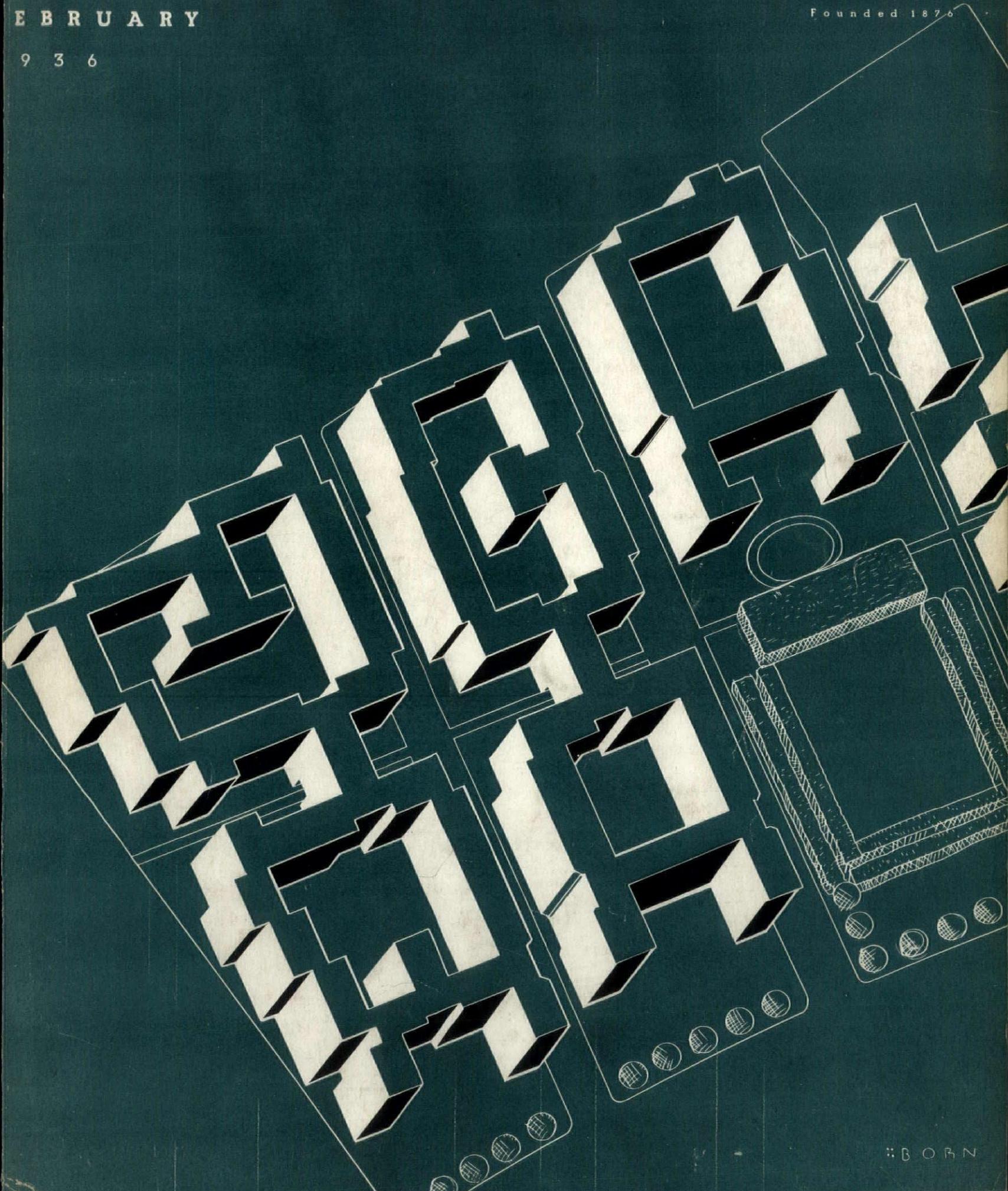


AMERICAN ARCHITECT

FEBRUARY

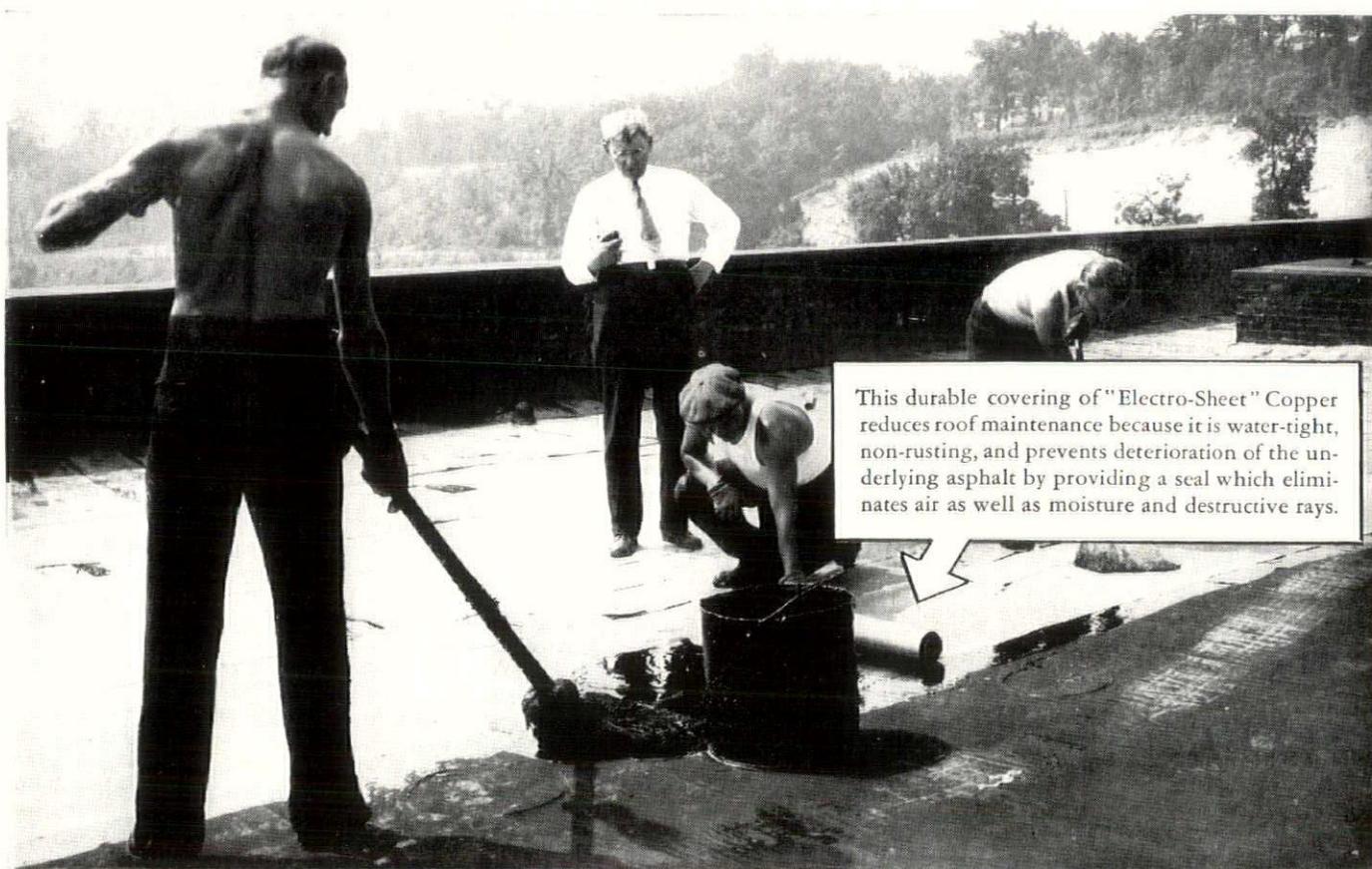
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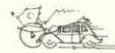
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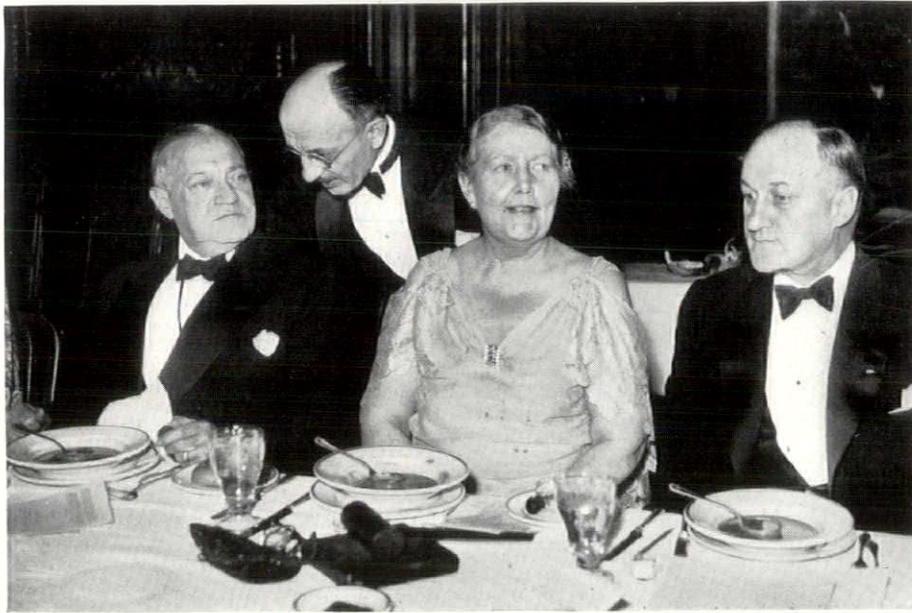


PHOTO: ACME

Federal Housing Authority officials and members of the National Housing Conference met at the White House for tea on January 25, to discuss housing legislation. Left to right: Senator Robert F. Wagner, A. R. Clas, Mary Kingsbury Simkhovitch and Col. Horatio B. Hackett

1935 BUILDING TOTALS

• Instead of the normal, small, seasonal decline usually witnessed in December, the construction permit value for that month in 215 cities rose to \$62,992,039 from \$56,276,588 in November, an increase of 12 per cent, according to Dun & Bradstreet, Inc. With the exception of October, the December figure was the highest since the fall of 1931 and was almost treble the value of permits in December 1934.

Aided by this remarkable upward rush in the final month, the record for 1935 eclipsed all previous years back to 1931, and was 71.3 per cent better than 1934. Following are the statistical analyses by months and by cities:

MONTHLY PERMIT VALUES

	1935	1934	1933
January	\$26,826,268	\$20,825,055	\$17,744,805
February	27,636,367	19,326,964	17,161,943
March	45,063,852	25,505,005	17,798,441
April	51,717,570	29,280,666	22,091,417
May	49,322,110	43,825,268	31,525,523
June	52,672,794	28,621,565	34,098,384
July	54,191,787	33,899,650	29,484,891
August	55,536,546	34,452,738	32,391,868
September	47,479,944	26,567,925	32,243,704
October	66,965,705	37,501,122	26,198,342
November	56,276,588	27,459,066	28,021,688
December	62,992,039	21,125,723	24,915,270
Total	\$596,686,708	\$348,390,747	\$313,676,276

PERMIT VALUES BY CITIES

	— Twelve Months —		Change %
	1935	1934	
New York City...	\$141,397,239	\$82,989,652	+ 70.4
Los Angeles, Calif.	31,672,983	14,591,595	+117.1
Detroit, Mich.	21,222,391	8,836,558	+140.2
Washington, D.C.	21,078,838	9,672,105	+117.9
Chicago, Ill.	12,919,110	7,928,433	+ 63.0
San Francisco, Calif.	12,517,412	7,309,635	+ 71.2
Cincinnati, Ohio	12,309,225	6,151,670	+100.1
St. Louis, Mo.	11,296,533	4,920,791	+129.6

Boston, Mass.	10,914,621	8,413,438	+ 29.7
Baltimore, Md.	9,947,460	9,976,776	— 0.3
Oakland, Calif.	9,685,368	2,802,136	+245.6
Miami Beach, Fla.	9,486,787	5,478,559	+ 73.2
Philadelphia, Pa.	9,255,150	8,055,240	+ 14.9
Milwaukee, Wis.	7,104,871	2,832,653	+150.8
Houston, Tex.	6,961,391	4,812,420	+ 44.7
Long Beach, Calif.	6,864,188	2,629,670	+161.0

HOUSING AND HOUSES

• Everyone knows that President Roosevelt is trying to work out a low-cost housing program that will meet the needs of families in the \$2500 or lower income group which cannot afford to attempt financing a house that costs more than \$5000. The President has listened to the proposals of Senator Robert F. Wagner, has read the report of the Committee of Economic Recovery, has discussed the subject with the heads of governmental housing agencies. But, as this issue of AMERICAN ARCHITECT goes to press, only two facts seemed certain; that there will be a housing bill submitted at this session of Congress; and that nobody yet can tell how much it will appropriate or for what it will provide.

Thus far, the President has insisted that no one has presented a practicable solution. While Senator Wagner's aim, as well as the administration's, has been to make cheap money available, the White House has been quick to point out that this is only one phase of the problem. The other, and probably the more essential, is to reduce the costs of construction. With this in view, several large industrial firms have been trying to evolve a prefabricated house

that, in mass production, can be manufactured for less than \$5000. But with prefabrication still in the horse and buggy stage, so to speak, there seems to be little likelihood that a solution will be found in this direction.

The Three-Year Plan

• Meantime, the Committee of Economic Recovery, headed by Allie S. Freed, submitted to the President the third report in its series of recommendations on housing. This report, entitled "Methods for Men, Money, Management, and Government," outlines a method of financing the Committee's proposed three-year plan for building 1,500,000 new homes.

First of all, the Committee recommends forming forty large companies capitalized at \$1,000,000. Each unit would have a minimum equity capital of \$250,000. Debenture bonds, at a maximum interest rate of 5 per cent, or 6 per cent preferred stock, underwritten by investment bankers, would make up the difference in capitalization. Any securities not sold by bankers are to be underwritten by the Reconstruction Finance Corporation with the total underwriting approximating \$30,000,000. The only other need for Federal funds is in connection with the suggested second mortgage plan. Here the report recommends that the RFC Mortgage Bank lend the prospective purchaser 10 per cent of the cost of the home, taking a second mortgage therefor. Estimating that 500,000 homes, to be sold for \$3500, will be built each year for the next three years, the annual Federal outlay would be \$175,000,000, plus an additional \$30,000,000 the first year for underwriting.

Money and Mortgages

• Taking for granted, for the moment, that good homes can be built for \$3500, what plan does the Committee have for purchasers? First, the potential purchaser of a \$3500 home would pay 10 per cent, or \$350, in cash down. A lending agency would then put up 80 per cent of the amount as a first mortgage, amounting to \$2800. The RFC Mortgage Bank's second mortgage of 10 per cent would care for the remaining \$350.

Then, the Committee's plan calls for an interest rate of 4½ per cent on the first mortgage. This, plus the principal, would be paid off at the rate of \$17.72 a month—the entire sum to be cleared up at the end of 20 years. Insurance would cost 35 cents a month, taxes

(Continued on Page 4)



Dental Clinic, University of Minnesota, with floors of Armstrong's Linotile in No. 150 Sienna and No. 124 Algerian Black. Installation of 8100 sq. ft. by Architect C. H. Johnston. Armstrong's Architectural Service Bureau offers complete assistance in the use of resilient floor materials.

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Armstrong's LINOTILE FLOORS

American Architect, published monthly by Hearst Magazines Inc., 572 Madison Avenue, New York, N. Y. \$3.00 per year; Canada, \$4.00; Foreign, \$5.00. Entered as second class matter April 5th, 1926, at the Post Office at New York, N. Y., under the act of March 3rd, 1879. Issue 2642, dated February, 1936.

\$7.46, making a total monthly charge of \$25.53.

The second mortgage would be liquidated three years after completion of the 20-year payments. Interest and principal payments, plus insurance and taxes would bring the total monthly charges on the second mortgage to \$24.29. Thus, the home-buying operation would be spread over a 23-year period.

Loans to Locals

• While the President made no comment on the report of the Committee of Economic Recovery, a counter-plan did come from his committee composed of Secretary Ickes, Housing Director Clas, Housing Co-ordinator Grimm, and Senator Wagner. The recommendations of this group, which may have the inside track to the President, revolved on the principle of offering Federal funds to encourage local governments in inaugurating slum clearance projects, and on the principle of giving more liberal Federal insurance to loans. It is proposed, roughly, that Federal grants be offered on a 45-55 basis, with the 55% coming from local agencies. Some planners see Federal appropriations of from \$300,000,000 to \$400,000,000 yearly, which, under this plan, would be more than doubled by local governments.

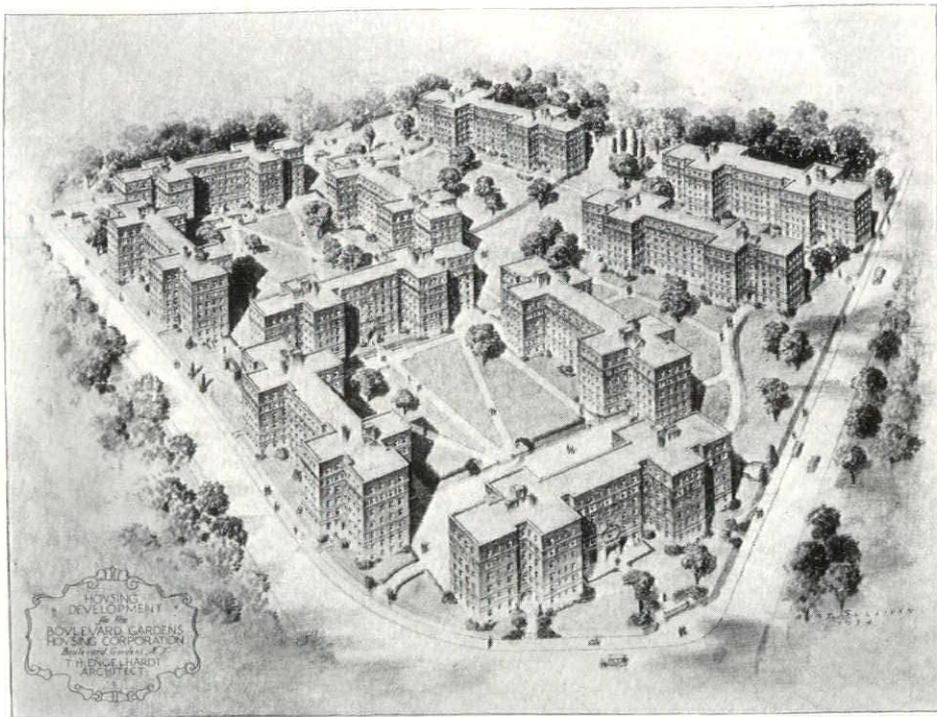
Although this group has used the present Housing Act as a basis on which to work, three important departures are noted:

1. Local governments would be responsible for inaugurating and carrying out the projects;
2. A means test would be applied to renters, so that low cost housing would be available only to those in the lowest income classes.
3. Federal financial aid would really be a subsidy so that rentals could be low enough to reach families in slum areas.

One of Three

• There can be no doubt that housing has become one of Washington's major issues. Summarizing opinion, it appears that three groups, each in disagreement with the other, are campaigning for three distinctly different solutions to the problem of providing 7,500,000 new homes for those in the low income groups.

First, there is the Wagner-Ickes group which believes that Federal subsidy is the only way out. Second, there is the Committee of Economic Recovery's plan which would delegate the problem to private enterprise with a minimum of government assistance.



PWA's Housing "Utopia," Boulevard Gardens, New York. T. H. Engelhardt, Architect

Third, there is the plan sponsored by FHA and FHLB that would extend the present mortgage insurance plan.

Most observers believe that Congress will oppose the Wagner-Ickes plan because it would add to the already large Federal deficit. Senator Wagner and Secretary Ickes, on the other hand, will fight an extension of the present mortgage insurance plan because they believe that it is impossible to reach low income groups in this way. Both of the first two groups will oppose the Committee of Economic Recovery's recommendations because this plan has attempted to create the impression that Federal aid is not needed.

What will happen when Congress gets to this question, nobody knows. But it seems likely that if a choice is made at this session, an extension of the present FHA mortgage insurance plan will be adopted, simply because it has the advantage of stirring up less opposition in a campaign year.

PWA'S UTOPIA

• Whenever anyone criticizes PWA's low rent urban homes, or cites the amazing \$3300 per room cost of the Astor project, the administration's usual answer is to point to New York's Boulevard Gardens as evidence of the success of PWA ventures. For Boulevard Gardens has always been jam-packed with tenants, and, in fact, was 80 per cent rented from blueprints. When the project was announced there

were 8,147 inquiries from prospective tenants, and only 958 apartments to rent. Rentals range from \$28 to \$63.75 per month, an average of \$11 a room.

Every effort was made to make Boulevard Gardens a "handpicked" community. Investigating services made inquiries about the history of each tenant. Applicants whose incomes were less than four times the rent were looked upon as poor risks.

And since occupancy PWA has spared no effort to make Boulevard Gardens into a self-contained community—"one big happy family." A playground 87 by 125 feet has been equipped with modern play devices for children. Recreation rooms and workshops have been fitted out in basements. Contract bridge tournaments, forums for discussing current events, classes in cooking, sewing, child care, first aid—all are part and parcel of living in Boulevard Gardens in the borough of Queens.

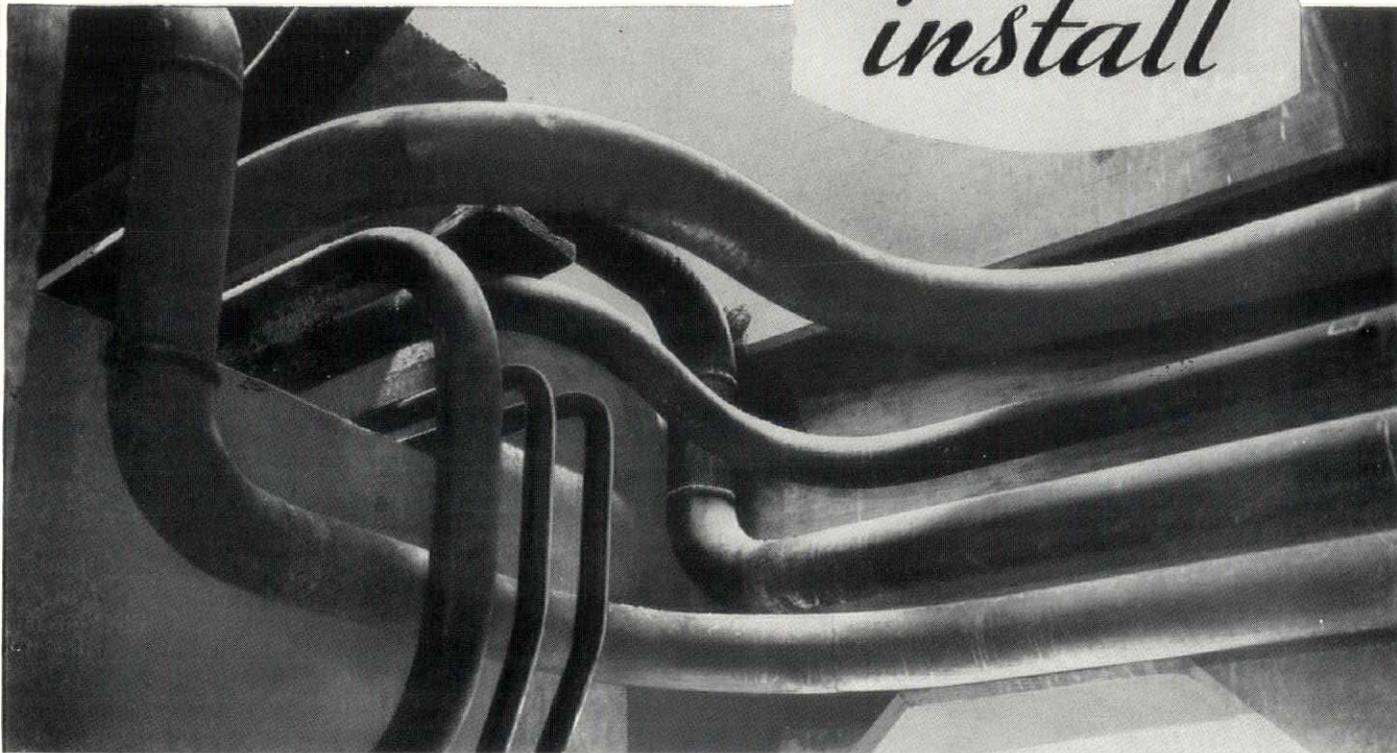
This project was built under the first PWA slum-clearance and low rent housing policy, that of advancing loans to responsible private corporations whose dividends were limited and whose plans guaranteed reasonable rentals.

