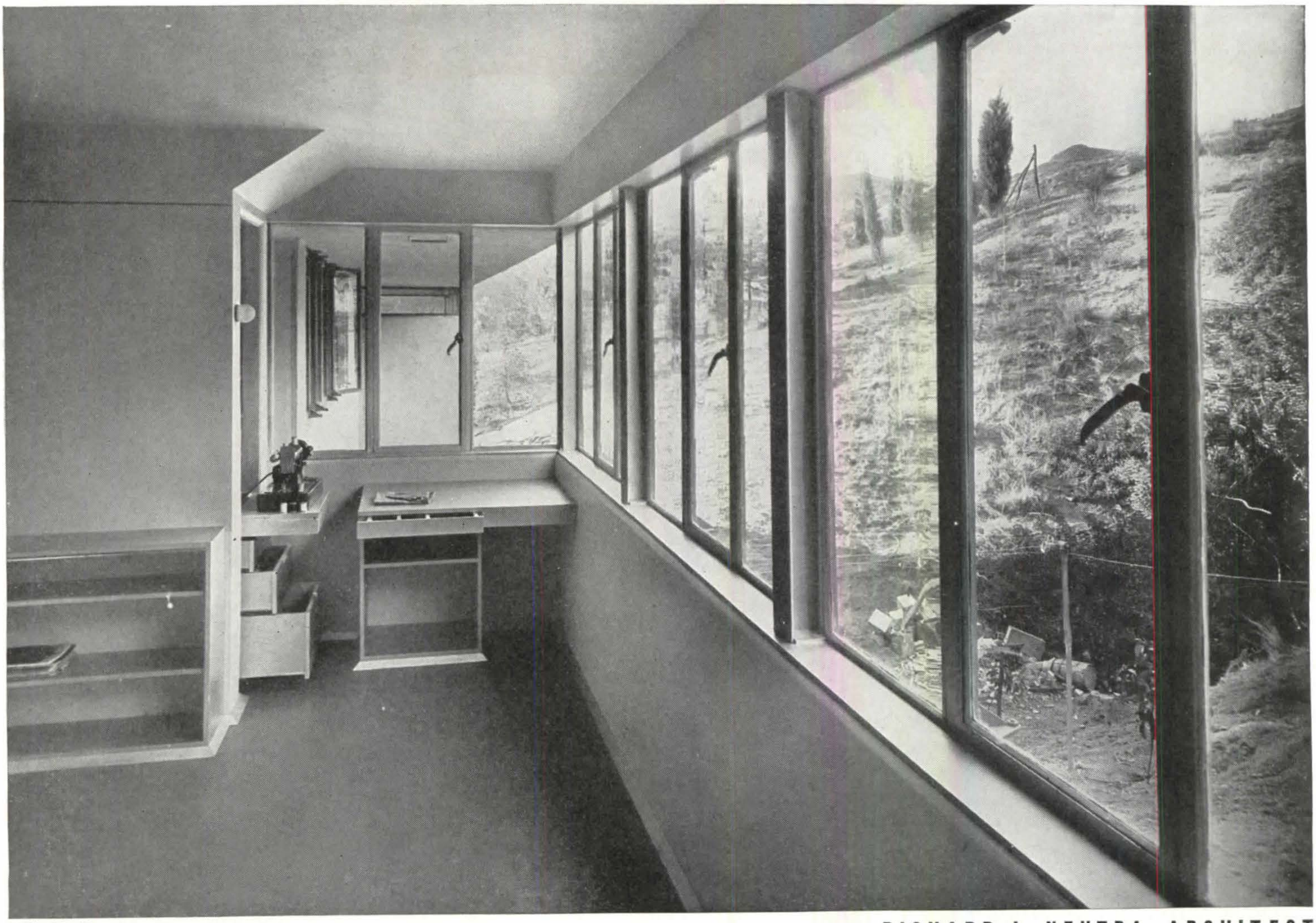
WINDOW DETAIL

The window on the left hand page serves a stair hall which is also used (on the second floor) as a sun room. The detail drawing at the right shows how the remarkable effect of openness in the transom of the window below is achieved.

R. M. SCHINDLER, ARCHITECT

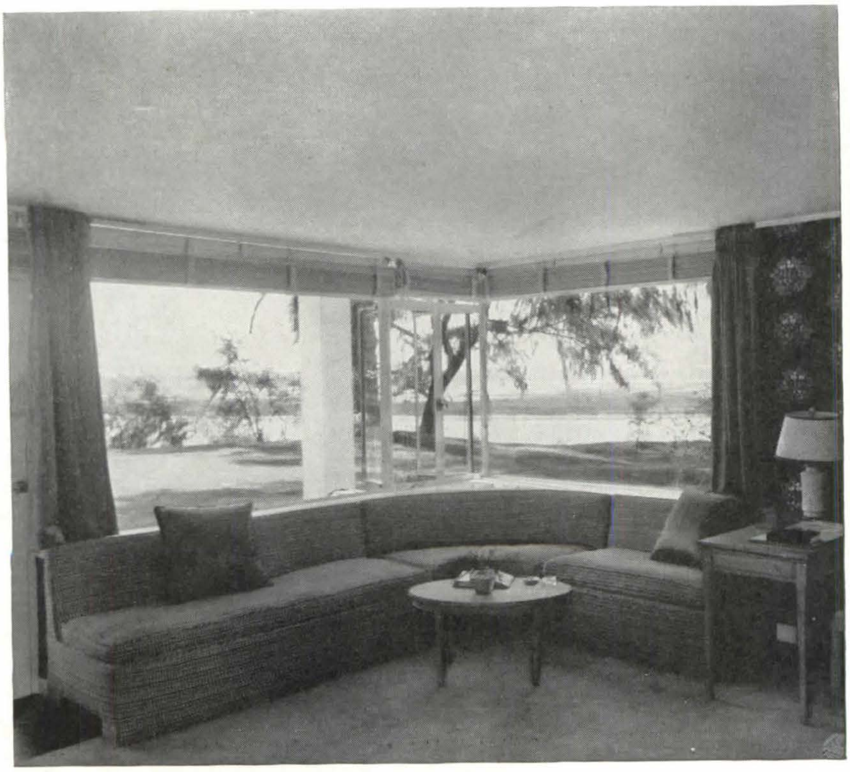


Julius Shulman

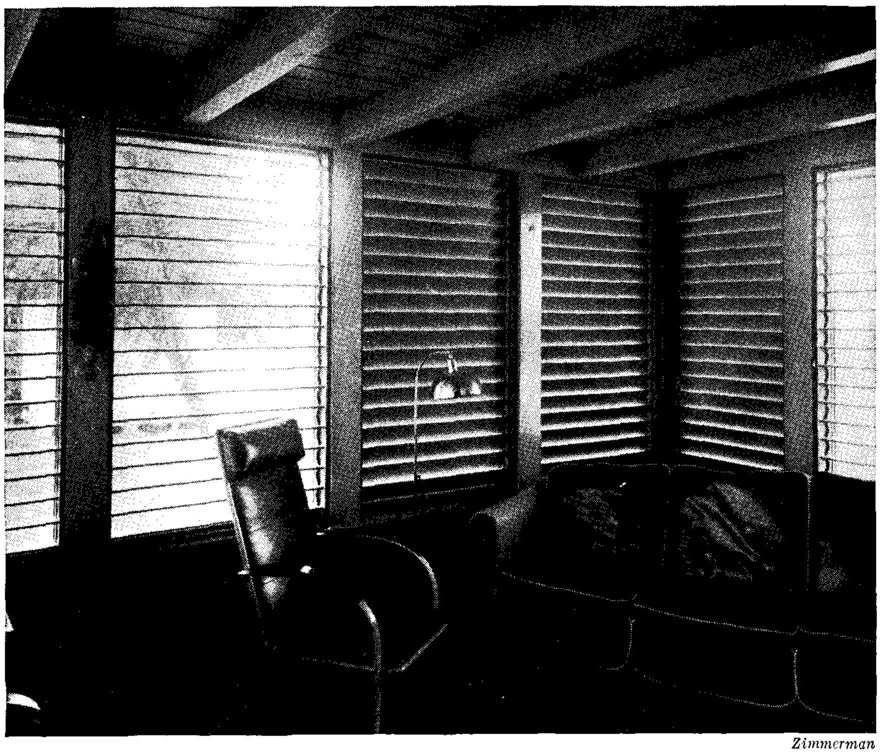


Willard D. Morgan

RICHARD J. NEUTRA, ARCHITECT

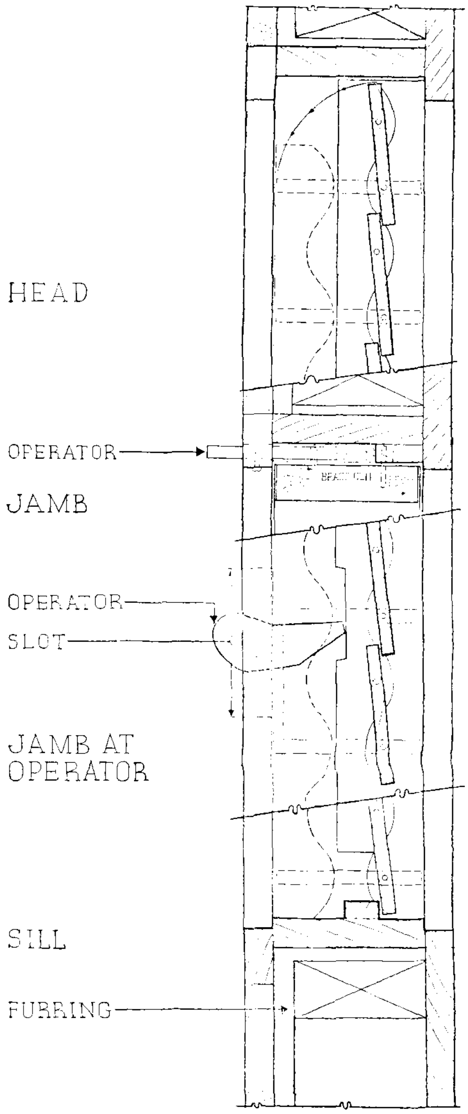


EDWARD D. STONE, ARCHITECT



Zimmerman

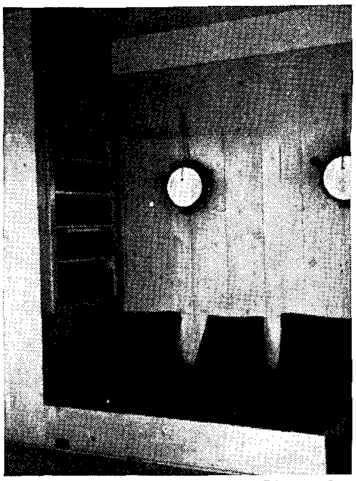
COURTNEY STEWART AND ROBERT HANSEN, ARCHITECTS



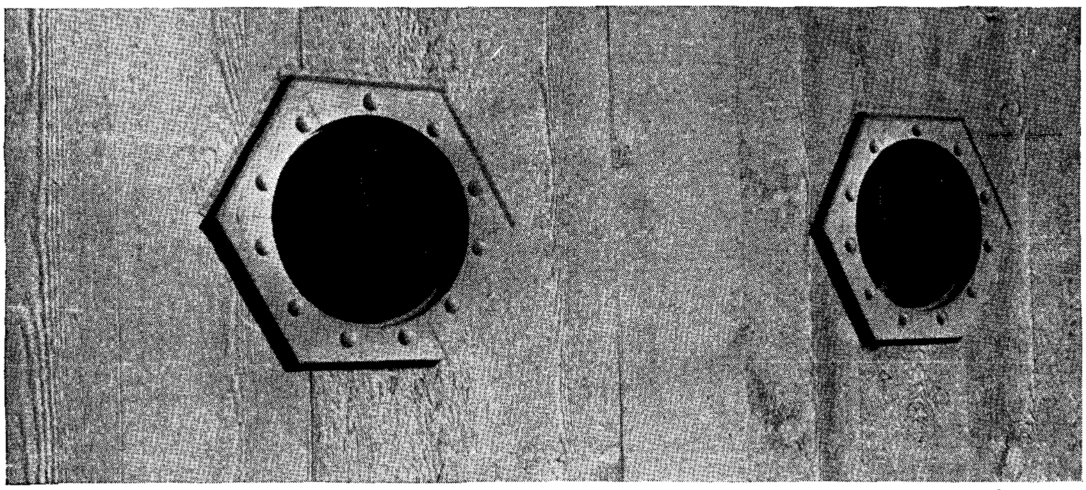
SECTION OF TILTING BLIND 0" 1" 2" 3"

The tilting blinds in the porch windows above may be fully opened and still exclude the hot sunshine, or tightly closed to protect the porch furniture in bad weather. The amusing port holes shown below are used in the sidewall of a beach cottage where a too closely adjoining house precludes the use of larger openings.

LOCKWOOD DE FOREST, JR., DESIGNER



Pictures Inc.