WORKS BUDGET

• President Roosevelt often has said that the nation should support an annual expenditure of \$500,000,000 for planned public works. And, looking at

(Continued on Page 6)

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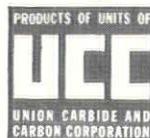
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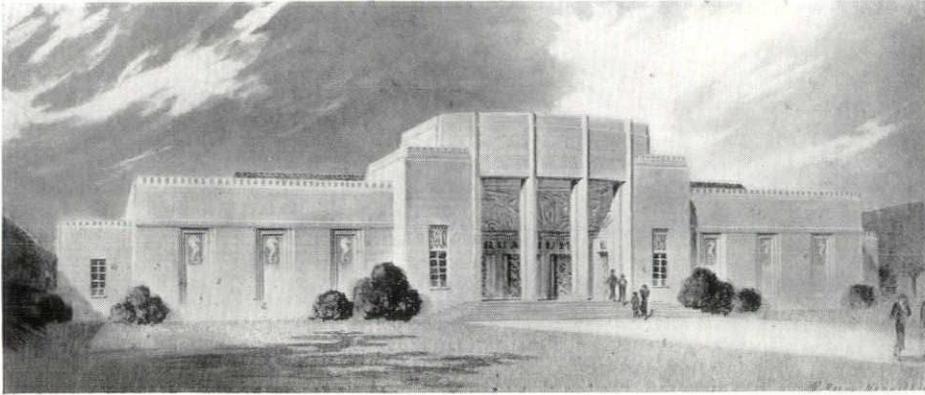
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FROM



LINDE

UNION CARBIDE



An aquarium costing \$150,000 will be a feature of the Civic Center section of the Texas Centennial Exposition to be opened in Dallas on June 6

the 1937 budget that the President submitted to Congress recently, it is evident that he meant just what he said. The public works program, under the terms of the budget, will receive \$404,960,000.

Large as this amount may seem, it is \$333,000,000 less than the total amount made available in 1936 for such projects. Besides, since \$228,000,000 will be transferred from previous emergency appropriations to carry on works already under way, the new appropriation actually will be only \$187,000,000.

With the presentation of the budget the status of PWA has been clarified beyond contention. Since there is no new money for continuing the program of local public works by grants and loans to cities, since there is nothing for low-cost housing, it is apparent that PWA will be liquidated.

WPA, on the other hand, seems destined to outlive its sister agency PWA. Although an estimate of funds needed to carry on the relief works program in 1937 was not presented in this budget, the President has announced that he expects WPA to carry the entire work relief program in 1937 and that he will present his estimate to Congress well before that body adjourns.

RESETTLEMENT ENJOINED

• Residents of Franklin township, Somerset County, N. J., have had plenty to talk about during the last month. For Rexford Tugwell's Resettlement Administration has been attempting to purchase land for a \$6,000,000 greenbelt project in Franklin township, and the local citizenry has been bent on stopping it. Thus far the citizens have done exactly that.

On January 9th the Federal Court of Appeals, Washington, D. C., granted a temporary injunction prohibiting the Rural Resettlement Administration from continuing land purchases for its proj-

ect in Franklin township, and enjoining the administration from making binding options or taking deeds on property. The court also set February 3rd as the date for a hearing on the application for a permanent injunction. Principle objection of the township to RRA is the belief that the 3500 people who would be added to the population by Tugwell's 750 homes would distort the present equitable tax rate.

Acre-homes, \$500 down

• Meanwhile, work on another Tugwell town near Hightstown, N. J., crept along at a snail's pace. But, although balked by snow and cold weather, there was no evidence that residents in this section would force work delays by seeking an injunction, despite the fact that they appear to like the addition of so much tax-exempt land no better than their Franklin township cousins.

The present indication is that the 200 concrete, air conditioned structures will be completed well before the September 1st deadline. Besides these homes, a community center, consisting of two community buildings, a modern school, and modernistic shops and stores, is included in the project. Original plans of the administration called, in addition, for a garment factory where inhabitants could earn enough money to care for needs that only cash could supply. While no announcement has been made as to what form of industry would occupy this building, now that the garment factory plan has fallen through, it is definitely known that some forms of work, other than the community dairy and poultry farms, will be provided.

Each of the homesteaders will get an acre of land along with his home. A cash down payment of \$500 is required, the balance to be paid to the government in monthly installments over a period of years.

AK-SAR-BEN

• Right now, when Professor Tugwell is all wrapped up in his New Jersey scrap, seems to be an excellent time to tell the story of an earlier adventure in rural rehabilitation conducted under the banner of FERA. It concerns a pint-sized project—it cost only \$250,000—situated 20 miles from Omaha, Nebraska, on the flat, bottom land of the Platte River.

According to the facts reported recently by the Kansas City Star, the Ak-Sar-Ben village, colorful name given to the project, was to have been a "dream city." There are 38 lovely homesteads on the site, each sitting on its seven-acre individual tract. There is material on hand for as many more. And not a soul has occupied a single one of the houses. Unfortunately, it can't even be called a "deserted" village, because no one ever lived there.

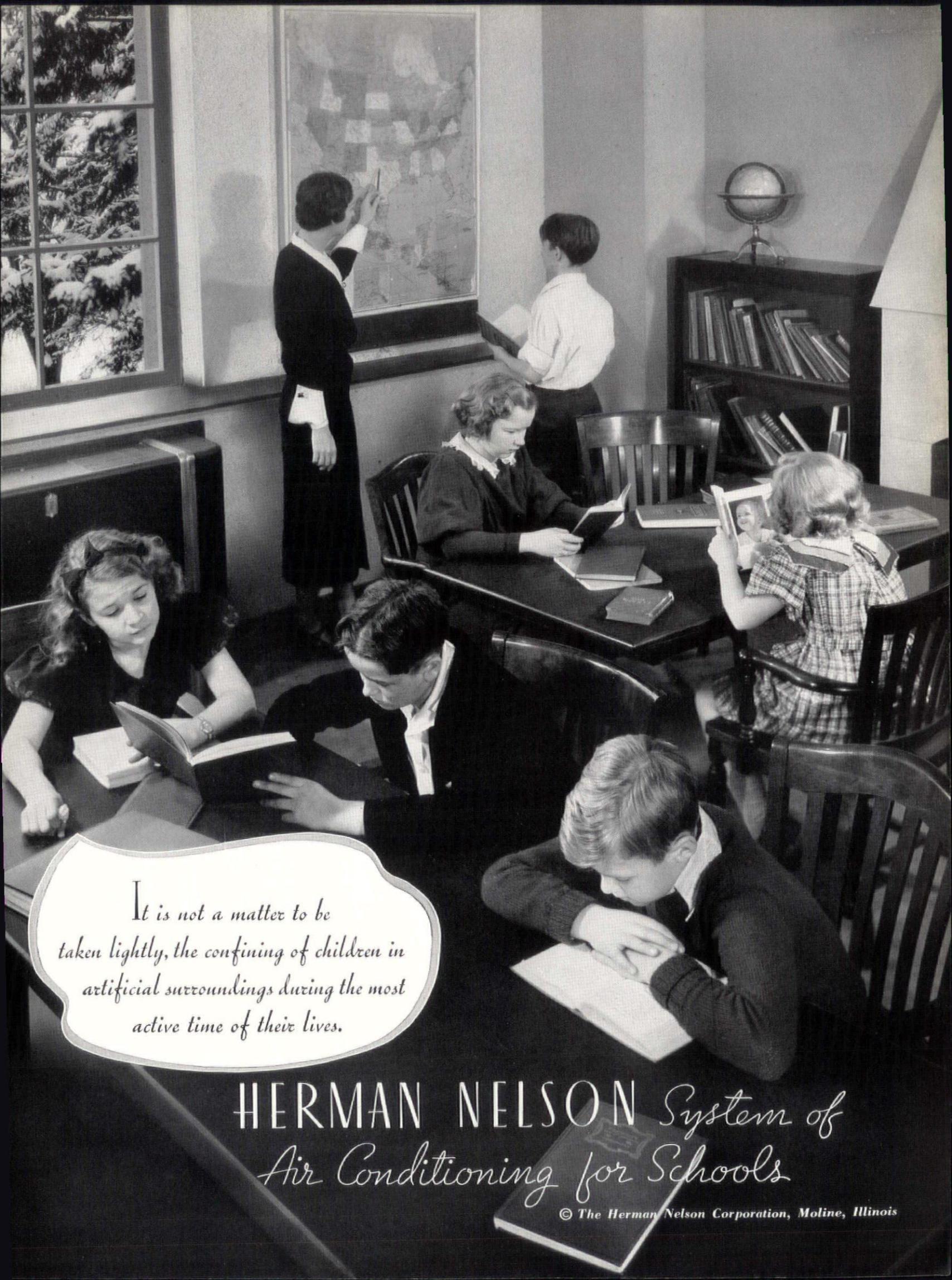
While \$250,000 and 38 houses are only drops in the bucket to Professor Tugwell, with his federal allowance of \$275,000,000, it would seem that it will take the combined efforts of his 12,000 federal employees to find 38 families willing to live in a village with an Arabic name located on a muddy Nebraska river. Possibly after a winter in Alaska the hardy pioneers that were "resettled" there will be willing to take a chance even in Ak-Sar-Ben.

FHLB COST ANALYSIS

• What is the difference in the cost of small house construction in the various sections of the U. S.? That is a question that architects, appraisers, contractors, and bankers have long pondered, and now it appears that at last there will be a definite answer. With this issue AMERICAN ARCHITECT begins publication of the actual costs of building the same typical house in 27 major cities [see cost table at end of this article] the statistics being the result of a survey conducted by the Federal Home Loan Bank Board. There will be forty more reporting cities in the next two months, and, thereafter, each city will report four times a year, affording an accurate index to the trend in home building costs in 67 widely separated localities.

To assure the accuracy of its information, FHLB first of all recruited an army of trained investigators from HOLC. Second, FHLB outlined its specifications for the typical house. The house is a detached home of 24,000 cubic feet volume, of good design, containing a living room, lavatory, dining room, and kitchen on the first floor, and three

(Continued on Page 8)



It is not a matter to be taken lightly, the confining of children in artificial surroundings during the most active time of their lives.

HERMAN NELSON *System of Air Conditioning for Schools*

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TRENDS

NEWS • EVENTS • FACTS • FACES • IDEAS • OPINIONS • COMMENTS

bedrooms and bath on the second. There is an open attic that may be used for storage or finished into one or two usable rooms. There is a basement without partitions, housing the heating plant and laundry facilities.

The exterior treatment is assumed to be a combination of wideboard siding, with brick and stucco as features of design. A one car attached garage is included. Other assumptions of the specifications are that the plot is level, material and workmanship standard, and that the design is sufficient to meet all reasonable requirements of municipal building codes. Unusual materials or practices have been purposely avoided. FHLB estimates that the home might be placed in the \$6000 class.

Procedure

• An exact specification of quality and quantity of the material required for such a house is sent to each investigator. Each obtains current delivered prices on these listed materials from leading local dealers. Likewise, the prevailing local hourly rate for each of the principal trades involved in the construction is reported.

The statistical analysis of the four FHLB districts, divided by sections and cities, follows:

Federal Home Loan Bank Districts, States and Cities	Total Cost	Cost per Cubic Foot
No. 1—Boston:		
CONNECTICUT:		
Hartford	\$5,846	\$0.244
MAINE:		
Portland	4,813	.200
MASSACHUSETTS:		
Boston	5,861	.244
Springfield	5,963	.224
NEW HAMPSHIRE:		
Manchester	5,380	.224
RHODE ISLAND:		
Providence	6,442	.268
VERMONT:		
Rutland	5,507	.229
District Average	\$5,696	\$.237
No. 4—Winston-Salem:		
ALABAMA:		
Birmingham	\$5,456	\$.227
Montgomery	4,359	.181
DISTRICT OF COLUMBIA:		
Washington	4,977	.207
FLORIDA:		
Pensacola	5,095	.212
West Palm Beach	5,911	.246
GEORGIA:		
Atlanta	5,367	.223
MARYLAND:		
Baltimore	5,028	.209
Cumberland	6,033	.251
NORTH CAROLINA:		
Asheville	4,960	.206
Raleigh	5,056	.210
SOUTH CAROLINA:		
Columbia	4,337	.180
VIRGINIA:		
Richmond	5,046	.210
Roanoke	4,508	.187
District Average	\$5,087	\$.211
No. 7—Chicago:		
ILLINOIS:		
Chicago	\$6,361	\$.265
Springfield	6,202	.258
WISCONSIN:		
Oshkosh	5,703	.237
District Average	\$6,088	\$.253
No. 10—Topeka:		
COLORADO:		
Colorado Springs	\$5,972	\$.249
KANSAS:		
Wichita	5,386	.224
NEBRASKA:		



The center of interest at the Baltimore Home Show was the model house, shown in back of the Federal Housing Administration's "Talking Towers"

Omaha	5,487	.228
OKLAHOMA:		
Oklahoma City	5,756	.239
District Average	\$5,650	\$.235

The combined labor and materials cost is assumed to be the "builder's cost" for the house. To this total is added a fixed amount to cover the overhead items—public liability and workmen's compensation insurance, and equipment charge—and then a profit item of 10 per cent is added to the whole. This, FHLB thinks, provides a reasonable "builder's estimate" on the house.

Results for January, coming from 19 States and the District of Columbia, representing a poll of 27 cities, show a surprising variance. Lowest cost for the house—\$4,337, or 18 cents a cubic foot,—was reported from Columbia, S. C. And from this low, costs on the same house vary upwards through a range of more than \$2000 to a high of \$6442 or 26.8 a cubic foot in Providence.

Looking at the picture in its sectional aspects, as represented by Federal Home Loan Bank districts, a group of states in the Winston-Salem bank district reported the lowest average cost, 21.1 cents per cubic foot. The highest figure came from two states in the Chicago District, 25.3 cents.

LOW COST PLAN SERVICE?

• To protect prospective home owners from the hazards of excessive cost and jerry building, the Federal Home Loan Bank Board has offered to make available, to its 3460 members institu-

tions, a home building service plan. The plan would bring to home builders, seeking mortgage loans from member institutions, a wide variety of architectural designs, approved specifications, and technical advice in securing bids.

Through the American Institute of Architects, the architects as a profession already have endorsed the idea of a home-building service plan, and have offered to serve the home-owner borrower, through the home-financing institutions, at a fee commensurate with the cost of a moderately priced house. Far from putting the financing institution into competition with, or in control of the architect, FHLB points out, the plan facilitates the co-operation of these elements.

Member institutions under the plan, would reimburse the Board for the small cost involved, which in turn would be assumed by the home owners desiring to use the service. FHLB will undertake the preparation of this service only if a sufficient number of members indicate a desire to adopt the service.

TALKING TOWERS OF NHS

• Scarcely had the last spectator filed out of Baltimore's new Fifth Regiment Armory last month before FHA had begun to "point with pride" to the success of the first of the National Home Shows. And there was ample reason for FHA to be proud of its work. Approximately fifty thousand people had

(Continued on page 10)

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A RESULT OF 70 YEARS OF AIR ENGINEERING EXPERIENCE



Leaders talk it over after a concerted plea via radio for national co-ordination of the building industry. Left to right: Lewis H. Brown, President of Johns-Manville, the sponsor; Stewart McDonald, of FHA; Stephen F. Voorhees, President of the A.I.A.

paid admission to the Baltimore show, exhibitors had said they were pleased with sales and prospects for sales, the \$6000 model home had been sold before the week was half over—these results without ballyhoo, entertainment or midway.

More important, thought FHA, was the possibility that a million dollars worth of insured mortgages might result from the week's work.

WPA ATTACKED

• Ever since the inception of WPA, contractors have maintained steadfastly that, because of failure to administer the law properly, WPA is the contractor's toughest competitor. Specifically, contractors charge that men are employed directly by the government to do work that private enterprise is adequately prepared to do. Contractors want WPA work on a contractual basis. They want the jobs.

The contractor's contentions always have been based on Section 8 of the joint congressional resolution, which reads: "Wherever practicable in carrying out the provisions of this joint resolution, full advantage shall be taken of facilities of private enterprise." Contractors believe, and have protested, that WPA's force account system is a violation of this point in the congressional regulation.

Because many of the present building jobs in New York City are those originating under the \$50,000,000 WPA program, a good many of the protests against the administration have come from Manhattan. One of the most vigorous of these attacks was launched last month by Christian G. Norman,

Chairman of the Board of Governors of the Building Trades Employers Association in a letter to Administrator Hopkins.

Briefly, he pointed out that WPA construction work is being done in open violation of the law that authorized it, that the force account system is expensive, inefficient and results in poor work at treble or even quadruple the ordinary cost, that building trades employers in New York City cannot absorb relief people because WPA competes too directly with private enterprise.

Just what Mr. Hopkins reply will be is not known. But in the past it has been his practice to answer similar protests by saying: "The majority of the projects in which members of your group would be interested will be carried on under contract."

CANADIAN HOUSING

• Pats on the back for the National Housing Administration have been exceedingly rare. Consequently when Canada, in its recent Dominion Housing Act, adopted most of the best features of the NHA, American housing administrators might well have stood up to say "We told you so."

Like the NHA, the Dominion Housing Act, with its \$10,000,000 appropriation, plans to stimulate home construction through regular financial channels, and to promote 80 per cent loans that will be amortized over a 20-year period. Also, as in this country, the amortization payments will include interest and taxes.

Two important differences between the NHA and the Dominion Housing

Act are noted: first, by supplying Government funds at 3 per cent, the maximum overall interest rate to Canadians will be 5 per cent; second, the Dominion law substitutes mortgages drawn by the lending institution and backed by the Crown, for our more roundabout mutual mortgage system.

MILWAUKEE'S TOWNS-LAND PLAN

• What to do with tax delinquent land has long been one of the most troublesome problems that cities have faced. Recently the common council of Milwaukee proposed one solution that combines good delinquent land usage and good housing practice with government aid.

Knowing that they would shortly come into possession of about 7,000 plotted lots, the council proposed to select two purely residential areas of about 500 to 800 lots, and to adequately zone these to prevent their becoming blighted areas. On each of these lots the city would erect a cottage ranging in value from \$3500 to \$5000. To finance this building the council voted to ask the Federal government for a loan similar to loans negotiated by various national banks. Were the government to grant Milwaukee's request, the city would issue twenty-year serial bonds to the Federal government in return for municipal national currency.

Further, the city would function as landlord, collecting rent in lieu of taxes. Each home would be leased to single families on the 99-year plan so that tenants would be assured of the permanence of the home from one generation to the next. All rents collected would be remitted to the United States Treasury for redemption of the currency, except retention of that part needed by the city to cover the cost of maintenance and supervision.

RADIOED ADVICE

• To co-ordinate all of the branches of the building industry for the sale of more and better homes, Johns-Manville, manufacturer of building materials, sponsored a nationwide radio forum of the leaders of the industry the middle of last month. Speakers on the broadcast included Stewart McDonald, FHA Administrator, Robert V. Fleming, President American Bankers' Association, George LaPointe, Jr., President National Retail Lumber Dealers' Association, Stephen F. Voorhees, President The American Institute of Architects, Lewis H. Brown, President of Johns-Manville, and Harold Nelson, Contractor.

(Continued on Page 12)

Why architects are interested in elevator maintenance

WHEN you buy bricks and stone for a building, that is all there is to it; but when buying an elevator you are buying future service as well as present materials. What will result in the way of such service is one of the most important points to be considered when buying equipment. Only first-class equipment can give good service, and only first-class maintenance can keep such equipment at its maximum efficiency.

Architects often do not realize that they also are vitally interested in such elevator maintenance, and that their interests do not cease with the purchase of the equipment. They desire their buildings to remain a credit to them, and this can only be true if all the operating equipment, as well as the actual construction materials, stands up to the test of time, and is

capable of service as good, after twenty or thirty years, as when installed.

Otis Maintenance Service is designed for the purpose of keeping Otis Elevators at their point of highest efficiency and eliminating breakdowns and minor repairs by expert examination and care. This service is more than inspection by a trained mechanic. It is backed up by the entire organization of the manufacturer, who surely is best qualified to take proper care of his equipment. This service is available at reasonable fixed monthly rates and enables owners and tenants to budget their elevator operating cost.

It is to the architect's interest to have his client purchase elevator equipment that can be assured of manufacturer's maintenance, resulting in lasting service of the highest quality.

BUY OTIS ELEVATORS WITH OTIS MAINTENANCE

OTIS ELEVATOR COMPANY

CONSULT OUR NEAREST OFFICE

Said Mr. Voorhees, speaking for the architects: "The thing that is needed most is for the public to be informed as to what the architect can give them today in terms of 1936 values. The architect is primarily the designer but as an essential service in realizing the design, he selects and describes the materials and supervises the construction for conformance with the design. These services must be rendered in connection with every house and they are performed by some one but not always by an architect. The man who is trained for these services—the architect—is certainly the one best qualified to render them."

TOWARD MORTGAGE UNITY

• Four trustee institutions—insurance companies, savings banks, trust companies, and building and loan associations—control a vast majority of the nation's mortgage lending. And these four have been about as friendly as cats and dogs when mortgage lending policies were being considered. Even now, when the threat of lower mortgage interest rates is an ever present bugaboo, the big four are anything but a concerted force.

Some time ago, while the U. S. Building and Loan League was in convention at Cincinnati, it appeared that these four agencies were making an attempt to get together. Speaking unofficially for the life insurance companies, R. Graeme Smith, an executive of the Connecticut General Life Insurance Company, advised unity and named four subjects that should be studied. They were:

1. Research work on city planning, prefabrication, and obsolescence of present structures;
2. Possibilities of an agreement concerning minimum standards of construction qualified for mortgage credit;
3. Costs of title search and delays in real estate transactions;
4. Opinions as to when and how government agencies should supplement private trustee institutions.

Possibly more far reaching than any of these principles were Mr. Smith's further recommendations for periodic representative meetings of the four groups, and for a trade paper covering all parts of real estate financing.

It remains to be seen, of course, just how far this step will be carried. The threat of cheap government money may bring the big four together. On the other hand, the continued growth and return to greater earnings of the building and loan associations may make their attitude one of greater independ-

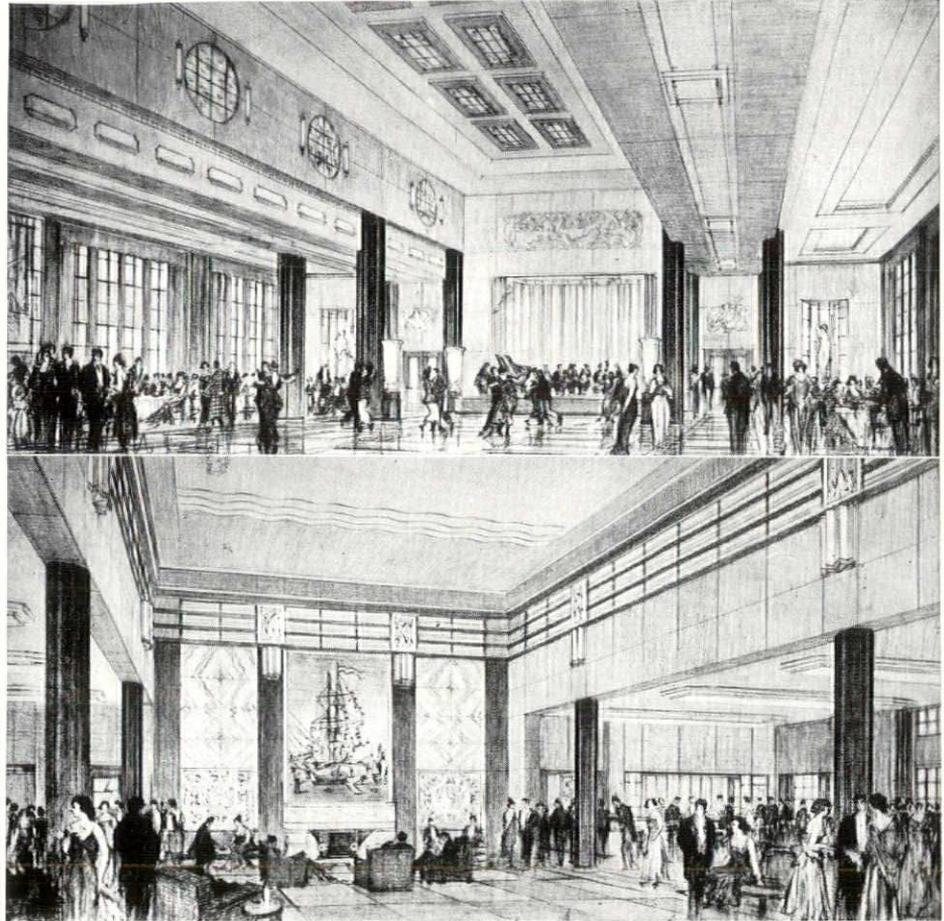


PHOTO: ASSOCIATED PRESS

The Queen Mary, England's largest and most luxurious liner nears completion. Illustration at top shows the lounge, and below is the smoking room. Mewes and Davis, Architects

ence. When 11,000 building and loan associations disburse a total of \$462,000,000 as they did in 1935, when their surplus and undivided profits increased from 4.27 per cent in 1932 to 13.3 in 1935, it is doubtful that they will receive applications for greater unity with any great cordiality.

WHAT PRICE R. E. BONDS?

• While not so rapid as the recovery of the building industry, the advance in the average value of real estate bonds is no less heartening. Real estate bond prices, according to a survey of 200 typical eastern issues by Amott, Baker & Co., Inc., made an average gain of 108 per cent during the three year period which ended December 31, 1935.

Biggest gain of the period, 220.9 per cent, was made by real estate bonds on housekeeping apartments, while the second largest appreciation, 197.5 per cent, was registered on issues with theatres as the underlying security. Even with this increase, however, the average market price per \$1000 face value of bond issues on housekeeping apartments was only \$353—on theatres, \$592.

Of the five cities represented in the compilation Pittsburgh had the best record for 1935 and for the three-year period. Prices there advanced 197.8 per cent during the three years and 86.9 per cent in 1935. Results of the survey are reprinted below:

Type of Security	% Increase 1935	% Increase 3-Year Period	Present Avg. Value per \$1,000
Housekeeping Apts.	54.8	220.9	\$353
Apartment Hotels..	51.4	192	327
Theatres	41.3	197.5	592
Hotels	28.3	74.9	313
Office Buildings....	23.3	72.2	439

City	% Increase 1935	% Increase 3-Year Period	Present Avg. Value per \$1,000
Pittsburgh	86.9	197.8	\$271
Buffalo	33.1	98.1	414
New York	33	122.7	383
Philadelphia	28.7	43.8	345
Boston	11.3	49	523

NEW G-E HOME BUREAU

Carl M. Snyder has been named manager of a new General Electric home bureau, formed to co-ordinate more effectively services for the benefit of architects and prospective home builders. The new department, located in the G-E building in New York City, will furnish an advisory service on specifications to anyone wishing it.

Alpena County Courthouse, Alpena, Michigan. Wm. H. Kuni, architect. Henry C. Weber Construction Co., Bay City, contractor. M. D. Cooley, state engineer for PWA. Emil Schiebel, project engineer.



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ARCHITECTURAL CONCRETE was chosen for Alpena Courthouse because it lends itself naturally and gracefully to a distinguished design; because it is firesafe, weather-defying and maintenance-free—and because cost of construction was lower than with other materials under consideration.

Not only is this building designed to withstand the rigors of many, many winters in Northern Michigan, but the placing of its concrete was actually carried on throughout the winter months.

Alpena Courthouse is one of many score of important buildings east of the Rockies designed in Architectural Concrete in 1935. This acceptance, accelerating so

rapidly after years of service-testing in every climate, indicates that Architectural Concrete is one of the most important forward steps in modern building construction.

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- "Beauty in Walls of Architectural Concrete."
 Concrete Information Sheets (AC series, 1 to 12).

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City..... State.....



TWO SIMULTANEOUS ARCHITECTURAL COMPETITIONS
for designs of
FIRESAFE CONCRETE HOUSES

AUTHORIZED BY PENCIL POINTS

SPONSORED BY THE PORTLAND CEMENT ASSOCIATION

This Competition closes at 8 P. M., Standard Time, Monday, March 9, 1936. For complete details write to Russell F. Whitehead, A. I. A., Professional Advisor, 330 West 42nd Street, New York, N. Y.

THE Portland Cement Association believes that the trend toward permanent firesafe houses will continue because of its economic soundness. True low costs are obtainable only through permanence.

Growing acceptance of this idea offers the architectural profession the greatest opportunity it has ever had in the housing field. When people think of their new home as something

that will last for generations, problems of layout, style and detail take on new importance. The permanent house needs the touch of the architect if its beauty is to survive current modes and last with the physical structure.

For these reasons, the Portland Cement Association welcomes the opportunity of sponsoring the 1936 Pencil Points competitions for designs of firesafe concrete houses. It believes that the trend

toward better construction will be lasting if strongly influenced by the architectural profession.

There have been numerous recent developments in the use of concrete for houses. The competitor need not confine himself to more familiar types of construction, but is welcome to use any sound design for concrete floors, walls or roofs. An extra stimulus is thus provided for refreshing the knowledge of this important building material.

It is hoped that the results of this competition will show the home buyer in modest circum-

stances that the architecturally trained man can solve his small house problem from the practical as well as the esthetic point of view.

The Portland Cement Association is emphatically not in the business of selling or furnishing plans. While the Association intends to publicize the designs widely, those who inquire for detailed plans will be referred to the architects who furnished the designs.

Designers who do not have a complete file of literature are invited to write for any of the following free booklets or data sheets:

IT PAYS TO OWN A FIRESAFE HOME—
HERE'S HOW IT'S BUILT
•
CONCRETE MASONRY CONSTRUCTION
•
CONCRETE ASHLAR WALLS
•
PORTLAND CEMENT STUCCO
•
KEY TO FIRESAFE HOMES (FLOORS)
•
HOME GARAGES
•
CONCRETE FLOORS FOR RESIDENCES
•
PRECAST JOIST CONCRETE FLOOR CONSTRUCTION DETAILS
•
REINFORCED CONCRETE HOUSES—CONSTRUCTION DETAILS
•
WALLS THAT WHISPER HAPPY LIVING (ASHLAR)
•
BUILDING WATERTIGHT MASONRY WALLS
•
PAINTING EXPOSED CONCRETE ASHLAR MASONRY WALLS

PORTLAND CEMENT ASSOCIATION

Dept. A2-2, 33 West Grand Avenue, Chicago, Illinois



HILLSIDE HOMES

PWA's first limited dividend housing project provides "a more abundant life" for 1400 New York families; how the needs of the community were analyzed and provisions for better living were made within the limits of a budget calling for rentals of \$11 per room

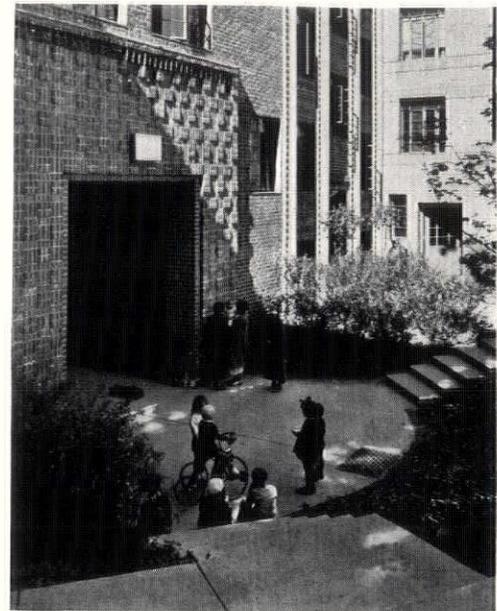
CLARENCE S. STEIN, ARCHITECT

HILLSIDE was conceived from the beginning as a complete integrated community of apartments within the larger framework of the city in which families of limited income might find the setting for what President Roosevelt has called "a more abundant life." We were convinced that to secure this it was not sufficient merely to build spacious, well-lighted and well-ventilated apartments. Nor was it enough to organize the open spaces between the buildings so as to secure broad views of green from every window. Something more was needed. We must plan so as to facilitate the development of a full community life.

This required first of all a site that would spaciously house a group of people large enough to form a community that could develop and preserve its individual character in spite of its surroundings. To give it unity the neighborhood must be centered around common interests such as an adequate play space and community facilities. An attractive site of about seventeen acres of sloping land located next to a school was chosen and the preliminary studies made with a playground as the center feature of the scheme. To make it possible to reach the recreation center conveniently and without danger of crossing a traffic road, it was decided that the "Radburn Idea" of safety should be applied by means of closed streets and a proposed underpass.

PROVIDING COMMUNITY FACILITIES

The basic elements of the physical layout having thus been settled, it was necessary to determine what community facilities and space should be provided in the plans. We wanted to make these as complete as possible. But we were limited by the fact that these advantages must be provided for those who cannot afford to pay more than an average rental of \$11 per room per month and that as far as possible there should be no additional charge for the use of community facilities. Therefore the utmost economy of space



Entrance connecting central courts

and structure was required. We could not afford to erect a separate community building. We were limited to the use of the lowest floor of the apartment buildings.

Basement Uses. But there was much competition for the use of this space. The early cost studies that the builder had made showed that we could not build as spacious apartments on as low ground coverage as we felt essential unless we economized by using a large part of the basement space for apartments. The sloping site of Hillside facilitated the development of a large number of apartments in the basements that would be six inches above the garden courts. By adding private terraces to these, we were able to make them among the most desirable apartments in the development. They take up approximately forty per cent of the basement space. The use of basement space for apartments increases income from rentals but curtails the space for community conveniences and social facilities. Instead of the usual surplus space which in the past has led to waste and haphazard use careful studies of needs and layout were necessary.

Thus the chief problem in planning use of the basement space at Hillside was to set the balance between economy of space and the satisfaction of the needs of the community. The functions to be provided for in basement space are:

1. **Community conveniences** including storage of trunks and perambulators, meter rooms, slop sinks, tenant's work-shops.
2. **Administration and maintenance** of buildings and grounds.
3. **Community social facilities** such as nursery school, assembly rooms, and club rooms.

To reach the balance between economy and adequacy it was necessary to answer three questions:

1. What are the facilities desirable for a neighborhood of 5000 persons?

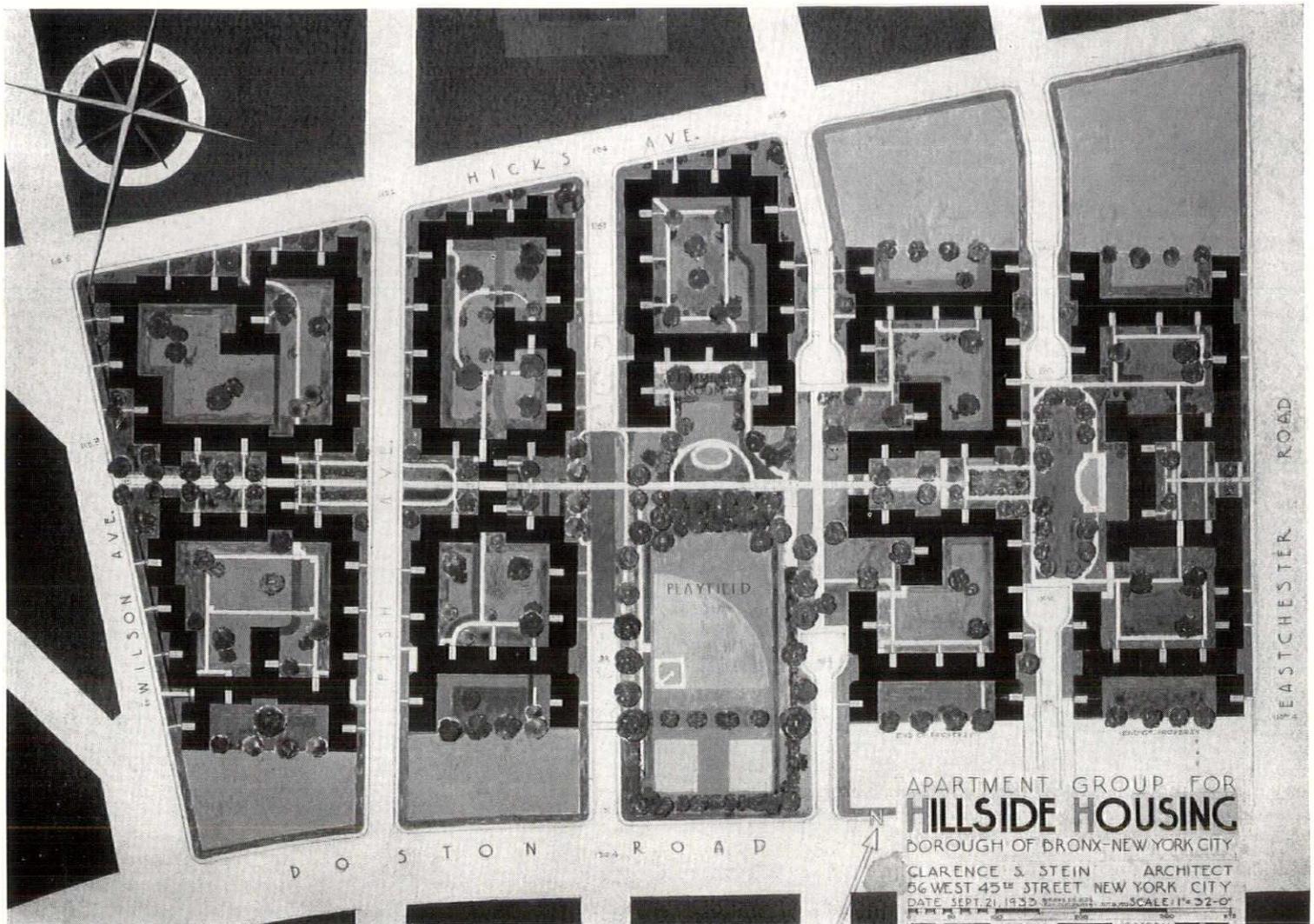
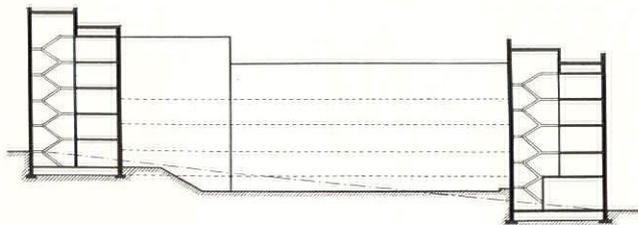


PHOTO: DRYER FROM RENDERING BY J. FLOYD YEWELL

HILLSIDE SITE

The advantages of close co-operation between architect and builder are evident at Hillside. Starrett Brothers and Eken, the general contractors, were associated with the architect on the project from its very inception, and the interchange of ideas, experience and factual data, saved time, money and minimized changes—as well as expediting the work throughout.



Sectional diagram showing how natural slope was used to create garden court apartments at different levels

Hillside Housing is built on the site of an old farm, a previously undeveloped tract. It is bordered by Boston Road, the main traffic artery, on the south; by Hicks Street on the north, and by Eastchester Road on the east. The high point of the site, near the east, is 55 feet above the low point, at the west. This slope was skillfully utilized in the planning to provide a large number of garden apartments at grade levels, using the darker areas for storage, etc.

The original plot, considered in 1932, when an RFC loan was applied for, was 26 acres. Difficulties of closing streets and other planning considerations led to the adoption of the plan here shown. The 100-foot strip along Boston Road was retained by the previous owner, Nathan Straus, Jr., for later commercial development, stores, etc. In September, 1933, a loan not to exceed \$5,060,000 (88.5 per cent of the cost of the project) was approved by PWA, on more advantageous terms than RFC,—4 per cent instead of 5, and longer amortization allowed for fireproof construction.

The type of block plans were developed through a long experience in this type of work, exhaustive research, and innumerable studies of the possibilities of this site. These studies were carried on in three dimensions, as well as by drawings, on an accurate contour-model of the site. An actual four-room apartment was constructed and furnished as part of the study to obtain maximum convenience at minimum cost. Typical apartment plans are shown on page 29. For convenient reference, the salient facts and most interesting statistics have been gathered together in summarized form, page 33.



PHOTOS: SAMUEL GOTTSCHO

2. To what extent are these satisfactorily supplied outside the development and available for the use of the Hillside community?
3. What desirable facilities not supplied elsewhere can be afforded?
 - a. Within the economic limitations of tenants who cannot afford to pay rentals of more than \$11 per room?
 - b. Without the sacrifice of too much space otherwise available for rental?

The first question had to be answered in large part from the experience of other large non-commercial housing developments. The second was met by a survey of the neighborhood to discover available existing community facilities and the terms for using them. The third required a careful study of basement space to determine its most advantageous and economical use, either for living, community, or service purposes. Studies were carried on intermittently during a period of a year and a half while the plans were being developed.

The studies contained: first, a list of those community facilities that should be available to the inhabitants of Hill-

side; second, a survey of those facilities that already existed in the neighborhood; and third, a conclusion as to what facilities should be supplied by Hillside to supplement those already available and at the same time to permit the development of Hillside as a separate integrated community within the larger pattern of the bigger city. We were greatly limited in reaching these conclusions by the fact that we could not tell just what type of tenants would live in Hillside. Nor could we turn for guidance to the one who was to act as leader in the development of the community, as the manager was not appointed until long after the time when it was necessary to decide on plans and construct the buildings. Our studies of maintenance and management were not made in an attempt to dictate the manner in which the community space should be used, but to guide us in arranging spaces so that they would be adequate and could be used to the best advantage, and also that the space and facilities might have as flexible a use as possible.

These studies were made and the reports prepared by Margaret Stein Morgan and Catherine Bauer.

CLARENCE S. STEIN, *Architect*



Youngsters making good use of the gravel play area set aside for them in the court

SUMMARY OF RECOMMENDATIONS ON COMMUNITY CONVENIENCES

NOTE: All recommendations were carried out in accordance with this list. Where the actual provisions vary from the recommendations they are stated in parentheses.

1. PERAMBULATOR STORAGE.
 - a. 10 sq. ft. per family is required. [10.82 sq. ft.]
 - b. Rooms should be reached by ramps.
2. TRUNK AND FURNITURE STORAGE.
 - a. 20 sq. ft. per family is required. [23 sq. ft.]
 - b. Location is not important but rooms must be kept locked and the key kept by the janitor.
3. SCREEN STORAGE.
 - a. Screens are supplied and are stored with trunks or in rooms serving many apartments.
4. LAUNDRIES.
 - a. Racks in bathrooms and roof drying.
5. PORTERS' SINKS.
 - a. One for every stairway.
6. GARDENERS' TOOL ROOMS.
 - a. One for each block.
7. METER ROOMS.
 - a. One for each stairway. [Minimum size 8' x 10'.]
8. INCINERATORS.
 - a. One for each stairway.
9. BOILER ROOMS.
 - a. One for each block.
10. WORKSHOPS AND MAINTENANCE.

[Grouped in one central location, for convenient delivery of materials and efficient supervision.]

 - a. Paint shop and storage—500 sq. ft. [690 sq. ft.]
 - b. Carpenters—500 sq. ft. [460 sq. ft.]
 - c. Electrician—300 sq. ft. [400 sq. ft.]
 - d. Steamfitter, plumber—300 sq. ft. [360 sq. ft.]
 - e. Superintendent's office located near shops. [100 sq. ft.]
 - f. Storage closet and toilets.
 - g. Miscellaneous storage space.
11. TENANTS' WORKSHOPS.
 - a. One or two to a block. [Three of the blocks have two each; two blocks have one each. Each shop has its own toilet and sink.]
12. OFFICES.
 - a. Renting.
 - (1) Temporary office for initial renting period.
 - (2) Permanent office for small staff and filing.
 - b. Managing.
 - (1) Space divided to care for functions of reception and information, general office and filing, cashier's cage, vault, manager's office.

SUMMARY OF RECOMMENDATIONS ON SOCIAL FACILITIES AND COMMUNITY ROOMS

NOTE: All recommendations were carried out in accordance with this list. Where actual provisions vary from the recommendations they are so stated in parentheses.

A. Use of Outside Facilities

1. Public schools and parks conveniently located may be relied on to provide gymnasium, swimming pool, athletic field and large auditorium.

B. Community Facilities to Be Supplied

1. PLAYGROUND.

a. For estimated 900-1,000 children 5-14 years old—average attendance 500-650.

(1) Small children have interior block playgrounds.

(2) Older children and adults may use school and park facilities in the neighborhood.

b. Area of $2\frac{1}{2}$ acres for apparatus, junior baseball, game courts, open play space, shaded areas, small gardens, skating in winter. [1.75 acres]

c. Shelter house with toilets and storage space for equipment.

2. WADING POOLS.

a. Two located in different sections. [Two, one near playground]

3. NURSERY SCHOOL.

a. Attendance limited by expense to probably 50-75 pre-school age children.

b. Need open floor space for indoor play plus kitchen, dining space, toilets, coat room, teachers' office and rest room. [Room 24' x 27' with alcove 21' x 15', and room 28' x 21', plus kitchen, toilets and supervisor's office.]

c. Location with maximum exposure to light and sun within easy walking distance of all apartments; outdoor play space adjoining.

4. PROVISIONS FOR MOTHERS with baby carriages.

a. Spaces in the courts which are sunny and protected.

b. Benches for mothers.

5. COMMUNITY ROOMS.

a. Assembly room to accommodate 250-300 people with small stage, toilets, cloak room, chair storage space.

(1) School auditorium for large meetings.

b. Small club rooms—minimum of 4 rooms.

c. Kitchen serving both the assembly room and club rooms.

d. Tenants' workshops—one or two to a block.

C. Organization and Administration

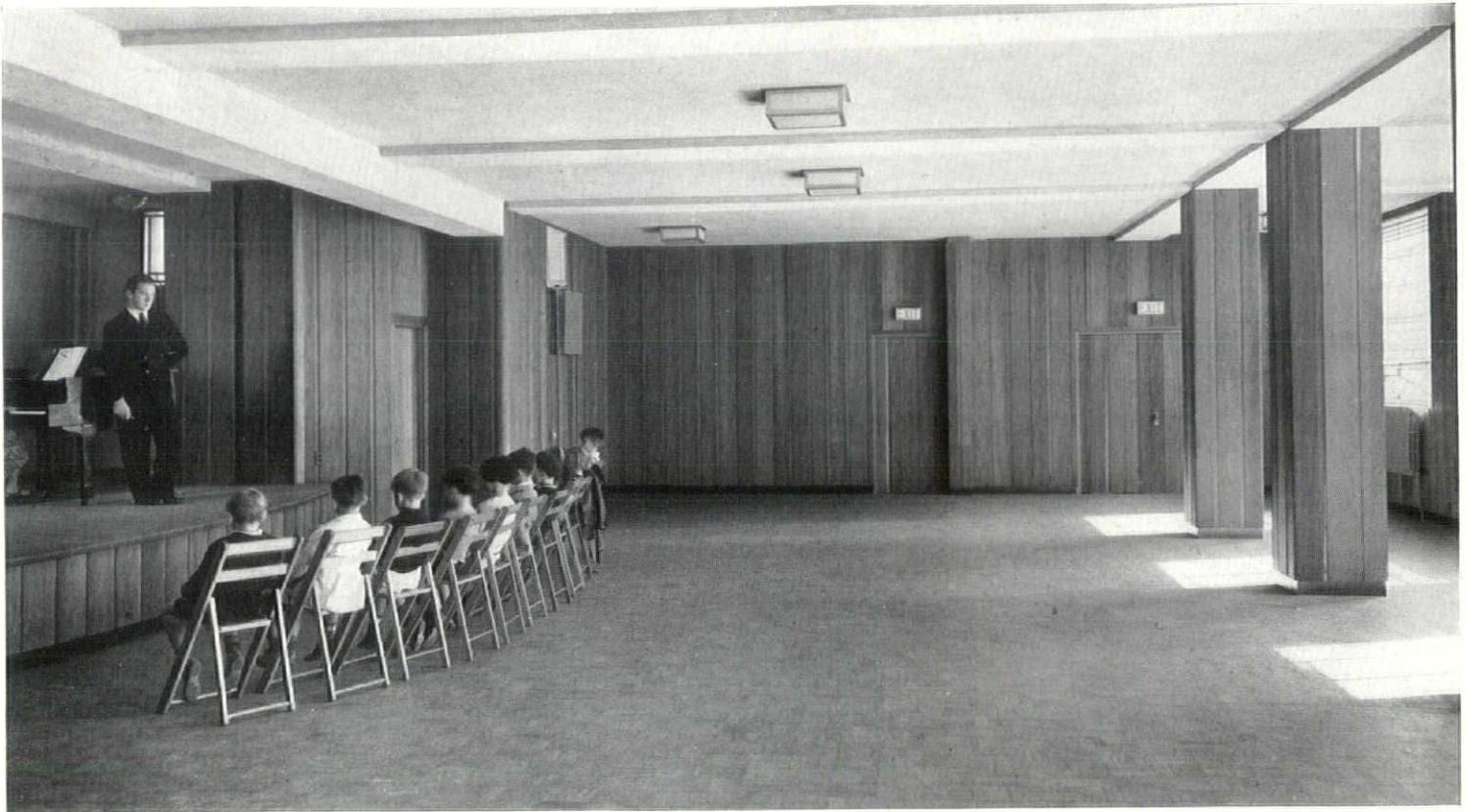
1. Director of community activities with separate office space near the playground.