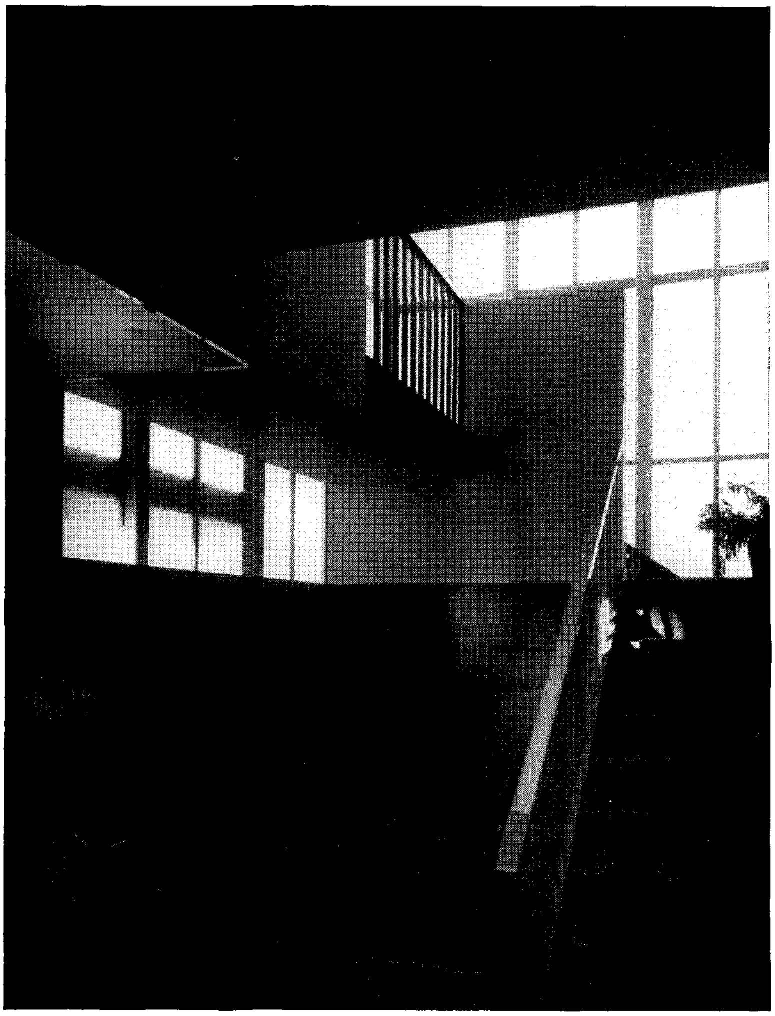
Pictures Inc.