2. Community rooms left as free as possible for adaptation to tenants' interests.

3. Community rooms maintained as part of the general expense of the development, if possible, otherwise through community dues or specific charges for activities. [Room 30' x 63' with stage-alcove 15' x 30'.]

Story telling in the community nursery school which is near the playground and wading pool



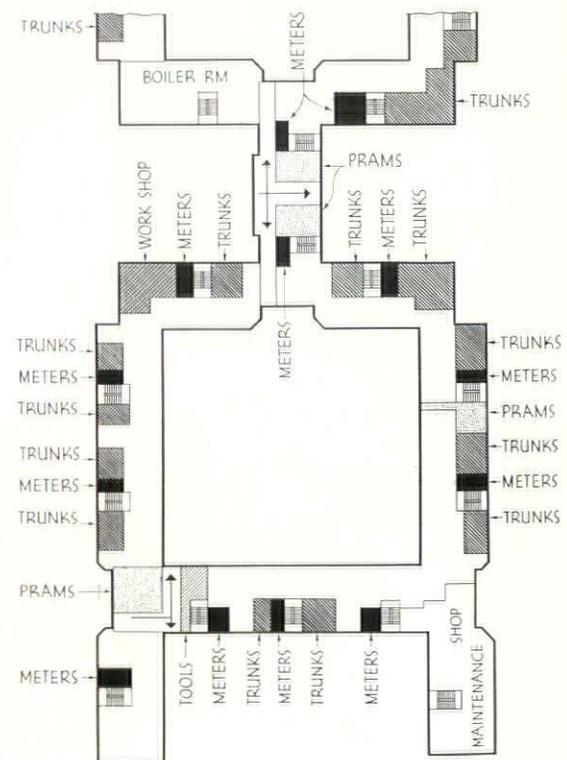


Community meeting hall; finished in redwood, stained and waxed

Typical tenant workshop used by art classes



Diagrammatic plan showing carefully determined and conveniently located basement services. White portions indicate spaces devoted to garden court apartments





A typical apartment entrance showing characteristic brick-work design

HILLSIDE'S COURTS AND LANDSCAPING

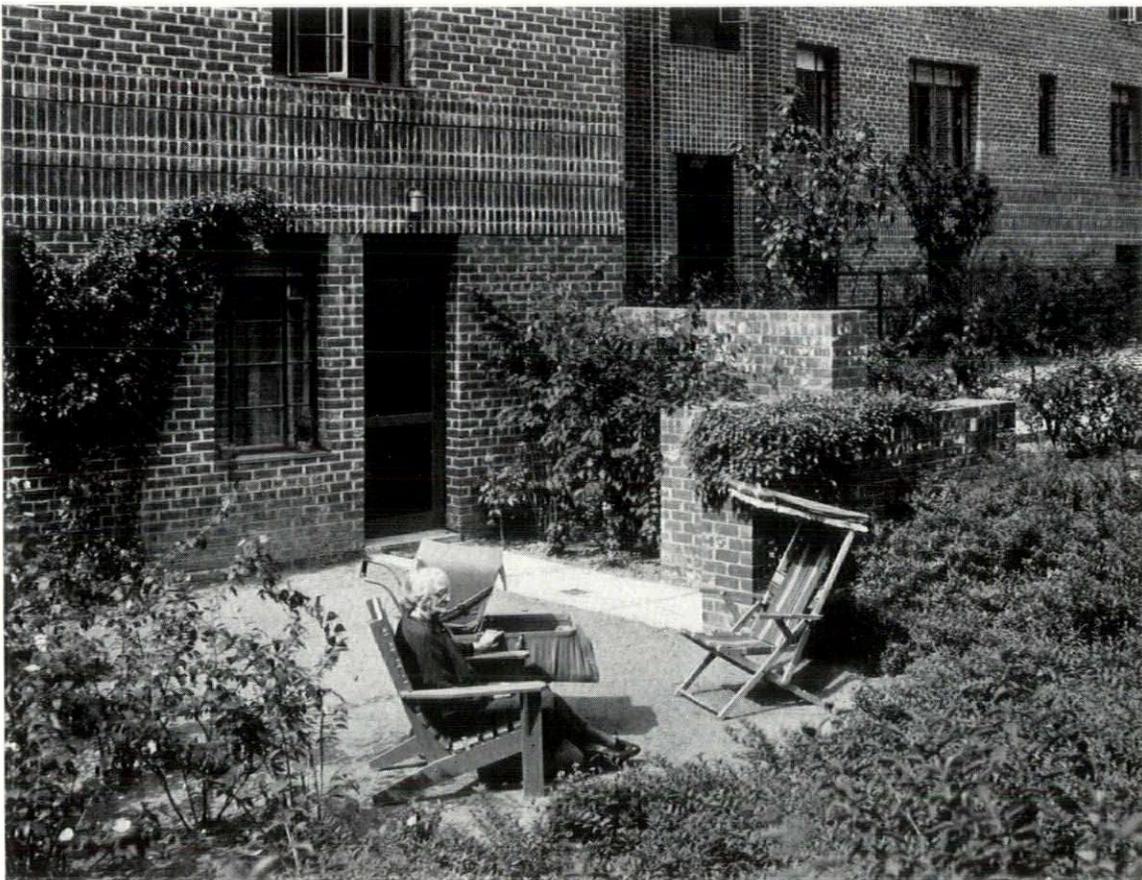
THE spacious open courts and the large number of ground floor apartments, each of which has a private terrace, has made Hillside particularly interesting in its landscape. Each court has its own distinctive planting plan and range of plant materials. The intimate private terraces are protected by flowering hedges from the public walks and are ideal spots for reading, relaxation, gossiping or just sunning. In the court are small play spaces for children of pre-school age who can enjoy themselves under the eyes of watchful mothers at the windows. The large playground is arranged for older children's play and has a convenient shelter and comfort station. The wading pool at the end is popular all year 'round as a play space and forms, with its background of evergreens, a pleasing termination of the playground vista.

The planting at Hillside is of hardy wholesale stock, with replacement guaranteed for the first year. In order to reduce maintenance to a minimum, banks and small irregular areas were planted with ground cover instead of grass.



PHOTO: MAYER

The wading pool is a popular splashing place throughout the summer. It becomes a small velodrome when dry; and, when frozen over may be used for sliding and ice skating



The private terraces which feature the garden court apartments are popular with old and young alike. Each garden court apartment has its private hedged-in terrace as may be seen on the opposite page



The play space for pre-school children is convenient to the terraces and near enough to the apartments, so that mothers may keep watch from windows above





The topography of the site allows enough variation in courts to avoid monotony. In the distance at extreme left may be seen the roof-cage of the public school adjacent to the property



The open courts, flooded with sunshine, are ideal for play and recreation. . . On the opposite page is shown the main entrance to Hillside looking east along the axis of the central courts



THE SOCIAL, RECREATIONAL AND CULTURAL LIFE

The management of Hillside is thoroughly acquainted with the fundamental concepts of the development and is co-operative in carrying them out. Rules are few, simple and for the community welfare. There is a friendly co-operative spirit between tenants and managers and the management scrupulously avoids any paternalistic supervision of the tenants' activities.

Community activities at Hillside range all the way from tap dancing to psychology. All the activities without exception have been inaugurated by the tenants themselves and are supported by them. Miss Louise P. Blackham has been engaged to assist in the educational, social and recreational affairs of Hillside. Through her, arrangements are made for the establishment of classes or for the formation of clubs, since it is, of course, necessary to schedule the uses of the various clubrooms and the community meeting-room. The tenants suggest the activities and enlist Miss Blackham's aid in organizing a group or club. Teachers have been pro-

vided by WPA for art, singing and dancing, and speakers are provided by the Adult Education Division of the New York public schools.

The nursery school has enrolled approximately 100 children of pre-school age. The parents pay a nominal sum each month to provide for two teachers and a nurse. Student assistants are also assigned to this work by Teachers College of Columbia University.

Space is lacking to even enumerate the many group activities in which the tenants are engaged. They vary from purely social clubs, or hobby and handicraft classes, to the cultural societies for the study of music, drama or literature as well as the arts. An athletic association has been formed and has a large membership. The gymnasium of the neighboring school is used as well as the large playground.

The development of the community activity is thus a natural outgrowth of the opportunities presented through facilities provided.

PRACTICAL ASPECTS OF HILLSIDE'S MECHANICAL PLANT

DRAINAGE AND SANITATION

The only sewers in existence adjacent to this property were on local laterals on Hicks Street, Eastchester Road and a southerly trunk sewer on Wilson Avenue. The Bureau of Sewers had a tentative drainage map which indicated the size and depth of sewers for other existing and proposed streets. Since the coverage of the entire plot and the actual placing and requirements of the buildings were known the design was made definite for the conditions. In some cases, buildings located on the uphill side of a block were drained through the buildings on the lower side, thus obtaining considerable economy in plumbing and saving the construction of sewers in parts of some streets. Further economy was obtained by having sewers flow against street grade, with much shorter runs but without overloading the sewers into which these flowed. The sewers were constructed by, and at the expense of the Hillside Housing Corporation. Sewers are of glazed vitrified tile pipe.

The sewer in Boston Road was built on the northerly side of that street in the grass strip between the sidewalk and the property line so as to avoid interference with the subway which is contemplated along Boston Road. The southerly side of Boston Road will have to have its own sewer.

The Engineers of the Bureau of Sewers, Borough of the Bronx, were very co-operative in the matter of approving the sewer plans. As this was a special problem they permitted deviation from the tentative drainage plan. Most of the sewers which were installed were of a larger size and of greater depth than called for on the drainage plan. The design was based on the Bronx rain-curve, and a flow computation diagram was submitted with the plans to the city engineers, who approved them.

A special plot plan for the plumbing contractor showed the detail grades of all the house drains at various points which saved considerable time and reduced errors to a minimum. The exterior yard grades were directly related to the street grades and the first floor grades. Interior yard grades, particularly adjacent to the buildings, were directly related to the first floor level or basement floor level. The Tenement House Department requirements had to be met, and the interior grades designed for both pleasing landscape effects and good surface drainage. The cut and fill were designed for economy as well.

Positive surface drainage was essential. A system of inlets, catch basins, and drains was installed in the interior yards and these systems were connected to street sewers. In each system the yard catch basin, from which the final connection is made to the street sewer, was trapped by a regular cast-iron hood to prevent debris from entering the street sewer. Inlets and catch basins were located at low points adjacent to walks and so spaced that the surface water would not be excessive at any point. "Waterfalls" over yard steps were prevented by intercepting-inlets at the tops of the steps. The drainage at the upper levels was intercepted by catch basins wherever possible to prevent erosion of the terraces. Drainage lines generally paralleled the walks which were, therefore, crowned to prevent flooding in the wet weather. At catch basins the walks were tilted or pitched so that the catch basin could receive drainage from both sides of the walk.

The gratings which were used for yard inlets and catch basins across or adjacent to walks were of a type that would not allow small heels to catch in the openings. The grades and drainage of the general playfield were designed to permit flooding in winter for ice skating.

THE HEATING SYSTEM

An average Bronx block contains a dozen or more apartment buildings, each with its own boiler room. Diversity of ownership usually bars combining the loads of several buildings, although installation and operating costs might be reduced thereby. At Hillside the five blocks form virtually a continuous structure under one ownership. The designing engineers were to recommend the most advantageous number or arrangement of boiler rooms.

Analysis was made beginning with two or more boiler rooms for each block. Actual layouts of boilers and main piping for each scheme were made and comparative installation costs determined. The lowest installation cost was obtained with only one boiler room per block, resulting in fewer and larger-sized boilers, fewer valves and boiler trimmings, only one chimney, etc., factors which offset the additional cost of longer distribution mains. Also less labor is required with one boiler room per block than with two or more.

A single boiler plant for the whole five blocks would save boiler-room labor but there were possible difficulties in crossing intervening streets, objections to concentration of power at one point. The necessary chimney and boiler house would have been objectionable.

Each of the four large blocks, therefore, has one boiler room with three equal-sized boilers, and the fifth half block, one boiler room with two equal-sized boilers. The boilers were sized so that in an emergency full heating service in zero weather can be maintained with one boiler shut down and domestic hot water temporarily discontinued.

All boiler rooms are so located that all returns are by gravity, without a single lift fitting.

Oil fuel was chosen to save labor, eliminate dust and the handling of coal and ashes.

A two-pipe vacuum return system of mains and risers

was used. While the installation cost slightly exceeded that of a single pipe system, it provided more rapid circulation and allows fuel savings through control which proportions the steam used to the severity of the weather.

Kitchens and bathrooms have 2" blank risers (not radiators) vented at the tops through vacuum traps to the nearest return riser. Radiator branches are run exposed because of the floor construction. The 2-inch solid plaster partitions led to the use of exposed steam and return risers throughout. In order to avoid an unsightly crossing of radiator branches, only one radiator was connected to a pair of risers at each floor. Over 25 per cent of the total heating surface in each apartment, therefore, is in the form of exposed risers.

The control system, which has to control exposed risers as well as radiators, varies the pressure both in supply mains and in vacuum returns. A fairly constant differential pressure is maintained to secure circulation and both are raised or lowered to correspond with variations in outdoor temperature. Each boiler room has a distant reading recording thermometer with the bulb outdoors. Steam pressure is automatically maintained at the point set by the attendant.

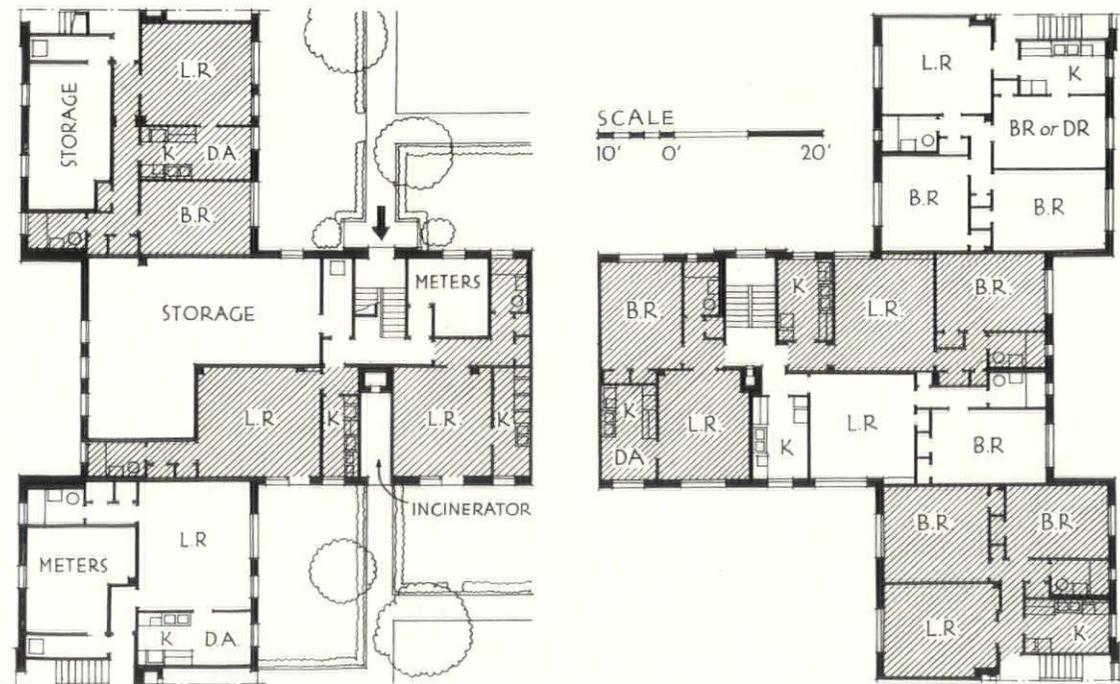
The floors of the basement apartments are at grade level on the court side and below the floors is a 4-foot space for pipes and conduits.

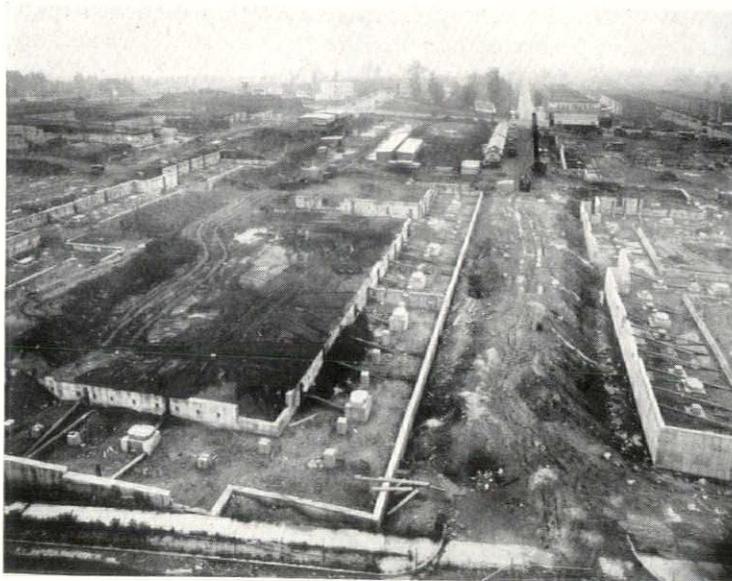
As most of the buildings are only two rooms wide (about 30 feet), it was possible to run a single steam main near the middle with riser run-outs extending to the risers on each side, so sized and pitched that condensation drains back to the steam main.

To keep down installation costs, practically no valves were used outside of the boiler rooms, except radiator valves.

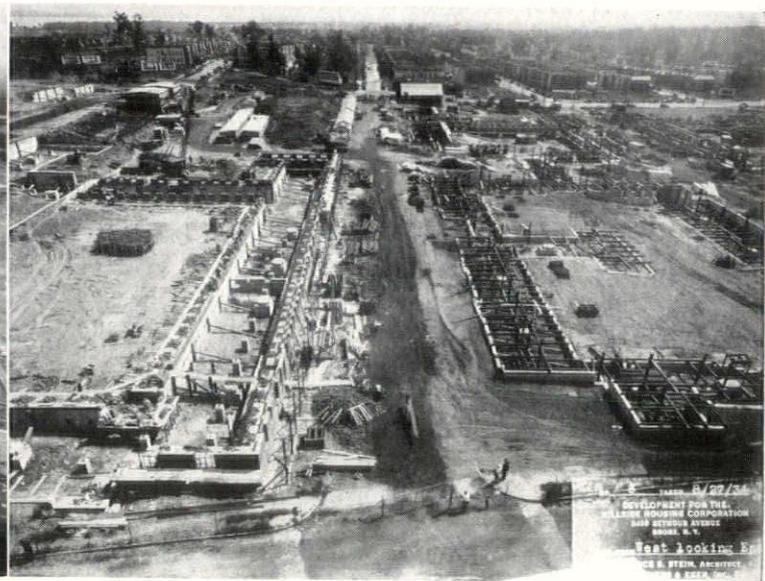
In each boiler room, one boiler is equipped with a full automatic burner, the other burners being semi-automatic. This allows a minimum operating attendance in summer, when steam is used only for domestic hot water.

Basement plan showing garden apartments, approaches, and services . . . Typical floor plan (right) showing three-, four- and five-room apartments





1 JULY 26, 1934



AUGUST 27, 1934 2

Progress photographs, from foundation to finished project, show the stages of the work on the dates given

THE ELECTRICAL SYSTEMS

At Hillside it was essential to provide outlets and a system of distribution sufficiently flexible to take care of reasonable requirements of tenants, also to insure a minimum of electrical hazard, to secure low cost of operation and maintenance and to avoid increasing installation cost. The fixed charges involved in installation cost are minimized by eliminating elaborate equipment not justified in a low-rental housing project.

The maintenance cost inherent in lighting fixtures with pull chains or cords was reduced by installing a control switch in every room. Ceiling lighting fixtures only are installed; in the living rooms base insertion receptacles only are provided to receive the tenant's floor or table lamps. An insertion receptacle was provided in each chamber for a lamp or a heating pad, and receptacles in the dining alcove, kitchen and bathroom for electrical appliances. If these were not provided the tenants would make their own extensions from light outlets involving hazards and unsightly marring of plaster and trim.

Anticipating the increase in the use of electrical devices, because of decreasing costs of electricity, the electric feeder supplying each apartment has been made of No. 8 B & S gauge (35 amperes capacity) at an unbelievably small additional first cost, to permit electric ranges in the future. All apartments have two (or more) circuits, so that, except under extraordinary conditions the blowing of a fuse will not leave an entire apartment in darkness. The outlet for the electric refrigerator is not on the same circuit as the radio set and this lessens the "noises" in the radio.

The distribution center for each apartment is a small cut-out box containing two or three (as the case may be) screw-base plug-fuses, set in the foyer partition. Shallow boxes were used having the small hinged-at-the-top doors, projecting slightly, painted to match the wall.

The tenants' meters are in the basements because tenants

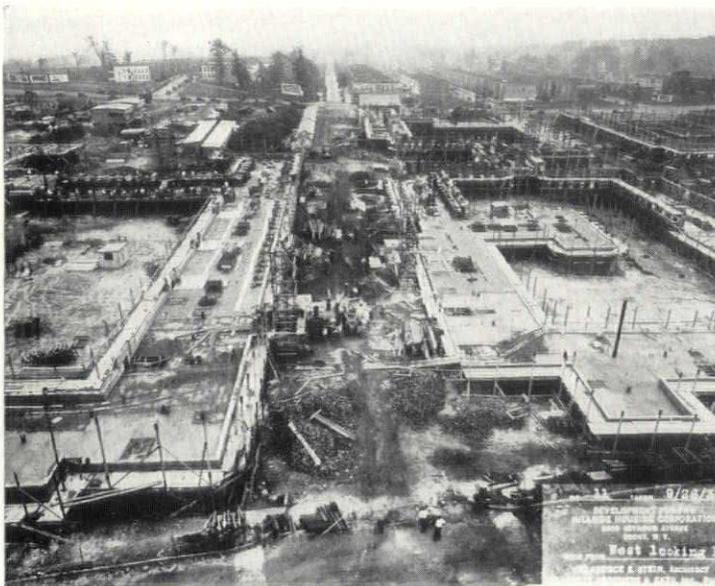
may be out when the meter reader calls. In 4-story buildings particularly this arrangement does not involve expense in feeder installation, because with 3-phase service three apartments in a vertical tier can be served by the 3-phase wires and a common neutral in a single 1-inch conduit. By using identifying colors in the braid all apartments on the same floor throughout can be connected to the same phase of the system, convenient and time-saving in maintenance.