C. F. HEGNER, ARCHITECT

Hyskell-Denner

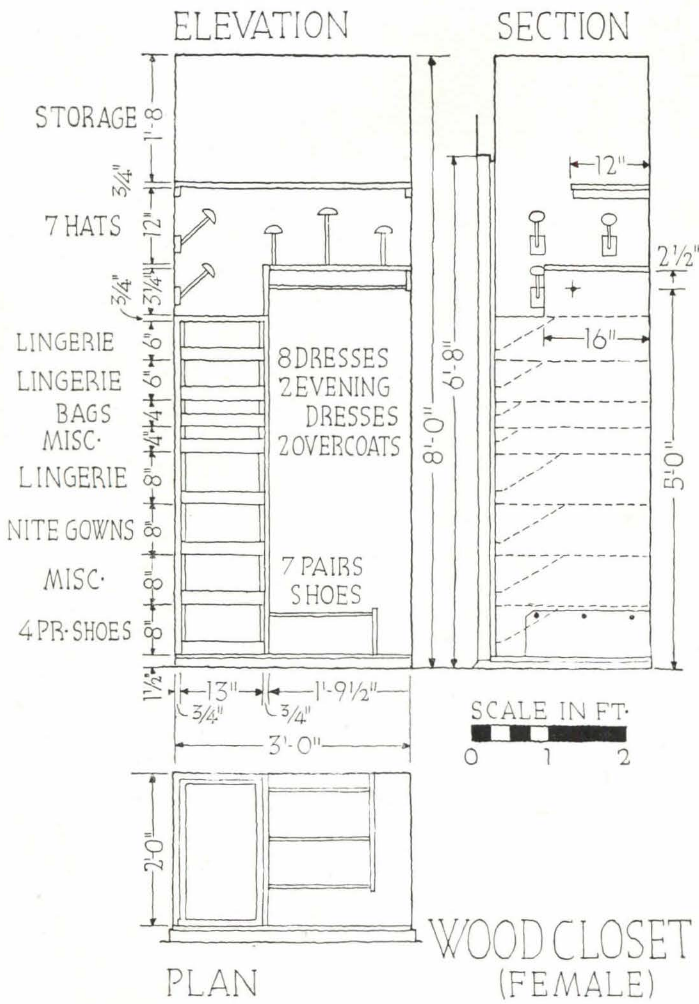
WESSEL, BRUNET & KLINE, ARCHITECTS

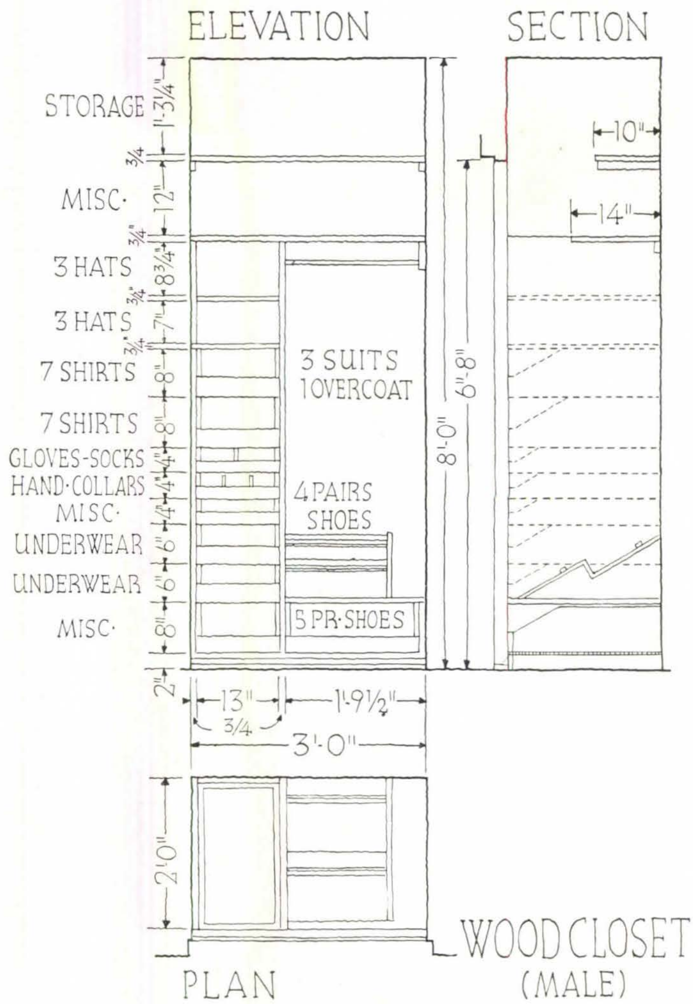
RICHARD J. NEUTRA, ARCHITECT



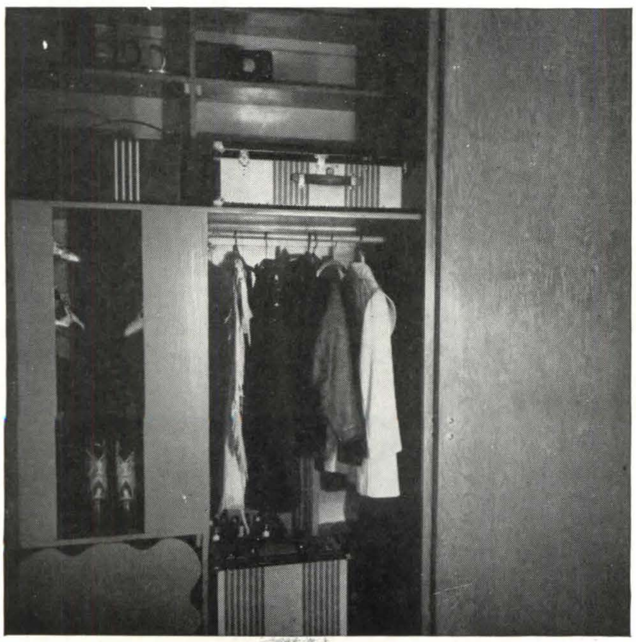
Luckhaus

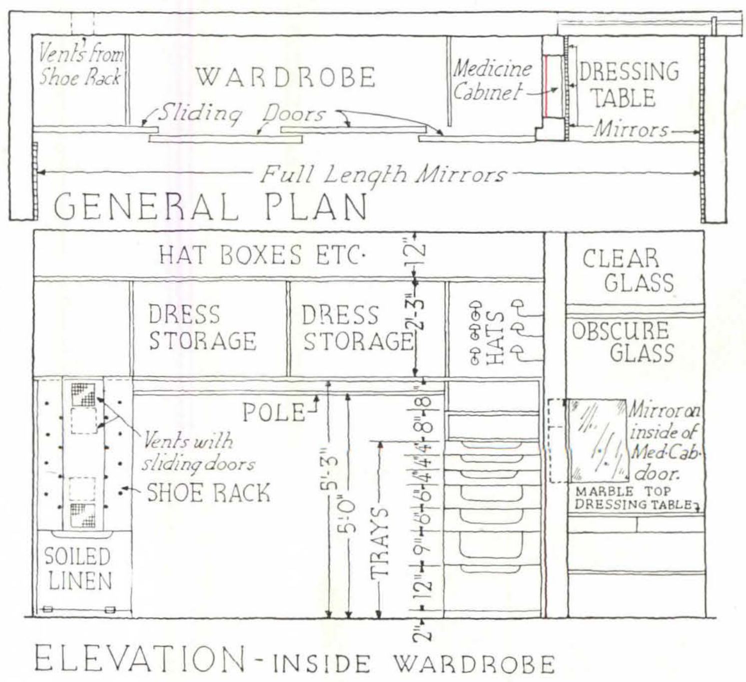
The excellent treatment of the handrail and balustrade shown on the opposite page demonstrates the importance of simplicity in handling this difficult problem. The stair at the lower right shows an interesting variation in which a section of the rail has been opened up to admit light to the stairs.





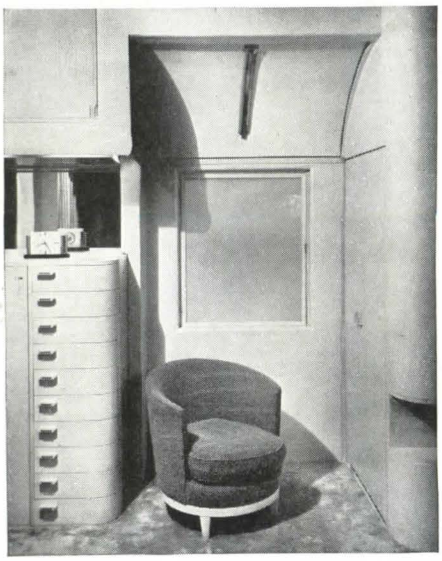
RICHARD J. NEUTRA, ARCHITECT



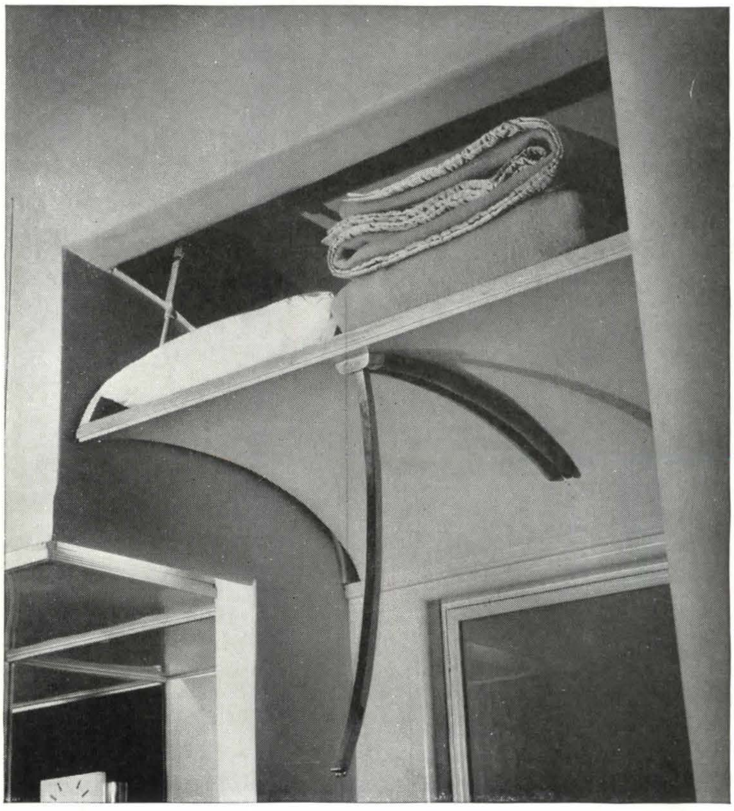


WESSEL, BRUNET & KLINE, ARCHITECTS

Primary appeal of modern architecture to the layman is its practicality, nowhere better illustrated than in built-in furniture and especially the built-in wardrobe. The excellent details on the opposite page show how much study Architect Richard J. Neutra has given this important problem. Below at the right is a special closet in a city apartment, where every square inch of space must be used to advantage.