The Bronx Gas & Electric Company has run its low tension street feeder system (3-phase, 4-wire at 120/208 volts) down the six streets and services are brought into each block at five points in the larger blocks, and at three points in the half block. At one point in each block (the boiler room) the service is large enough to supply all the public lighting and power for that block (metered at one point for lowest possible rate) and to provide current for adjacent tenants.

Where tenants' requirements only are supplied, service enters through a service switch, thence to a Tenants' Distributing Lighting Panelboard from which 3-phase, 4-wire branch feeders are run to the groups of tenant meters in the basements of the neighboring units. The feeder to each apartment is single-phase.

Public lighting is divided into three groups; (1), "constant," which includes spaces without natural light, or those having local switch control; (2), "intermittent," which includes stair halls having electric lighting during certain hours only, and, (3), outside lighting of courts and gardens.

Control for the intermittent and outside lighting in each block is the boiler room. Public Lighting Sub-Panelboards have been located at 4 or 5 points in the basement of each block for individual circuits which can have conductors of small size. From the Main Distributing Public Lighting Panelboard in the boiler room these local sub-panelboards are supplied by 3-phase, 4-wire feeders. The main switches on the latter for intermittent and outside lighting are of the automatic remote control type. Time switches in the boiler room operate these automatic switches.



3 SEPTEMBER 26, 1934



4 OCTOBER 25, 1934

EXTERIOR CONSTRUCTION

Footings

Concrete, 12" thick in Blocks I, II, III with a 6" spread. In the 6-story building the footings are 16" thick and 6" spread. In Blocks IV and V they are 16" thick with an 8" spread due to a poor soil.

Foundation Walls

Concrete below grade.

Brick

Dennings Point $8\frac{1}{4}" \times 3\frac{3}{4}" \times 2\frac{5}{8}"$ thick giving a typical-floor wall $12\frac{1}{2}"$ thick. This over-sized brick was made specially for this job, saving in the number of bricks laid and handled.

Floor Height

9'2" typical, floor to floor, 13'0", fourth to coping.

Roof

Five-ply felt and tar-coated with slag; 1" Celotex insulation underneath.

Flashing

Built-in membrane type except at chimneys where copper was used.

Walks and Steps

Cement. Main walks are 5' wide; steps 5" rise and 15" tread, where possible.

INTERIOR CONSTRUCTION

Floor slab, short-span reinforced cinder concrete, 4" thick, with an integral floated finish for all rooms except baths and kitchens. The mix was 1:2:5.

INTERIOR FINISH

Floors

Living Room, Chamber—Wood.
Kitchen—Linoleum.
Bathroom—Tile.
Stairs—Colored cement.
Closets—Painted cement.
Storage, prams and passages—cement.

Wood Floors

Block type, by the Bruce Flooring Co., were set in cold mastic; eliminated use of sleepers and cinder fill.

PARTITIONS

In apartments, 2" solid plaster on 1" channels and wire lath.
For pipes, 10" hollow, plaster, for baths. 5" hollow, plaster for kitchens.
Between apartments, doubled, 5" finish to finish with Cabots Quilt between.
Stairs, 4" hollow block.
For storage, etc., terra cotta.

TRIM

Exterior Door Bucks

Grade "D" soft pine, painted.

Exterior Doors

Pine, $1\frac{3}{4}"$, glazed.

Apartment Entrance Doors

Are Kalamein, one-hour fire-test doors $1\frac{3}{4}"$ thick, 1 panel type.

Interior Apartment Doors

fir, $1\frac{3}{8}"$.

Bulkhead Doors

Kalamein, copper-covered, $1\frac{3}{4}"$ thick, flush panel.

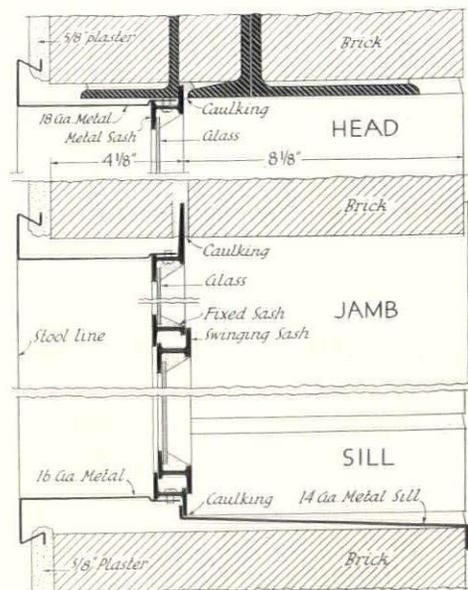
Window Trim

Hollow metal, delivered and set in the wall fastened to the windows, eliminated setting of windows into masonry or wood sub-frames and returning plaster window reveals, or having a heavy wood trim inside. Reveals 8" deep, to reduce width of trim.

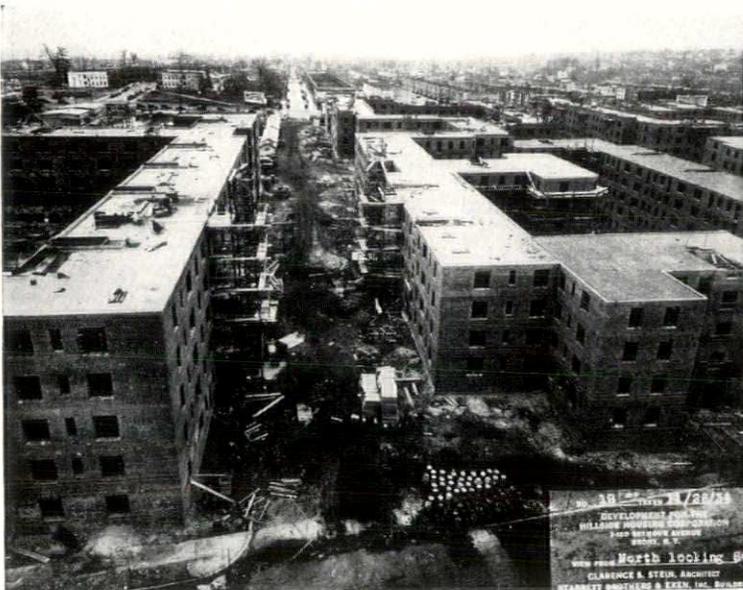
Base pine, grade "D", $3.4" \times 1\frac{1}{2}"$.

Windows

"Fenestra" steel casements, designed especially for developments of this type. Hinges are friction type, locked by contact handles; hinged metal screens.



Ingenious and economical window detail, showing metal trim which was delivered fastened to the steel sash.



5 NOVEMBER 26, 1934



6 DECEMBER 27, 1934

KITCHEN

The typical kitchen is 7'4" x 11'4"; range, 1'7" x 2'11", by J. Rose & Co.; sink, 1'10" x 3'6" by Standard, storage cabinet, 4'0" long; broom closet, 1'4" x 1'8"; refrigerator, 2'0" x 1'10", Frigidaire. Walls, plaster, painted with flat enamel; floor, linoleum "B" gauge.

A study was made of kitchens that had been built in Sunnyside, Radburn and Phipps Garden Apartments before the sizes were determined for Hillside. Width of 7'4" found very satisfactory.



A typical kitchen

BATHROOMS

The typical bathroom is 4'10" x 7'7"; tub, 2'6" x 5'0", by Standard; lavatory, 18" x 20", by Standard; medicine cabinet, 16" x 20". Water closet, syphon jet with a flush valve. Walls, plaster, painted with enamel; 6" tile base 4" around tub. The floor ceramic tile, mosaic, second grade, 3/4" square. Accessories, one-36" and one-30" towel bar, soap dish over tub, toilet paper holder, ceiling type clothes dryer.

PLUMBING

All house-drains, soil, waste and vent lines are of cast-iron. The leader lines connect directly to the house drainage. Each block has two or more sources of water supply from street main. The water supply depends on city pressure for lower block IV and V; upper blocks I, II and III have pressure tanks. All piping, hot and cold, is brass, hot water having circular return. Air chambers are provided at the top of all water supply lines.

HEATING

Two-pipe up feed, low pressure vacuum return system. Five boiler rooms. Steam mains run in air space under the basement floor. Risers are exposed in apartments and branches are run to radiators above the finished floor. Radiators are Corto type.

Kitchens and baths have risers as radiators.

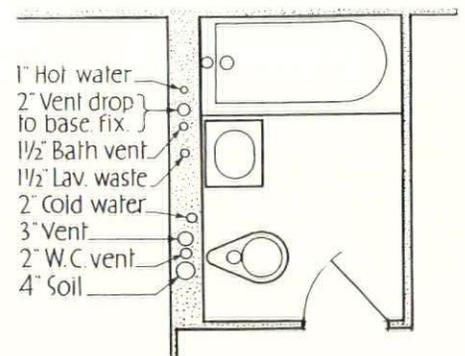
Incinerator, "Pyroneel," J. C. Rochester Co.

[See also page 29].

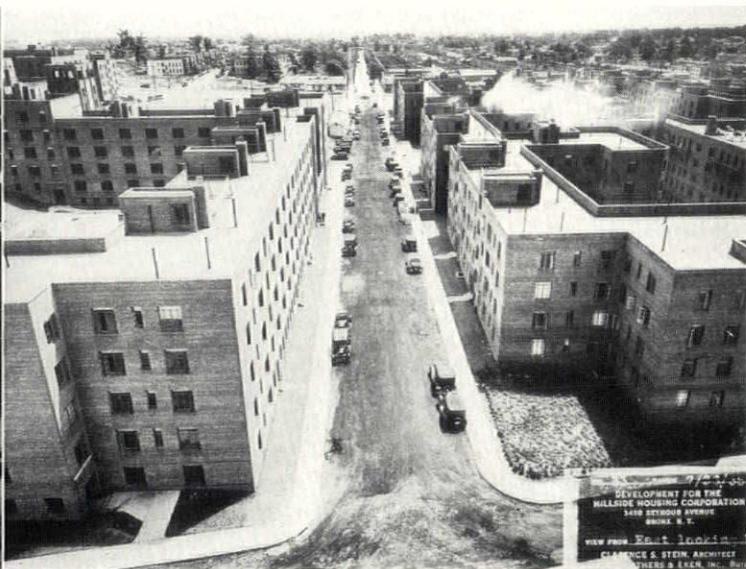
ELECTRIC

Room	Light	Outlets		
		Duplex	Plugs	Radio Switch
Kitchen	1 ceiling	2		1
Bath	1 bracket	1		1
Chamber	1 ceiling	1		1
Living Room		3	1	
Dining Alcove	1 ceiling	1		1
Prams	Varies			1
Slop sinks	1 pull			
Storage	Varies			
Incinerator	1 pull			(1)

See Electrical Systems (page 30) for details of wiring, circuits, etc.



Typical bathroom layout and pipe space



7 JANUARY 25, 1935

8 JULY 26, 1935

AREAS AND STATISTICS

AREAS	
Land area excluding streets.....	617,563 sq. ft. or 14.18 acres
Land area including streets.....	753,673 sq. ft. or 17.3 acres
Size of Park.....	1.75 acres
Size of Park including streets.....	125 acres
Gross land area per room excluding streets.....	125 sq. ft.
Gross land area per room including streets.....	162 sq. ft.
Persons per acre excluding streets.....	370 persons
Persons per acre including streets.....	303 persons
Floor area, total.....	1,247,815 sq. ft.
Total cubage.....	12,676,514 cu. ft.
Percentage of coverage excluding street.....	38.7%
Percentage of coverage including streets.....	31.8%
Net area of Typical Kitchen.....	83 sq. ft.
Net area of Typical Bath.....	37 sq. ft.
Net area of Typical Living Room.....	200 sq. ft.
Net area of Large Bedroom.....	188 sq. ft.
Net area of Small Bedroom.....	138 sq. ft.
Average gross area per room.....	221.6 sq. ft.

APARTMENTS	Basement	Typical	Total
Two-room apartments.....	106	56	162
Three-room apartments.....	55	443	498
Four-room apartments.....	21	629	650
Five-room apartments.....	6	100	106
Total No. of apartments.....	188	1228	1416
Total No. of rooms.....	491	4457	4948

COSTS AND RENT

Total population.....	5250 persons
Actual cost of construction: exclusive of architects' and builders' fees and carrying charges; January 1, 1936.....	\$4,481,111
Landscaping, utilities, and ground improvements.....	176,344
Total cost of project excluding land to January 1, 1936.....	5,041,445
Total cost of land.....	448,169
Cost of land.....	\$.70 sq. ft.
Average rent per room.....	\$11 per month

HILLSIDE'S WHO'S WHO

Architect; CLARENCE S. STEIN

Assistants; FRANK E. VITOLO, Executive; ALBERT LUEDERS, Plan and Design; ALLEN KAMSTRA, Site Plan; HENRY BOAK, Detailing; RALPH EBERLIN, Sanitation and Utilities

Structural Engineer; ROLLIN C. BASTRESS

Heating and Electrical Engineers; EADIE, FREUND AND CAMPBELL, MARIO C. GIANNINI

Landscape Architect; MARJORIE S. CAUTLEY

Social Research; CATHERINE BAUER and MARGARET S. MORGAN

Specifications; HAROLD R. SLEEPER

General Contractor; STARRETT BROTHERS AND EKEN

RUSSELL H. HUNTER, Vice President

J. W. BOWSER, Superintendent

Supervising Engineer for PWA; FRANK A. ANDERSON

Representative N. Y. State Housing Board; WILLIAM WILSON

General Manager; FRANK C. LOWE

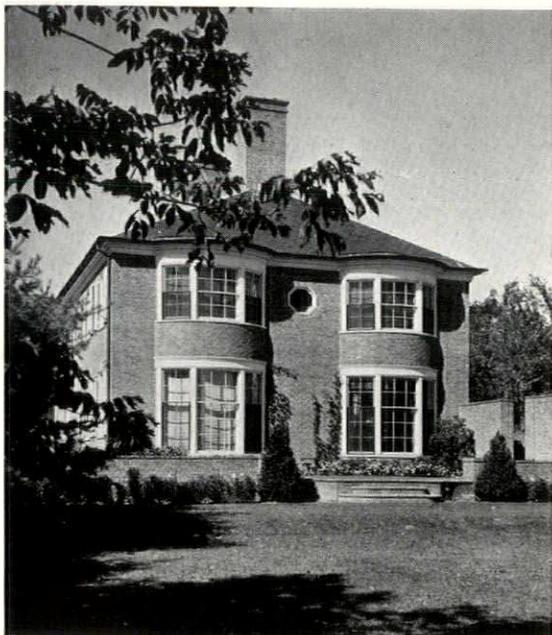
Tenant Activities; LOUISE P. BLACKHAM

Nursery School; MRS. JANE LUBOLT

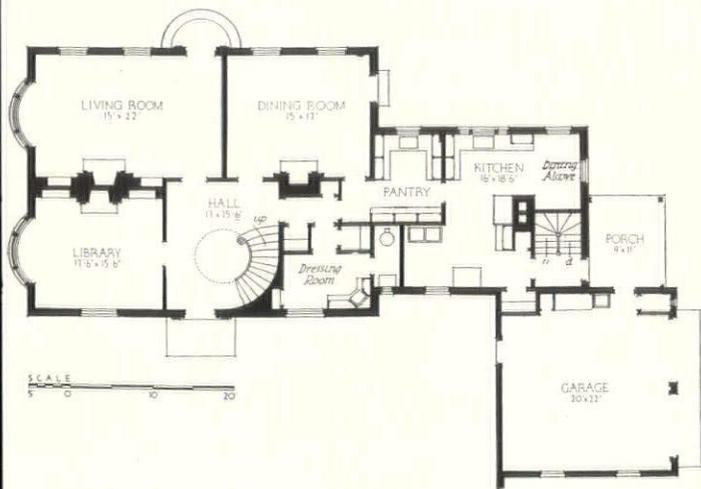
Owner; HILLSIDE HOUSING CORPORATION



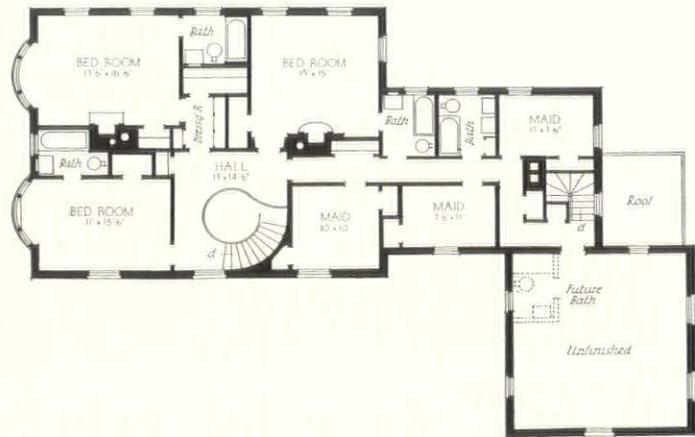
HOUSE OF MARION LITCHFIELD
BEDFORD VILLAGE, NEW YORK
GODWIN, THOMPSON AND PATTERSON, ARCHITECTS



To meet Miss Litchfield's desire for a formal type house, aristocratic Georgian architecture was adopted. The house was designed with restraint and dignity. The exterior walls are of warm, salmon-tone brick, laid with a fine bead joint. The shutters, doors and window trim are painted white. The roof is black slate and the flashings are sheet lead. All leaders and gutters are lead-clad copper. The fence enclosing the motor court is constructed of interwoven split oak laths, in a weathered natural color. The main portion of the house is heated by a split system with warm air delivered from an air conditioning system. The servants' quarters and the garage are heated by direct radiation

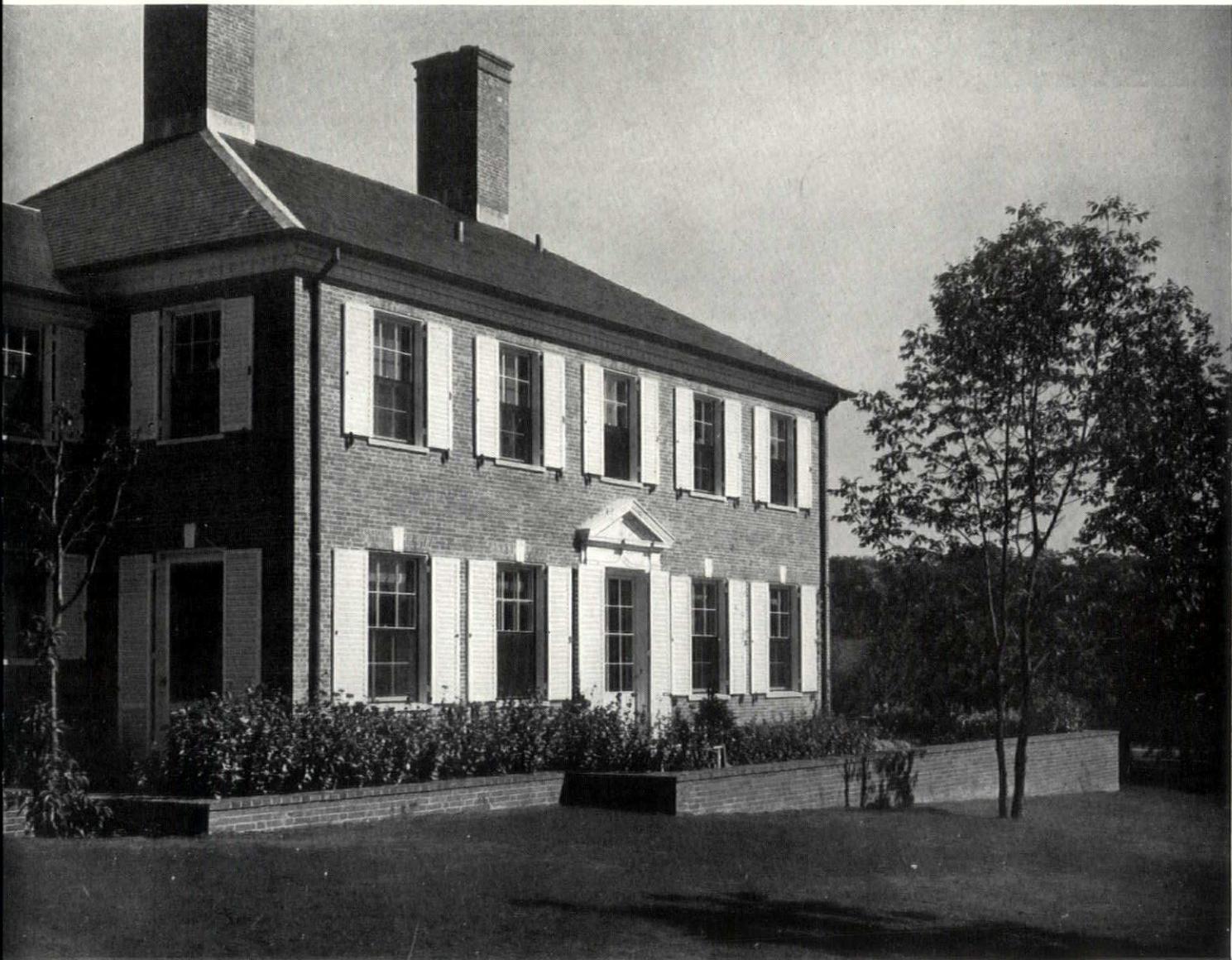


First Floor Plan



Second Floor Plan

The Garden Terrace



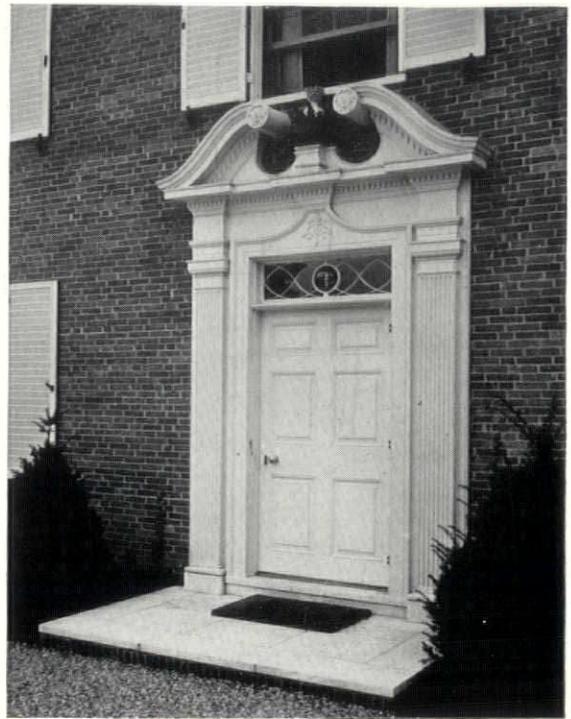


**HOUSE OF MARION LITCHFIELD
BEDFORD VILLAGE, NEW YORK**

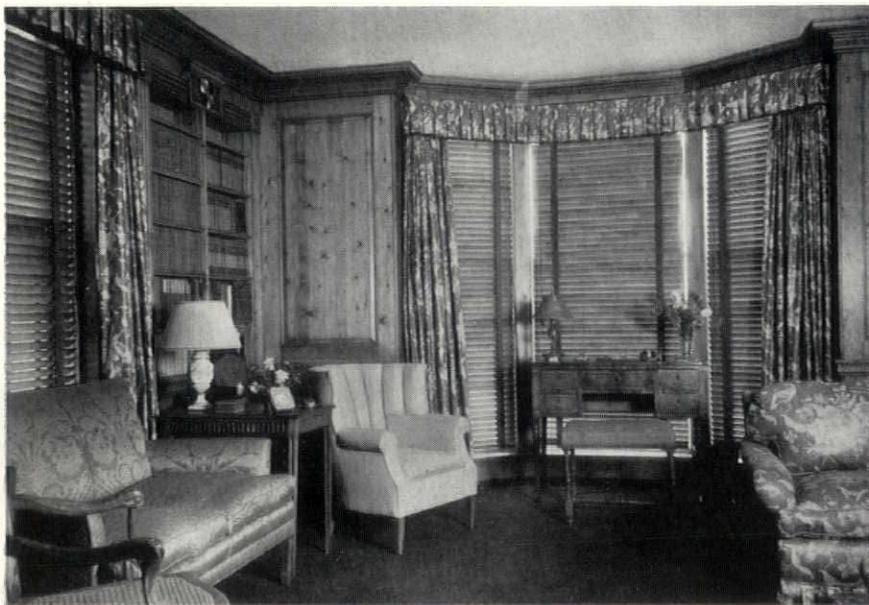


The entrance to the living room from the west side of the house is shown above. . . The walls in the stair hall are plaster, painted an oyster white and all wood trim is painted to match the color of the walls. The floor is black and white Zenitherm, laid in a diamond shape design. The stair treads and hand rail are mahogany, and the balusters and newels are maple. . . The living room walls are plaster in turquoise blue, with the dado of paneled wood, and all trim painted to match the walls. The mantel is a reproduction of one in an old house in Williamsburg, Va. The facing of the mantel is Sienna marble. The draperies are glazed chintz in a flower design, and the carpet is mauve. The venetian blinds are yellow