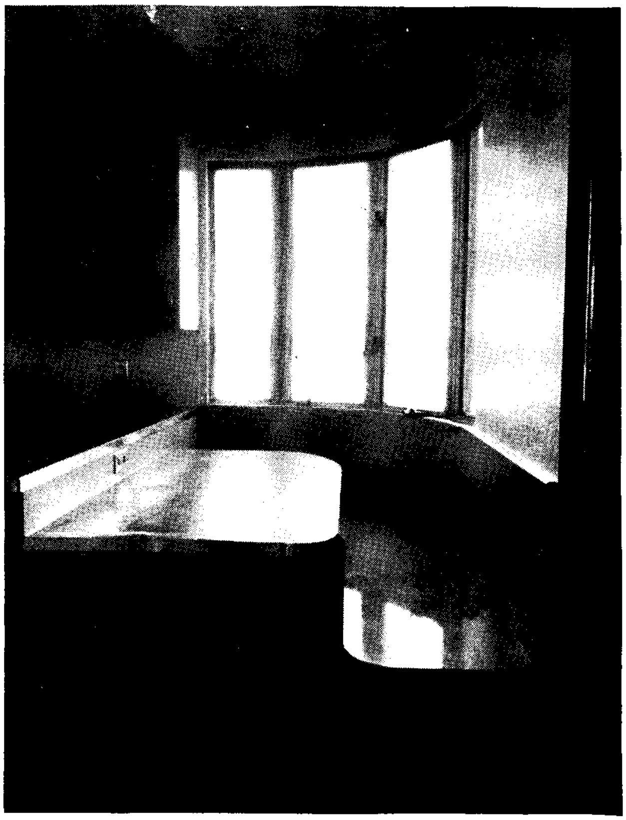


HAMMOND KROLL, DESIGNER



ROYAL BARRY WILLS, ARCHITECT HUGH A. STUBBINS, ASSOCIATE

Arthur C. Haskell



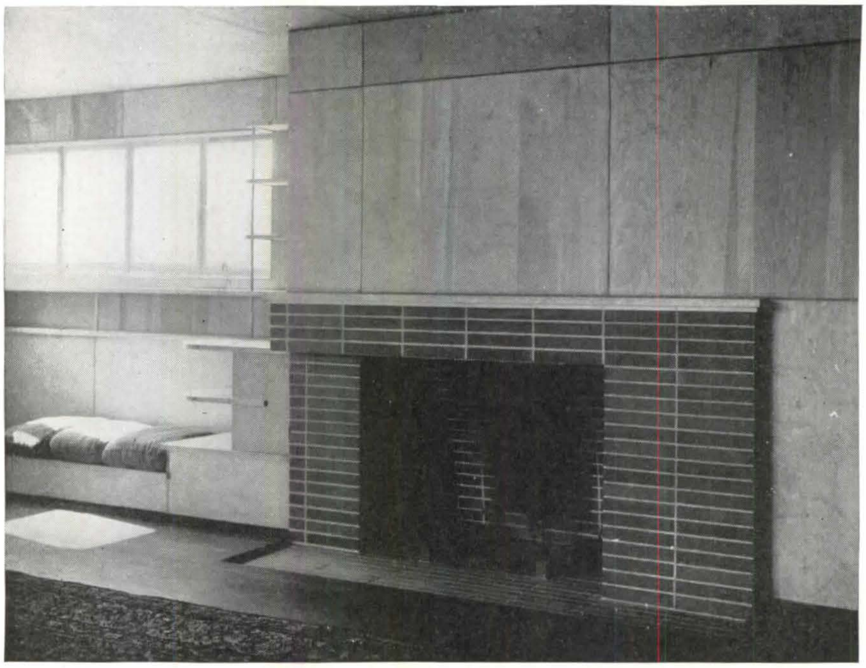
WESSEL, BRUNET & KLINE, ARCHITECTS

The attractive dining nook opposite shows how little space is actually required for this feature if it is properly planned. The chairs and table are stock furniture, designed by Russel Wright. The breakfast nook shown at the right is located in the corner of a small house kitchen.