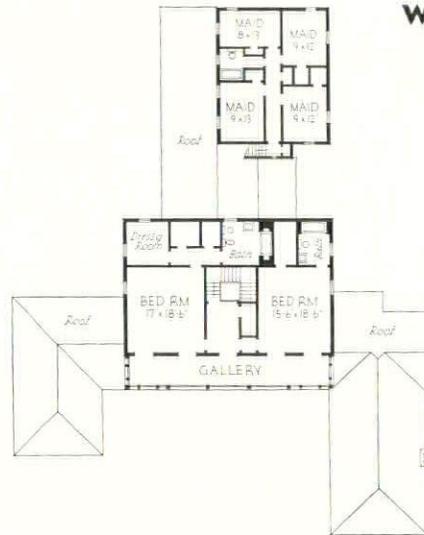
**GODWIN, THOMPSON AND PATTERSON
ARCHITECTS**



The main entrance, shown above, is on the east side of the house facing the motor court. . . The library, at the left, is paneled in knotty pine, finished a natural tone. The mantel is black and gold marble. The small shields over the book cases are old coats of arms. The circular bay windows in the library and in the living room are constructed with square cornices on the inside to accommodate the venetian blinds and the draperies. The draperies are glazed chintz in a flower design and the background is mauve. The carpet is also mauve. The venetian blinds are stained to match the natural color of the walls. The large bay windows in both the library and living room overlook the gardens to the South



PHOTOS: SAMUEL H. GOTTSCHO



**HOUSE OF JAMES G. ALEXANDER
WYETH AND KING, ARCHITECTS**

PALM BEACH, FLORIDA

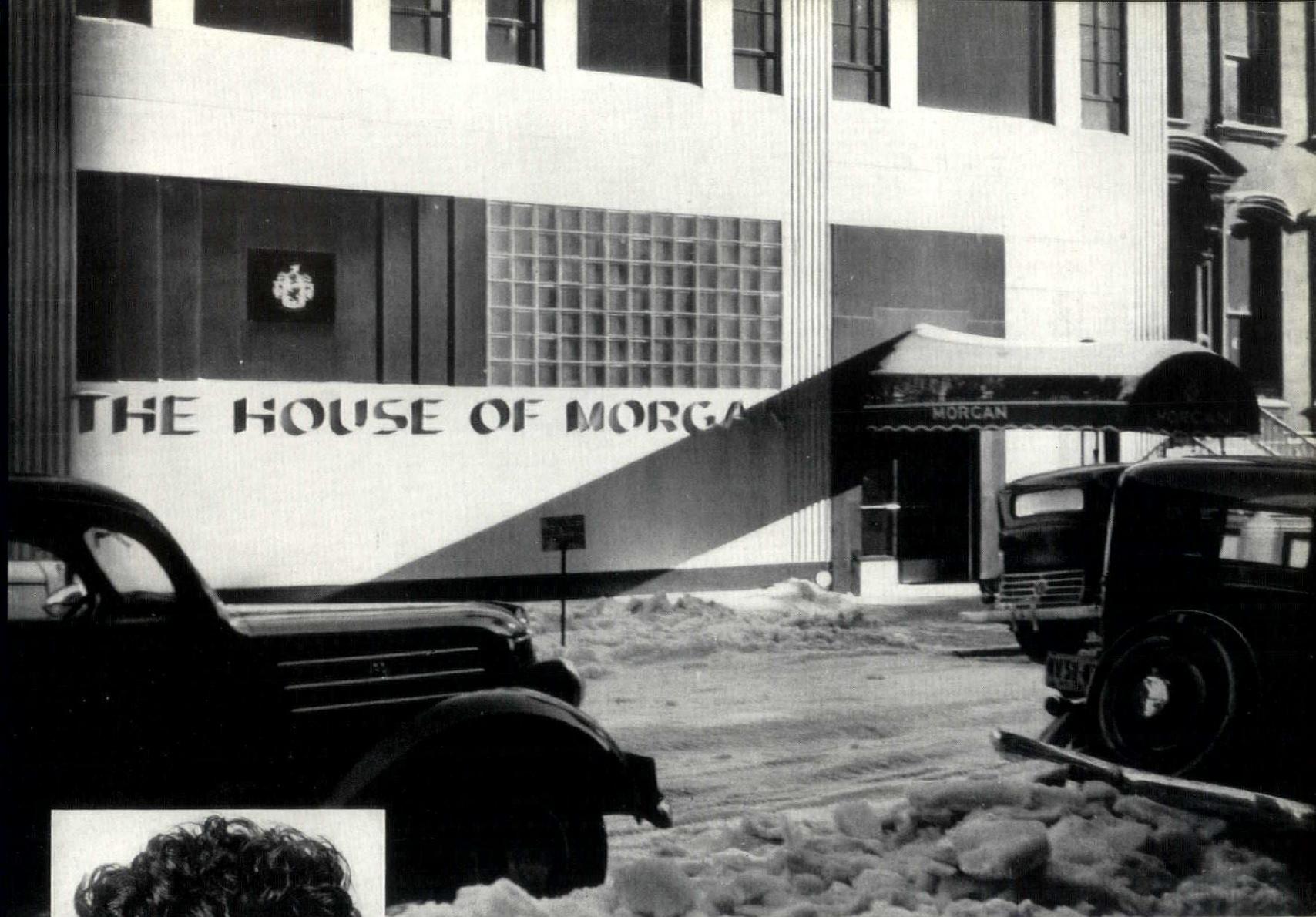


The owners required a four-bedroom house for a lot facing south and desired privacy in the patio and living room, both with southern exposure. The problem was solved by placing the drive near the lot line at the east side where the entrance wing serves to screen it from the patio. This placing of the entrance wing made possible a living room with three exposures



HOUSE OF JAMES G. ALEXANDER, PALM BEACH, FLORIDA. WYETH AND KING, ARCHITECTS

The design of the Alexander house is based on the less formal type of plantation houses to be found throughout the far south. The living verandah and patio are requisites for outdoor living in a semi-tropical climate. The verandah is 15 feet deep, semi-enclosed by jalousies at each end, and can therefore be used throughout the season as an additional living room. The house is built of white-painted clapboards, laid 5 inches to the weather, and has a white shingle-tile roof, the color being baked onto ordinary red tile. The shutters are painted an off-white



JAMES H. CONNELLY PORTRAIT



THE HOUSE OF MORGAN

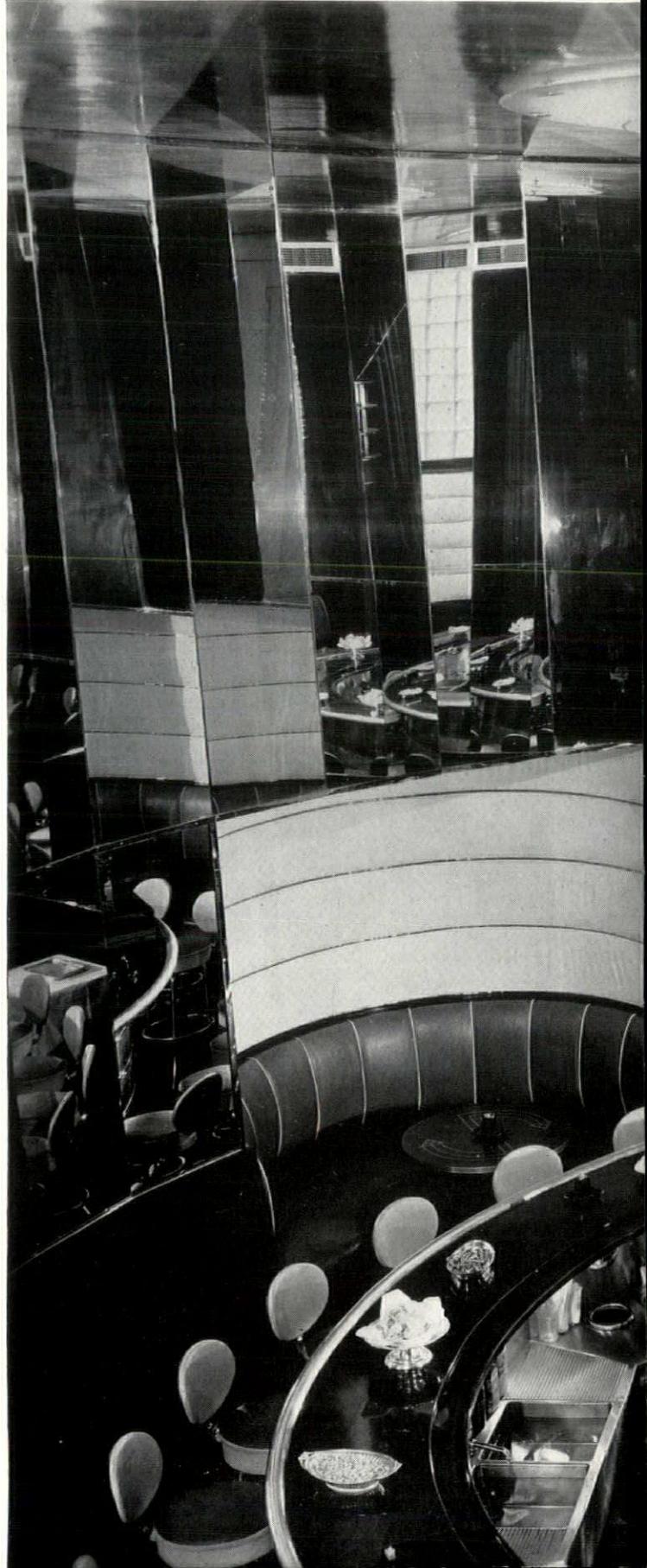
SCOTT AND TEEGEN, ARCHITECTS

Because it is located in the heart of one of New York's most fashionable shopping districts it was necessary that the facade of Helen Morgan's newest venture be arresting without being garish. Started after the exterior of the building itself was practically completed, the possibilities of design were naturally limited, but by working within these confines with simple forms, expressed in contrasting surfaces of limestone, black marble and glass brick, a dignified result was obtained.

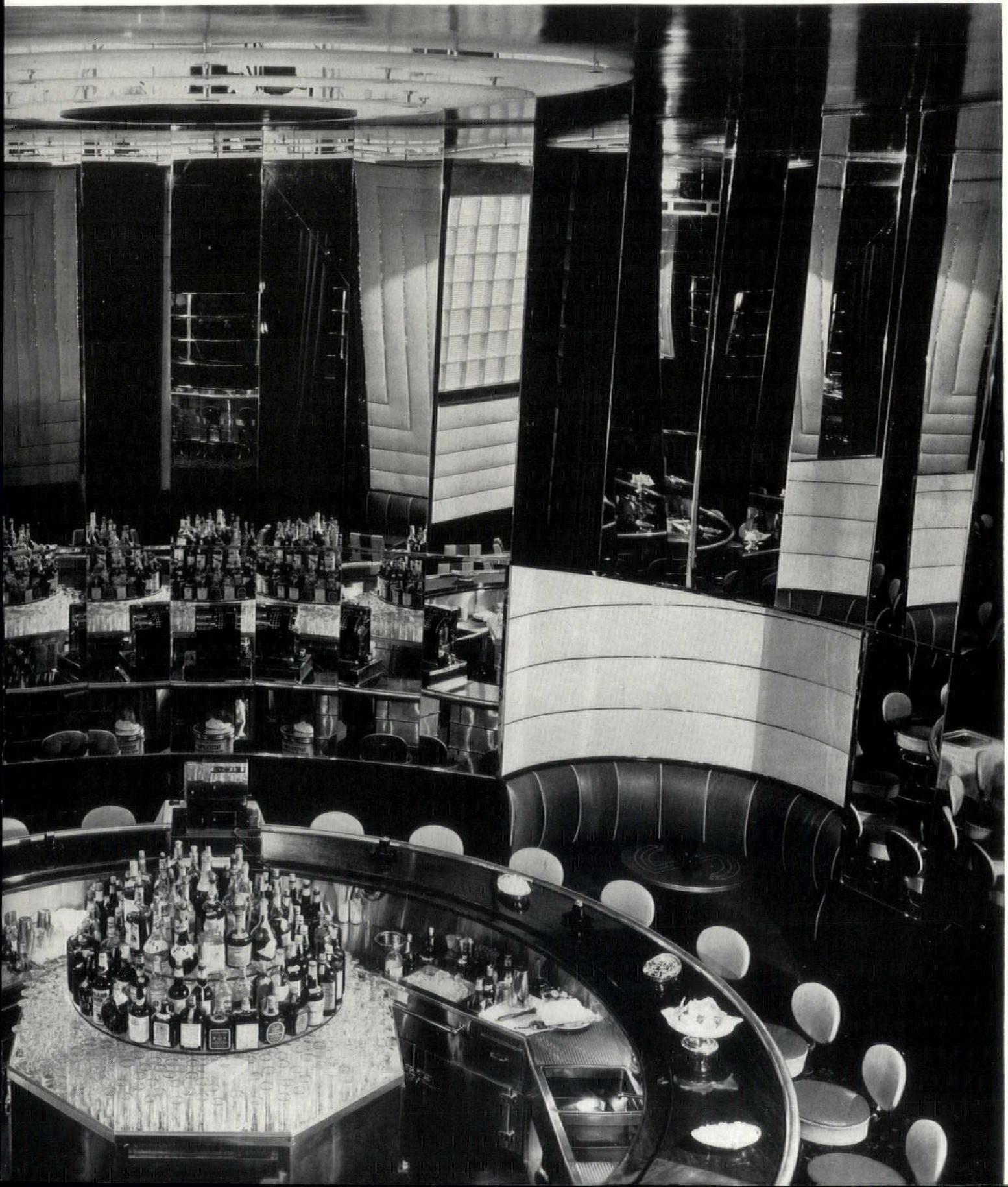
In the interiors the architects successfully solved the problem of enhancing a personality definitely of the theatre without obtruding on the sense of intimacy and the sophisticated tastes of a wealthy clientele. This they did by means of an architectural treatment that, while gay, has a sense of permanence, by an ingenious use of various materials in stimulating color combinations and by a flexible lighting system which varies in color and intensity to suit the mood.

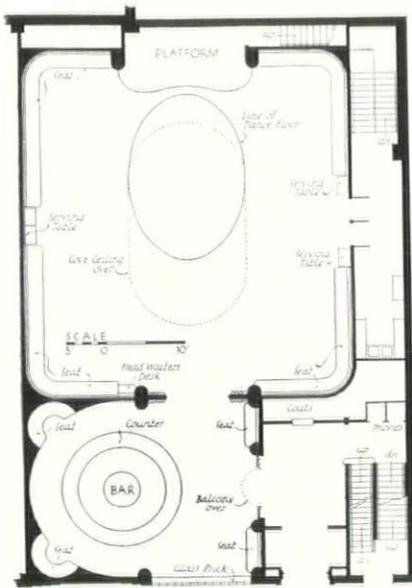
THE HOUSE OF MORGAN
SCOTT AND TEEGEN, ARCHITECTS

PHOTOS: BY F. S. LINCOLN

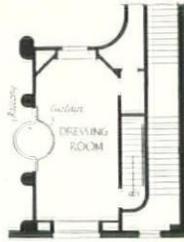


Gold mirrors, satin-finished aluminum, chromium-plated trim, white leather and burgundy-red velvet plush combine to create an effect at once festive and rich. Naturally the large circular bar is the focal point of the cocktail lounge which has mirror walls from floor to ceiling and two recessed niches. Facing it is the balcony from Miss Morgan's dressing room which is placed over the door on a wall recalling the treatment of the main dining space (illustrated on the following page) with its white leather walls accented with chromium mouldings and red plush upholstered seats. The lounge and dining room are further unified by the carpet, in a pattern of red, blue, green and gold on a blue-black background, designed by the architects





Two views of the dining room and a plan which shows the relationship of the dressing room balcony to the cocktail lounge

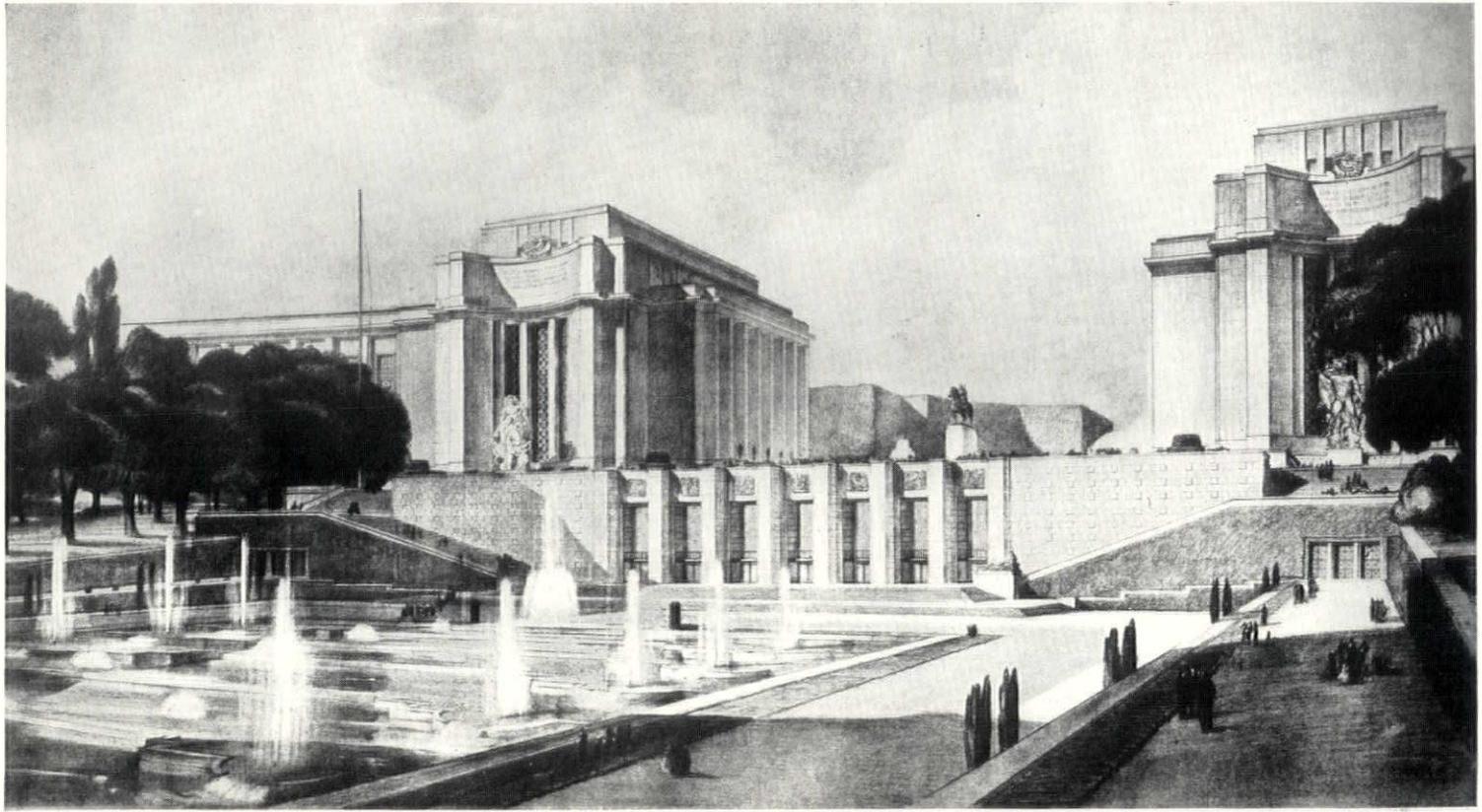


THE HOUSE OF MORGAN, NEW YORK

SCOTT AND TEEGEN, ARCHITECTS



PHOTOS: BY F. S. LINCOLN



THE PARIS MODEL FOR THE FAIR

ARTS AND TECHNIQUES IN MODERN LIFE: INTERNATIONAL EXPOSITION, PARIS 1937

PURPOSE: To demonstrate that art can render life better and more beautiful for all people, that there is no clash between beauty and usefulness, that art and technique must be united. The French Government expects it to serve as an expression of international co-operation in the fields of intellect, art and industry

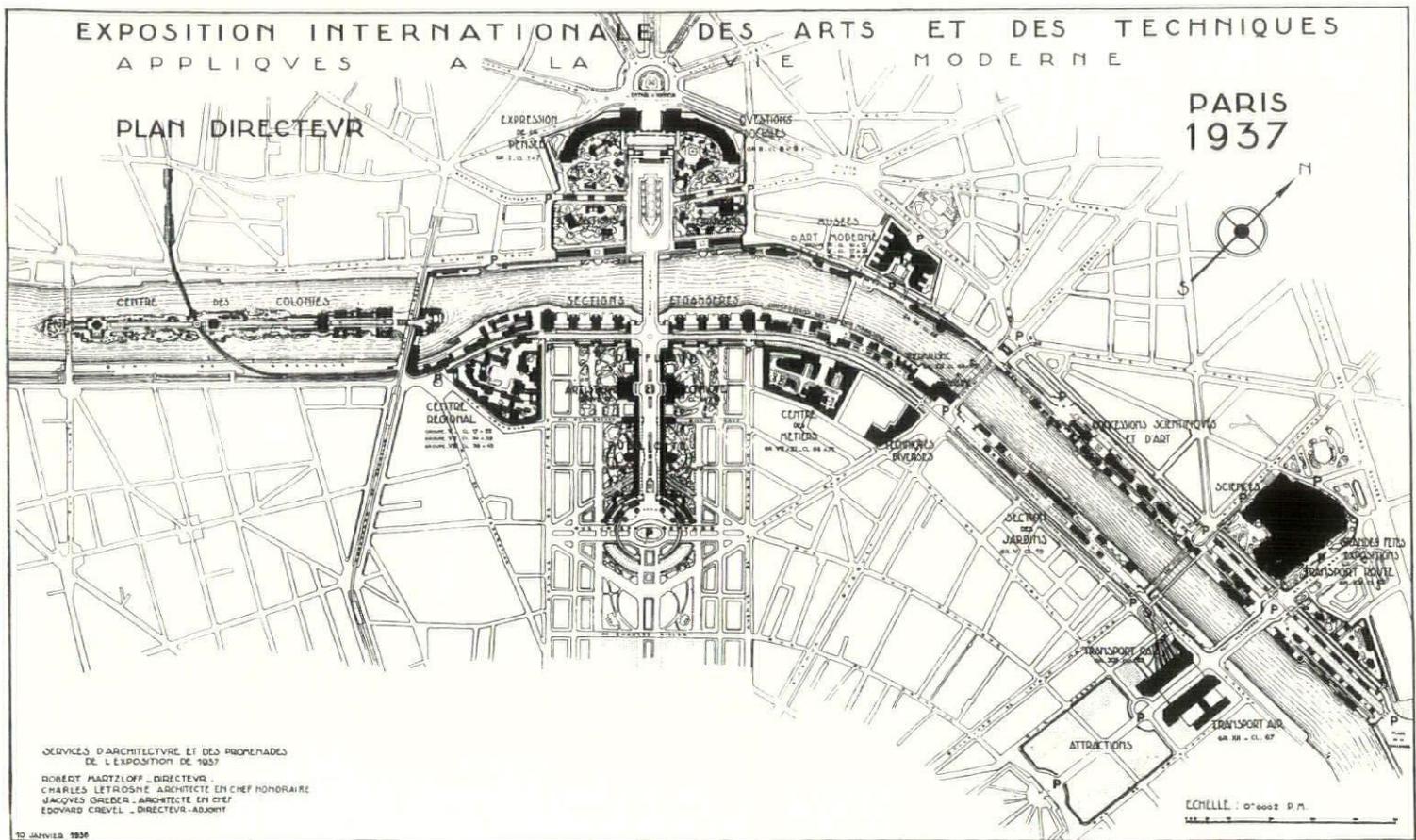
Scope. Exhibits must be really original and of new inspiration. Copies and imitations of former styles will be excluded.