RICHARD J. NEUTRA, ARCHITECT

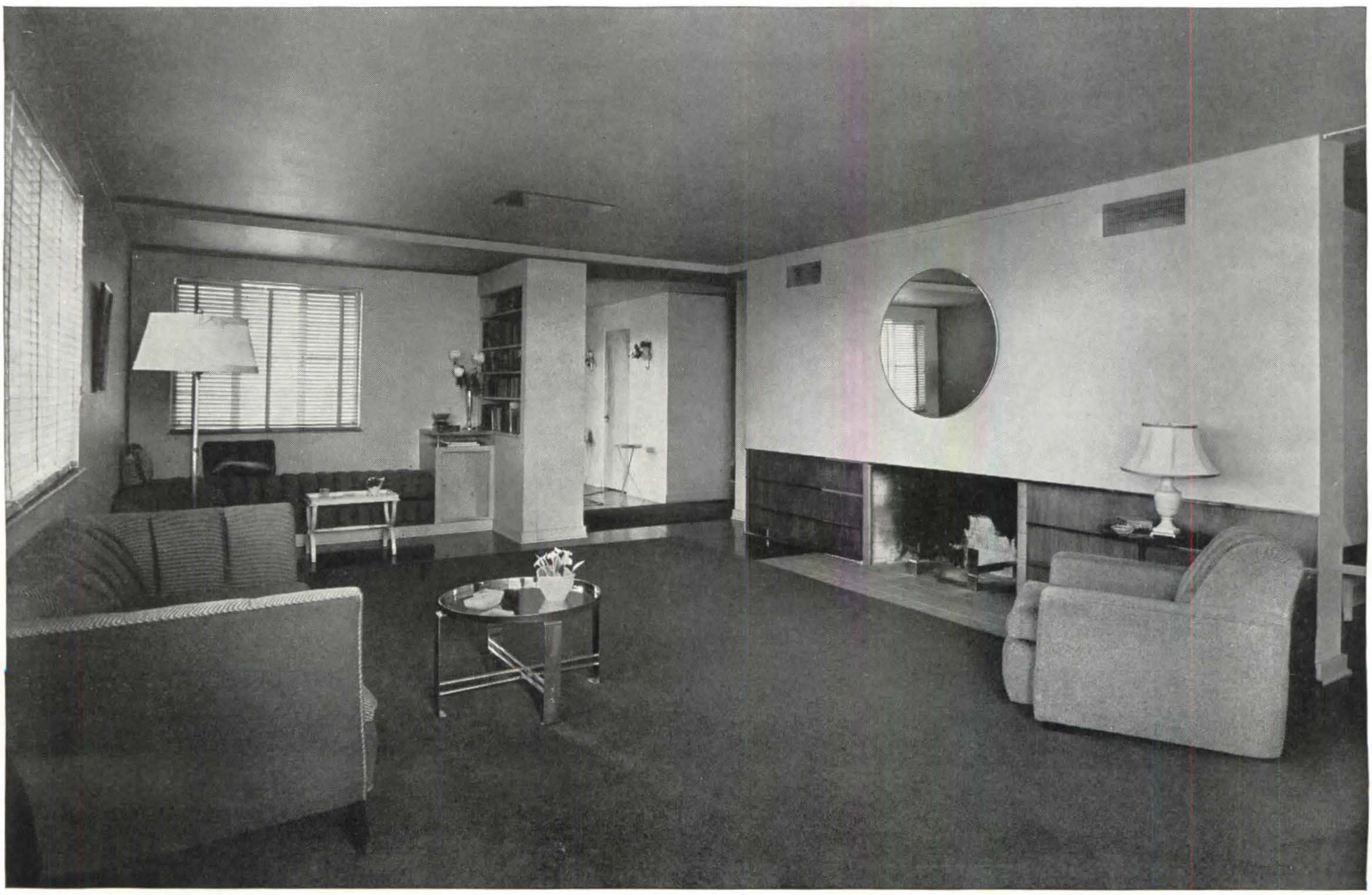
Willard D. Morgan

Designers are beginning to realize that the fireplace, a difficult design problem in the modern house, is best treated as simply as possible. As these examples indicate, this traditional element still has a place in the modern living room, but it is no longer necessarily its focal point.



GEORGE PATTEN SIMONDS, ARCHITECT

C. F. HEGNER, ARCHITECT



Hyskell-Denner