There will be fourteen main groups, sub-divided into 75 classes. 1. Expression of Thought. 2. Social Problems. 3. Artistic and Technical Education. 4. Diffusion of Artistic and Technical Knowledge. 5. Town Planning and Architecture. 6. Graphic and Plastic Arts. 7. Building. 8. Interior Decoration and Furniture. 9. Art Crafts. 10. Printing and Publications. 11. Fashions, Jewelry and Accessories. 12. Transportation and "Tourisme." 13. Fetes, Attractions, Sports. 14. Publicity. All civilized countries have been officially invited to participate.

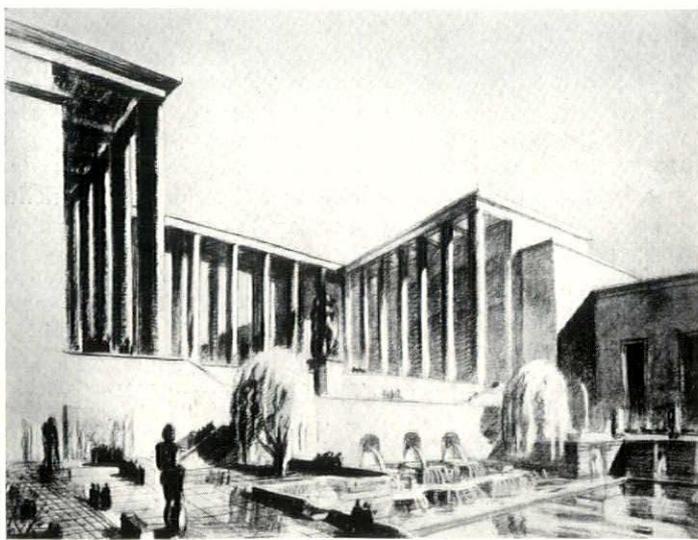
Site. 156 acres in the center of Paris on both banks of the Seine from the Pont Alexandre III to the Pont de Grenelle,

a distance of nearly two miles, and including the Ile des Cygnes, between the Pont de Passy and the Pont de Grenelle, have been made available. (See plan.)

Permanent Improvement. 165,000,000 francs, a third of the total budget of 472,000,000 francs will be expended in permanent improvements by the,—1. Redemption of blighted areas now occupied by; (a) The Military Supply Depot; (b) The Railroad Yards; (c) The Government Warehouses; (d) Old buildings on the Avenue Rapp. 2. Construction of Permanent Structures; (a) Two miles of planted terraces over the State Railway on the left bank; (b) Widening the Pont d'Iena to 115'; (c) Creating an underpass at that Bridge; (d) Building two Museums of Modern Art; (e) Reconstruction of the Trocadero, giving additional space for



the Museum of Historical Architectural Sculpture and the Museum of Ethnography, as well as for housing the Naval Museum (now in the Louvre) and the creation of a new Museum of Photography; (f) Creation of a vast terrace in front of the Trocadero on the hill of Chaillot with a new Concert Hall seating 3500 under the terrace. Reconstruction of the fountains and lower terraces leading to the Seine. The beautiful trees and shrubs of the quays, the Trocadero



Sketch of a portion of the Museum of Modern Art.

gardens, the Champ de Mars, the grounds of the former Garde Meuble, of the Grand Palais and of the Esplanade des Invalides will all be preserved.

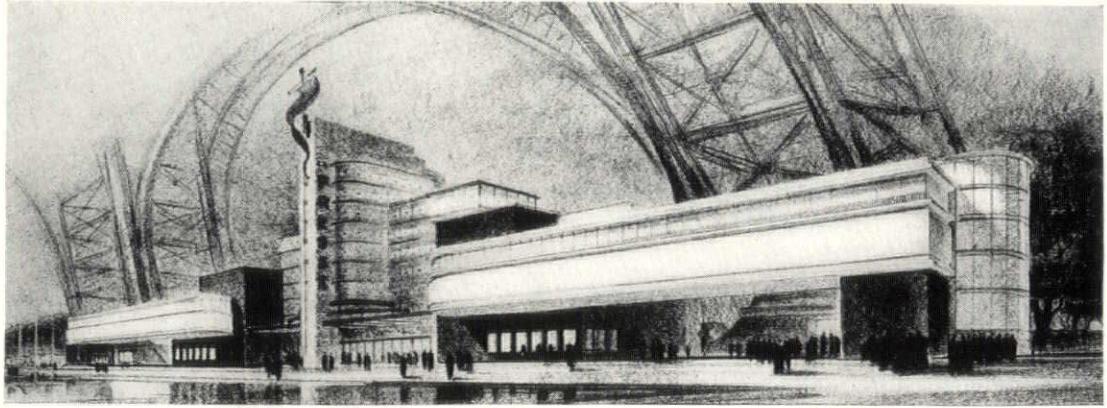
Character. There will be no huge glaringly hot exhibition halls set out in barren wastes. Moderate-sized buildings will line the streets, be placed in the gardens and will have somewhat the appearance of beautiful shops, whose attractive show window displays invite the visitor to enter to see the entire exhibit.

The buildings will be designed in a modern spirit but with no endeavor to be revolutionary or bizarre. They will be constructed of modern prefabricated materials.

Harmony with Individuality. The silhouette and mass relationships of all the buildings have been determined on a scale model of the entire site (including existing buildings and trees,) before being awarded to the individual architects or group of architects for final design. As a result of competitions open to all French architects, 230 were chosen and formed into 78 groups. They now are engaged in the design and construction of the buildings, their settings and gardens, as well as of the treatment of the quays, bridges and so on. This procedure will insure a general unity of scale and of effect, with individuality in expressions.

The use of color in materials and pigments on individual buildings and groups of buildings is also subject to a general scheme of complementary and contrasting effects. Both daylight and artificial light have been considered in the study. Advertising signs will be regulated so as not to interfere

The new Palais du Trocadero and gardens are shown on the opposite page. . . . Under the Eiffel Tower will be the Pavillon de la Presse (right). . . . The Place du Trocadero, looking toward the Eiffel Tower (below)



with the harmony of the buildings and their settings. Even sound effects will be subject to a general control to avoid the clash of conflicting wireless programs.

Interior circulation. The plan is so arranged that streets pass directly in front of or under the buildings facing the Seine, thus avoiding detours. Small silent moderately speeded electric automobiles will be available as well as especially designed launches and gliders on the river. Escalators and moving sidewalks on some of the bridges will make the crossing from one bank to the other bank convenient, easy and rapid. All of this, in addition to the many entrances to the grounds, the moderate sizes of the buildings, the shaded walks and gardens will add to the pleasure and comfort of the visitors.

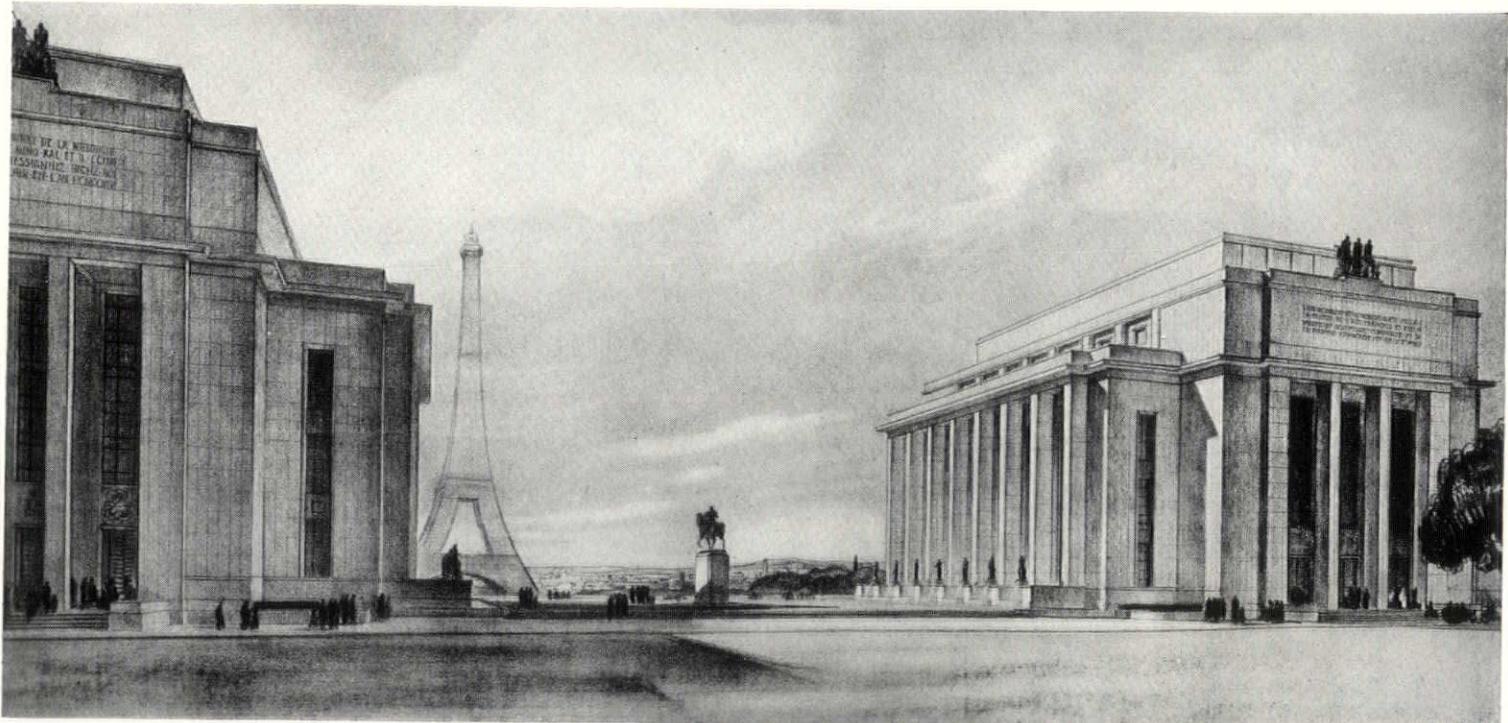
Museums of Modern Art. These twin buildings, permanent additions to the long list of museums which enrich Paris, will, for the duration of the Exposition, house the French and Foreign Art Exhibits that are not placed in buildings especially constructed for their classes.

Esplanade des Invalides. Separated from the Exposition, yet connected with it and subject to its general control of design, color, etc. an Amusement Park with especially selected attractions for adults and children will be built.

Administration. Under the Ministry of Commerce and Industry by a General Commissioner, M. Edmond Labbe, former Director General of Technical Education, by an Assistant General Commissioner, M. Paul Leon, former Director General of Fine Arts, by a Chief Architect, M. Jacques Greber and others.

Charges. Except for "commercial concessions" no charge will be made for space occupied. The national pavilions and general exhibition buildings will be erected at the expense of the Exposition authorities. This unique provision will greatly decrease the cost of participation.

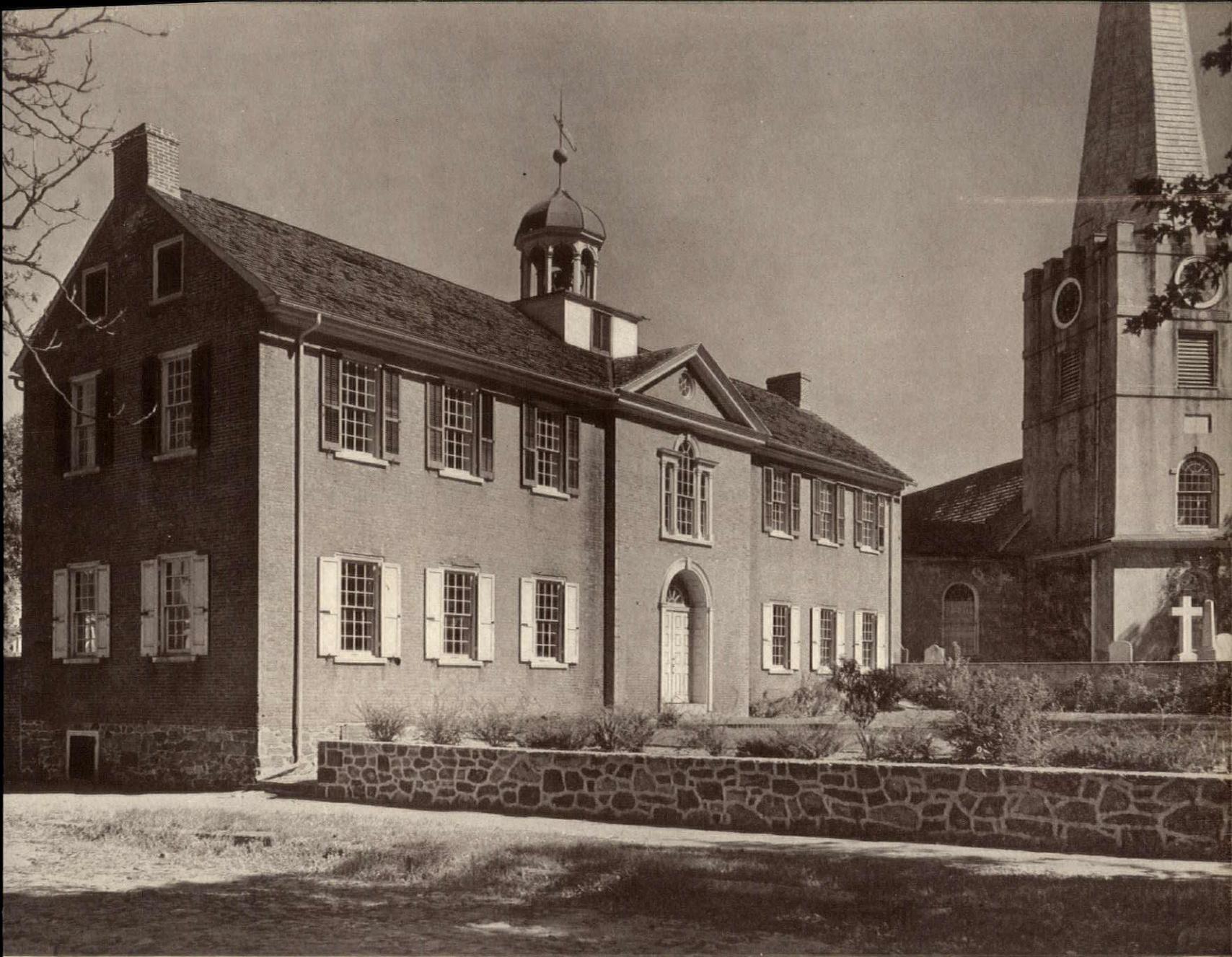
NOTE.—The paragraphs above are excerpts from a more complete descriptive summary prepared by Julian Clarence Levi, chairman, Committee on Foreign Relations, A. I. A., who is co-operating with the French authorities.



HOUSING . . . Facts and Solution

HOUSING is leading the profession far afield from its obsessions of the last fifty years, far from the "art of building," into realms of economics, sociology, finance and politics. While some members of the profession are lost in these unfamiliar woods, and but few get a clarifying air-view, the effect is broadening.

- It is so easy to become confused in thinking of Low-Cost Housing that it will pay to look at the underlying facts, and the possible solutions that are suggested.
- **FACT ONE . . .** At least one-quarter of the population of the U. S. lives in dwellings that are in large measure inimical to the welfare of the community (and the individual), that are inadequate, unsanitary, unsafe, uneconomic in every sense.
- **FACT TWO . . .** The low income group lives in such quarters because they cannot earn enough to pay the rent necessarily involved in the construction of new, decent housing.
- **FACT THREE . . .** They will continue to live in squalor, and the quarters will continue to become worse, unless (**SOLUTION ONE**) wages and employment increase to such an extent that economic rents can be paid; or (**SOLUTION TWO**) rents can be reduced by lowering land cost, interest cost, taxes and maintenance and obsolescence costs; or (**SOLUTION THREE**) the State (the collective public) pays a large part of the rent for them in one form or another; or (**SOLUTION FOUR**) the State becomes the owner and landlord.
- **SOLUTION ONE** (raising workers' incomes) obviously would eliminate the need for government subsidy or government ownership, but it would involve radical changes in both industry and government. . . . **SOLUTION TWO** is receiving much study by those interested in the technical aspects of real estate, mortgage financing, taxes, management and structural design. These are necessary and interesting studies, but results thus far have indicated that the costs involved in rent cannot be reduced without involving **SOLUTION THREE**, which is in effect Government Subsidy. Some students of the subject would go the limit (**SOLUTION FOUR**), inaugurating a program of government building, ownership and management of housing. Such a program would be disastrous to any political party at present, because of the expenditures necessary, the denial of the principle of private initiative, the effect on real estate. There is no bloc now powerful enough to pry the vast sums from the deficit-guarding Treasury.
- So all eyes turn to Subsidy as the solution for new Housing, studying the forms now employed and evolving new forms with the hope of attracting private capital. The present slum-housing is now subsidized by cities, for slum districts cost the cities more than they return in taxes, not to mention the loss in human values. Present possible legislation for new housing centers in the government control of credit, government grants and loans at low interest rates (1 per cent has been suggested) to local authorities, and, government insurance of the interest and principal of private capital's Housing loans.
- Architects can well endorse legislation which embodies, 1. government control of Housing credit in the interest of higher standards of construction; 2. a permanent government technical body for Housing research and to act as a "clearing house for Housing information"; 3. a program for *local* Housing control, and 4. provisions for co-ordinating public Housing with private Housing.



PHOTOS: SAMUEL H. GOTTSCHO

OLD BUILDINGS IN NEWCASTLE, DELAWARE

ABOUT FIVE MILES south of Wilmington is Newcastle, retaining around its "common" many fine examples of Colonial and early 19th Century architecture. The Academy building, illustrated on this page, was built in 1798 by Peter Crowding who was responsible for several other buildings in the town. The arched doorway and Palladian window recall the patriotic influence of Independence Hall. Recently acquired by Immanuel Church, (built in 1703, shown at the right above) it is soon to be used as a parish house. Besides the architectural charm of its many buildings Newcastle has an intensely romantic history. Founded by the Dutch, who built Fort Casimir there in 1651, it was captured by the Swedes in 1654 and a year later recaptured by the Dutch under the command of Peter Stuyvesant. The English, led by Sir Robert Carr, took it in the name of the King in 1664 and named it Newcastle. James, Duke of York, conveyed it and all land within a radius of 12 miles to William Penn, who first landed in America, at this place, on October 24, 1682



THE EXAMPLES of Newcastle's early architecture are shown pictorially in the following order: . . . 1. The Amstel House (above) built by John Finney about 1730 is now used as an historical museum. . . 2. The detail of the Amstel House (on the opposite page) shows the character of the early Delaware brickwork. . . 3. A detail showing the interesting double doorway of the Barr House built about 1795. . . 4. Captain Samuel Barr, the builder of this yellow-painted brick house, was in the China Trade. . . 5. The large house in the center was built by George Brydges Rodney about 1830 while that in the shadow was built by Robert Wylie in 1798. . . 6. Built in 1789 by Chief Justice Kensey Johns, this house was the home of the Chancellors of the State. . . 7. Known as the "Little Dutch House" the history of this cottage can be traced only to 1704, although it is undoubtedly somewhat older



AMSTEL HOUSE
A.D. 1730

OPIC
SEVAT

251











Conditions no better than this exist in thousands of houses. Replanning for efficiency offers opportunity for architectural ingenuity and FHA funds



PLANNING THE REMODELED KITCHEN

THE need for remodeling has been repeatedly paraded before the professional public. It has proved its advantages to both architect and client. But specific instances of partial remodeling and the details of modernization technique often have been passed over entirely.

Particularly is this partial remodeling adapted to kitchens and those accessory spaces which are included in the food service end of the home. Modern ideas of efficiency and space utilization do not demand that the kitchen be large enough to serve all the functions of living as it did in the day of the cabin. Modern economy requires maximum convenience in minimum space.

Some 90 to 95% of existing kitchens are obsolete, either in equipment or arrangement. Most old kitchens contain more space than can be utilized if the various equipment units are to be arranged in the proper relationship—so that their individual functions will become integral parts of the larger function of efficient food preparation. Here then, is an opportunity of creating from unnecessary areas, a pantry, laundry, dining space, maid's room, service lavatory, easily-accessible basement stairs, or a rear porch, in addition to improving the kitchen layout.

PLANNING ESSENTIALS

Theoretically the kitchen is an uncluttered work space proportioned to the number of persons active in it, surrounded by compact and well-integrated equipment. Practically, the problem is complicated by doors and windows and the necessary circulation.

The kitchen work area should be free from the interference of traffic to and from outdoors to the other rooms of the house. Passage doors should be reduced to a minimum number. The routine of kitchen work, and the arrangement of work centers for normal sequences of operation have been the subject of a concise and thorough analysis (see Household Kitchen Planning, Ref. Data No. 6, July, 1933 and Time-Saver Standards, Ser. No. 8, (C6.1.1.) "Household Kitchen Planning-Elements" Sept. 1935). The essentials of this analysis are well worth reviewing here as related to remodeling.

Kitchen activities are performed only partly in direct sequence, nearly every activity in the kitchen involves several operations. The several units of equipment should be arranged so that they will facilitate these overlapping and interrelated activities.

The bicycle-era kitchen satisfied both architect and client until long after the tandem had given way to the limousine



REPLANNING

In replanning the kitchen remember that the most generally efficient equipment-unit arrangement is in the form of a U containing in sequence from the outside door:

(1) A storage center, for raw materials, canned goods, etc., adjacent to refrigerator with work top for receiving and sorting supplies.

(2) A preparation center, with adequate work-top and cabinets for staples and utensil storage convenient to water supply and means of garbage disposal.

(3) A cooking center, including range and space for utensils used first at the range, conveniently located with relation to sink.

(4) A serving center, which should be adjacent to range as many foods go directly from range to serving dish.

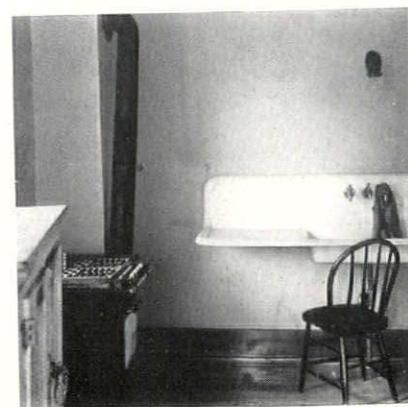
(5) A cleaning center, with a sink (frequently the same as is used for the preparation of foods), dishwasher, garbage disposal and places for usual cleaning agents. This should be located convenient to tableware storage. The sink in most small kitchens thus does double duty and its location in relation to other equipment is of utmost importance. The most accepted place is at the foot of the U underneath a window, sacrificing the advantage of storage space over the sink to the pleasure of having an outdoor view while at work there.

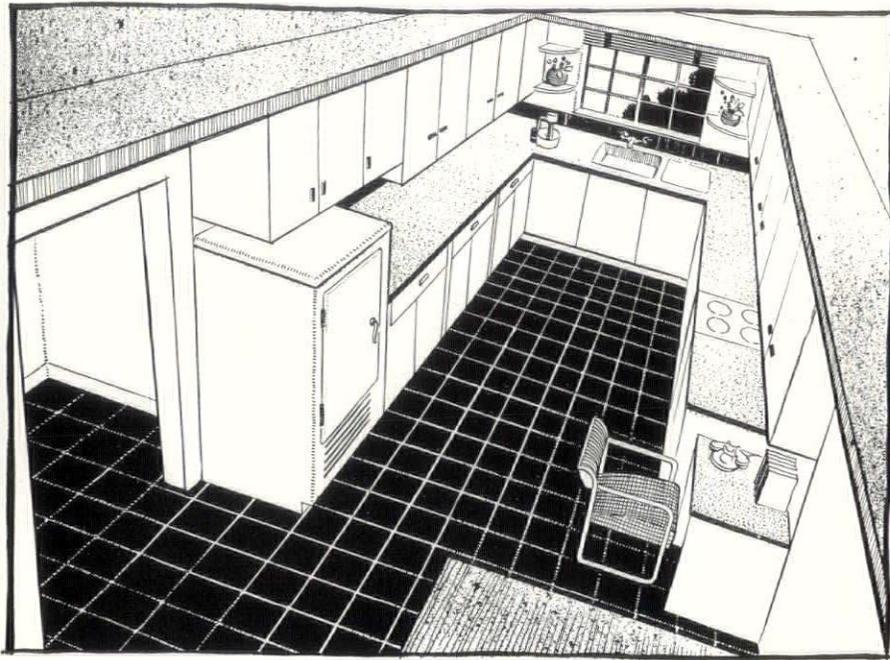
Storage facilities should be provided at each center and if necessary, utensils and condiments frequently used in different operations should be duplicated, for one of the cardinal rules in kitchen planning is to locate every tool near the work process of which it forms a part, or nearest the point of first use.

The ideal kitchen plan may not be possible under the limitations of existing conditions. The budget may restrict the moving of doors and windows. But much can be done with no structural changes by the installation of modern



Remodeled kitchen by Louis Andre Lamoreux, Architect, Mansfield, Ohio. Walls, Carrara glass; floor, rubber tile; cabinets, enameled steel. Note soffit lighting over sink and combination convenience outlets and under cabinet lights





The time-saving kitchen is demanded by the modern housewife who wants her work space as up-to-date as her motor car

equipment or the rearrangement of old; by modernizing plumbing, gas, and electrical connections, and by providing adequate light, ventilation and storage facilities.

In comparatively recent kitchen planning the location of the major equipment was predetermined by the general structure of the house. The refrigerator was placed in an outside vestibule for convenient icing; the range stood next to the chimney to provide the draft necessary for coal or wood fires; the sink located where the plumbing stacks carried to the second floor. Now these restrictions are removed—the mechanical refrigeration has moved inside, the modern range needs no flue, and the slight cost of extra plumbing does not dictate the sink location—and the work centers may be closely related to save needless steps and eliminate the confusion of unnecessary traffic.

Possibly, unless radical structural changes are made, the service into the house cannot be kept completely apart from the kitchen but it may be so directed that it does not interrupt the work sequence. Without great expense the work-centers may be established by the location of the major equipment. The range, with some counter surface for the placing of dishes during the serving period, may, in the absence of

a pantry, combine the functions of cooking and serving center. The sink with adjacent counters will serve for both preparation and cleaning. These and the storage center may be located at right angles on two walls, or, if the kitchen is narrow, on opposite walls. Other wall spaces may be left free for a table or tables or a cabinet unit if built-in storage space is too costly.

If the kitchen is so large that the working-space becomes excessive, a work table may be placed in the center of the space and used successively as part of each work center.

For the small home where space is at a premium, the pantry is unnecessary. While a pantry acts as a noise and odor buffer between kitchen and dining room, the modern



Range and refrigerator have changed places to simplify routine in this kitchen. Note cove base under sink unit, and metal corners protecting synthetic tile wainscot



well-appointed small kitchen is not ashamed to be seen or heard, and proper ventilation can eliminate odors.

If a pantry is desired, it should be a serving and dish storage center, providing dish and glass washing facilities. It may have a secondary refrigeration center for salad materials, bottled drinks, chilled desserts, etc. When, however, it is used primarily as a "buffer" between kitchen and dining room, its use as a dishwashing center may be objectionable, and where most of the china is kept in the kitchen for warming before service, and only glassware and silver and incidental tableware are stored in the pantry, a special glass and silver cleaning sink is provided here and all other cleaning is done in the kitchen. In the absence of a pantry, linens and glassware first used at the table should be stored when possible in the dining room.

NEW EQUIPMENT

The *sink* as the most used unit in the kitchen is usually the first to be replaced. Ideally it should be in a well-lighted focal point between the refrigerator and range.

The sink may be of porcelain enameled iron, Monel Metal or stainless steel alloy. Many sinks come already built into cabinet units and others may be adapted to built-in construction. If the undercabinets are to be job-built, care must be taken to select a sink which will join successfully to the cabinet work. Recently developed plastics and waterproof adhesives make the use of flat rim sinks without integral drainboards completely practical and permit the use of continuous work surfaces of the same material throughout the kitchen. Some local inspection codes prohibit the use of totally enclosed undersink units and such possible restrictions should be investigated before choosing this equipment. The sink should preferably have counters at each side for food preparation, and the stacking and draining of dishes; also handy storage space for cleaning agents.

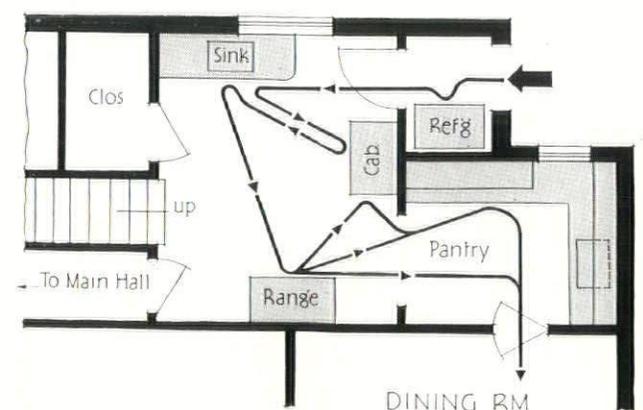
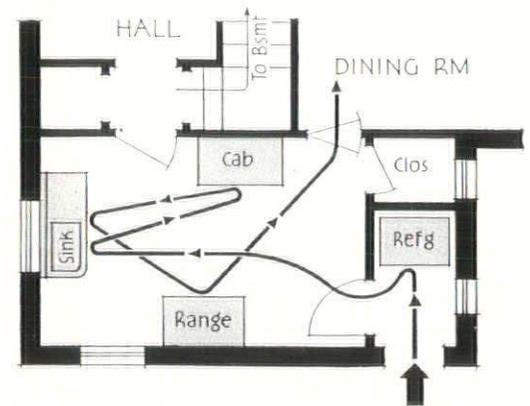
Dishwashing machines may be incorporated in the sink unit, or a portable machine which needs no permanent plumbing connections may be used.

Near the sink is an ideal location for the hopper to a built-in *incinerator*. If existing conditions prohibit the incinerator, an electric-powered destructor may be installed which permits all fresh food waste to be carried off through the soil line. A disposal system with access through an opening in the dish-stacking counter adjacent to the sink and removal from the outside may be a solution; or a garbage receptacle may be part of the cleaning center equipment.

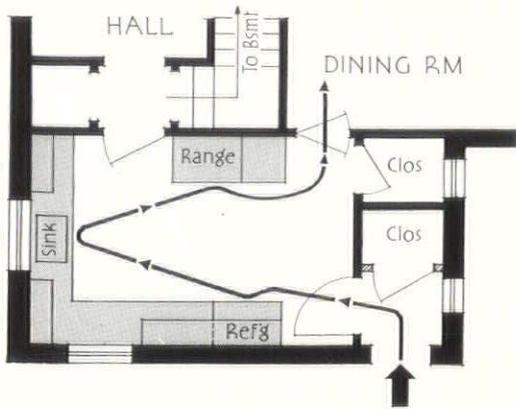
A *range* with the oven below the cooking top should be selected (table top or closed top type) if the kitchen is planned for continuous work surfaces at the same level. Some ranges may be set on a built-in cabinet after the legs have been removed thus furnishing additional pan storage space and effecting a reduction in the amount of new flooring material needed. The console type ranges have an oven more easily accessible but an oven higher than the cooking top obstructs light and prevents removing utensils easily from the range to adjoining counters.

The range, gas or electric, should be installed absolutely flush with adjacent cabinets, or sufficiently free-standing so that cleaning around it will be easy. The range should be so located that it is out of the path of direct traffic, that

THREE PLANS OF ACTUAL KITCHENS WITH SCATTERED EQUIPMENT AND UNRELATED WORK CENTERS. HEAVY LINE SHOWS TYPICAL WORK-PROGRESS ROUTE

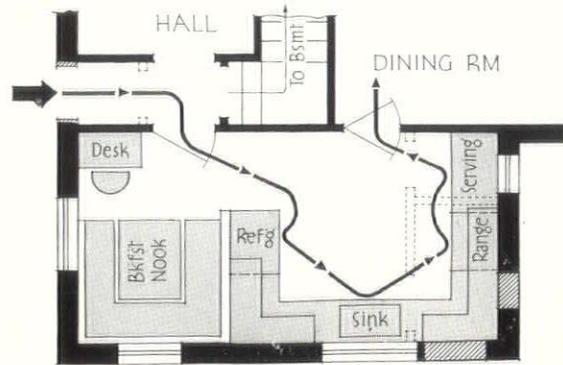


THE SAME THREE KITCHENS REPLANNED WITH MINOR STRUCTURAL CHANGES

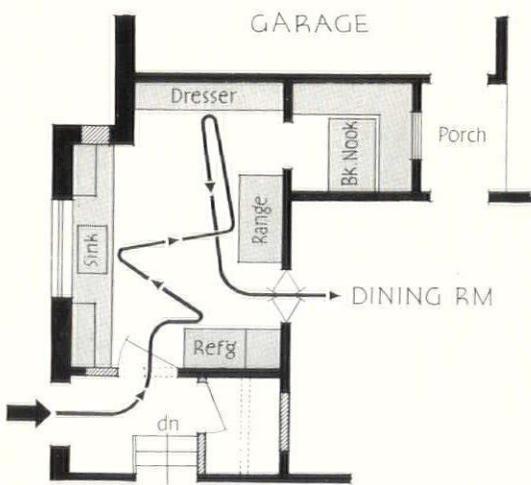


The refrigerator and sink are located in a continuous work surface, permitting easy transference of materials to preparation center. The range with adjacent serving counter is convenient to dining room door. Circulation into the main part of the house still crosses the kitchen but meal preparation routing is much simplified

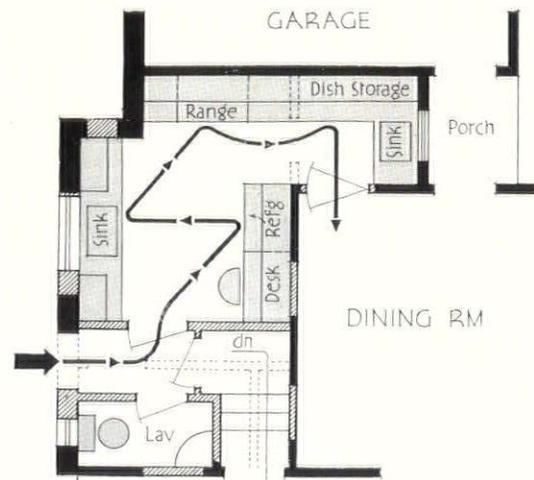
FURTHER IMPROVEMENT RESULTS FROM RELOCATING WALLS, DOORS AND WINDOWS



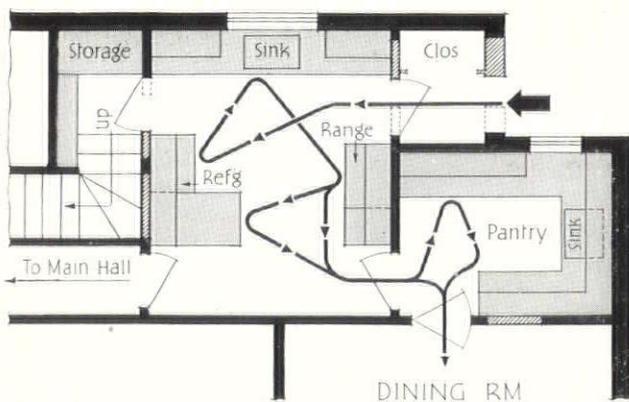
The kitchen routing is simplified, and the traffic into house is kept apart from the working area. A well-lighted dining space has been incorporated



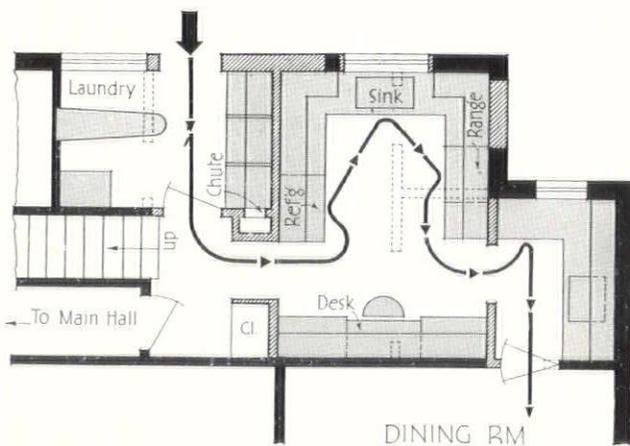
The refrigerator is convenient to the serving center but the door swings introduce mental hazards when using sink or serving center. The former storeroom has been converted into a dining alcove



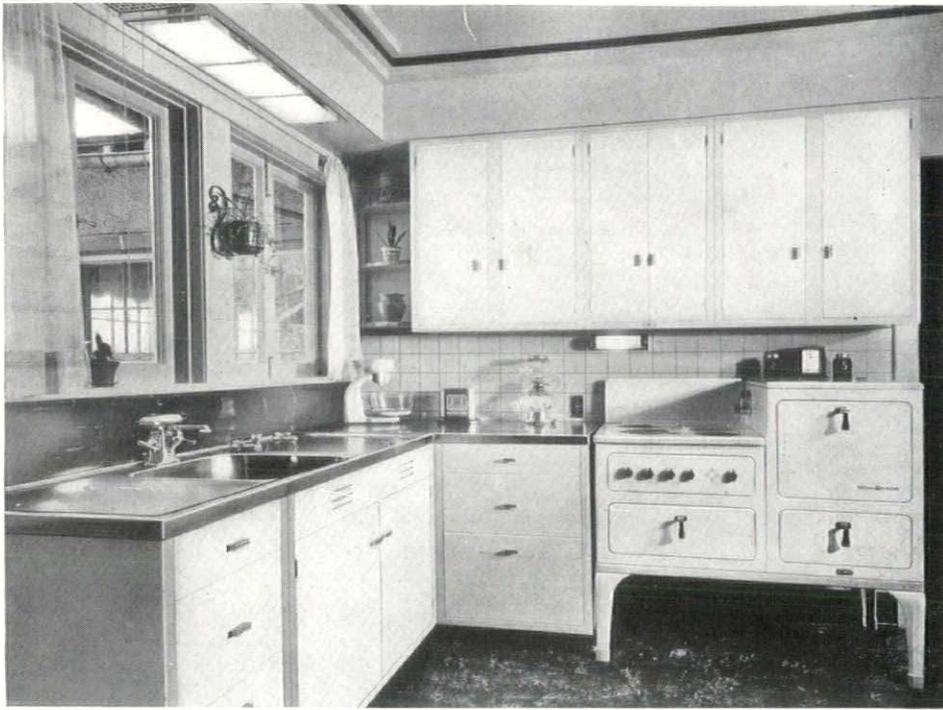
The old store closet becomes a serving center. The work space is compact and efficient, and room for a lavatory was found without added area



The sink, range, and refrigerator are located in better relationship to each other but the work centers are still too scattered. A center table might be used as additional work surface



The work area is compact and well integrated. Circulation to house no longer crosses kitchen. The space formerly occupied by kitchen now contains a laundry in addition



Elimination of storage closet door permitted continuous work top from sink to range. Note linoleum floor turned up into toe-space under cabinets, and ventilation through furred ceiling beam

Below:

This modernized kitchen has a continuous work surface of Monel Metal. Cabinets built to ceiling to eliminate any dirt-catching space above. The refrigerator was forced out of the U-shaped work area by an existing door

there is room to pass open range doors and drawers, and comfortably to use the oven and broiler. There should be an adjacent heat-proof counter top to receive hot utensils removed from the range. All ranges should be installed with 1" clearance between the back of the range and the wall to prevent discoloration due to the natural movement of heated air carrying dust and grease particles. The wall behind the range should be protected by a fire-retarding material. If wood base cabinets are used flush with the range face, they should be protected on the oven side with metal and asbestos or other insulating material. Cabinets over a range should be approximately two feet above the range top, and if of wood, should be insulated.

The modern gas range needs no flue but may be directly connected with a back draft diverter to a separate flue in an existing chimney. A 3" pipe is sufficient if well insulated. Piping directly from a range flue to the outside air involves the risk of back drafts in the oven. A flue connection carries out warm air and cooking odors. A range hood is seldom used in the small modern kitchen, but ventilation behind over-range cabinets will perform the same function as the flue (see below). The expense of piping or wiring changes is relatively so small that it is a mistake to locate the range inconveniently just to make use of existing gas or electric outlets.

The refrigerator may be placed at the right or left end of a continuous counter so that foods may be passed along to the food preparation center. It should be conveniently located near the service door. There should be sufficient storage space nearby for fruits, vegetables and foods that will be refrigerated before use. The door should be hung so that its swinging will not interfere with direct passage of food to the preparation center. All gas or electric refrigerators require ventilation, so clearance requirements of the model selected should be known before combining it into a cabinet unit. Gas refrigerators must have a clearance of 1½" between





Shifting the sink and adding metal cabinets for adequate storage organized this kitchen. Floor, linoleum; work surfaces, metal; sink, porcelain iron

Below:

An irregularly shaped kitchen improved by well designed equipment with no structural changes. Note convenient serving counter adjacent to range



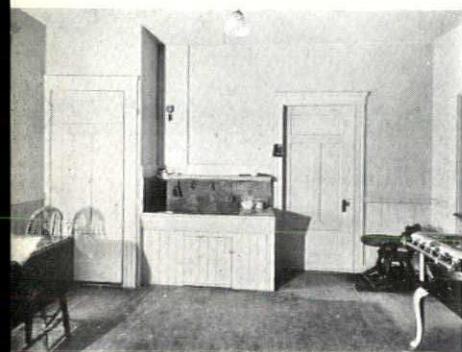
back of box and wall and, unless the bottom of wall cabinet is kept at least 8" above the top of the box, a flue 3" or more in depth and the width of the box should be constructed from its top to a grille above the cabinets. Most electric models require 2" clearance on at least one side of unit and about 12" clearance over the top.

STORAGE

Materials and utensils of considerable size range must be kept at their proper use point. Cabinets may be mill-constructed to match existing equipment (which may be salvaged and remodeled) or stock cabinet units may be used. Stock cabinets in enameled metal, or in wood, with easily cleaned flush doors completely equipped with hardware, vary in depth from 24" to 26" for under-counter cabinets, and 12" to 14" for above-counter cabinets. Most metal cabinet companies furnish filler strips so that adjustments up to 4" in the overall length dimensions may be made. All cabinets below working surfaces should be set on recessed bases to provide a toe space 4" deep by 3" or 3½" high. Unless the counter top has considerable projection such toe space is mandatory to insure against an uncomfortable working position. The accepted height for working tops is 36" but this may be varied slightly to align with existing equipment. Counter height over stock cabinets may be increased or decreased by varying the height of the toe space.

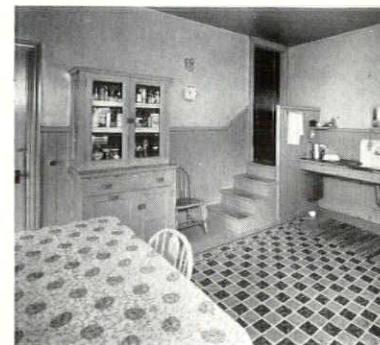
The amount of storage is usually controlled by the wall space which may be used for this purpose, and unless the kitchen is overlarge, it is hardly likely that too much can be provided. Fixed units are preferable to movable ones in that they reduce the wall and floor areas to be refinished. Built-in construction is best for cleaning efficiency, and eliminating dust-catching floor spaces. The continuous counter-top simplifies kitchen routine and sanitation.

Food storage requirements may vary with the marketing habits of the housewife, but storage of utensils and table-



In this modernized kitchen the location of the major equipment was not changed. Individual equipment units were used to effect organization at minimum cost. The wainscot is of composition tile-board, and the floor of linoleum

The major equipment in this large kitchen was compactly and conveniently arranged, though the work space is interrupted by circulation. Additional cabinets and work surface near the refrigerator would simplify sorting and storing of supplies



ware can be approximated from the number of people customarily served. (See Time-Saver Standards, Serial No. 37). Tableware storage should be located convenient to both cleaning center and dining room so that replacement after washing becomes a matter of a few steps. Linen storage may be in pantry or dining room. Napkins and table cloths may be stored in drawers 6" to 8½" in depth or on closely spaced shelves. Table pads require a space of 8" to 10" in depth. Flat silver should be stored in compartment drawers 2" to 3" high lined with velvet, cork or linoleum. Provision should be made for the storage of large and small trays in compartments divided by a series of thin vertical partitions.

WORK SURFACES

Work surfaces should be waterproof, easily cleaned and impervious to the acids and greases encountered in kitchen work. If of wood, they should be well-oiled ash or maple, of the "glued-up" type, or of teakwood which contains a natural oil and needs neither varnish nor oil. Work surfaces may also be of linoleum, rubber tile, processed wood-fiber, phenolic resin compounds, stainless steel alloys, Monel Metal, porcelain or ceramic tile. With the exception of porcelain and special fabricated linoleum with steel backing, these materials require a solid wood underframe.

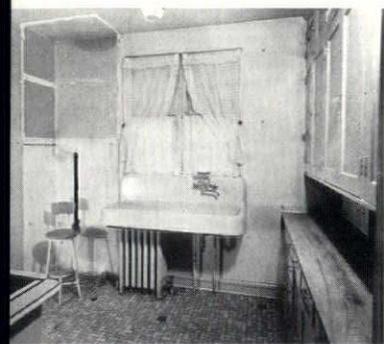
Linoleum and compressed wood-fiber tops are cemented to a laminated plywood core and are particularly adapted to forming continuous surfaces for moderately priced work. Various types of metal and self-material mouldings have been developed for use as edgings and at the wall or backsplashes for building a leak- and crack-proof surface. A cutting board must be provided, either as a slide, or as a wood-topped section of cabinet, if linoleum or rubber counters are used, since these materials are damaged by cutting. Rubber work surfaces must be cleaned promptly as the destructive chemical action of grease is injurious to them.

Metal tops which make excellent work surfaces should be provided with a ground wire to absorb any possible shock which might develop from a short circuit in any of the electrical equipment.

Acid and stain resisting porcelain tops are available in lengths up to 84". Mastics, such as are used with linoleum and rubber, can be used to obtain waterproof joints with adjacent materials.

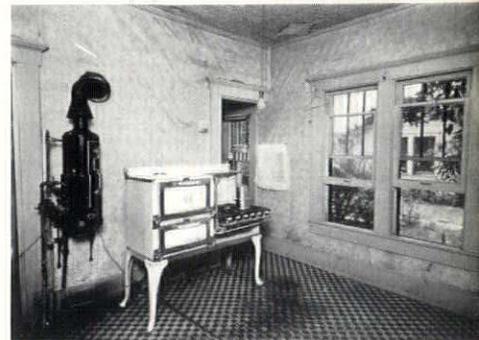
ELECTRICAL CHANGES

The proper placing of convenience and power outlets must be considered in remodeling. All-electric kitchens may have a power load of 12 to 15 kilowatts and several circuits must



No structural changes. Note the decorative use of ceramic tile, concealed radiator, and wood cutting-top, the sink and cabinets of metal

A metal sink unit combined with wood cabinets modernize this well-lighted kitchen. Wood sheathing used over old plaster on walls and ceiling



be provided to carry the refrigeration, lighting, dishwasher, fan, clock and the numerous portable devices. These should be so arranged that none can be overloaded by the simultaneous operation of more units than they are designed to serve. If an electric range is contemplated, an additional separate power circuit is necessary.

A check list of possible outlets and their locations and approximate capacities is given on page 88.

LIGHT, VENTILATION AND HEATING

In the small kitchen one window is usually sufficient. The sill height may vary from 3'2" to 3'10", depending upon height of work surface splashback.

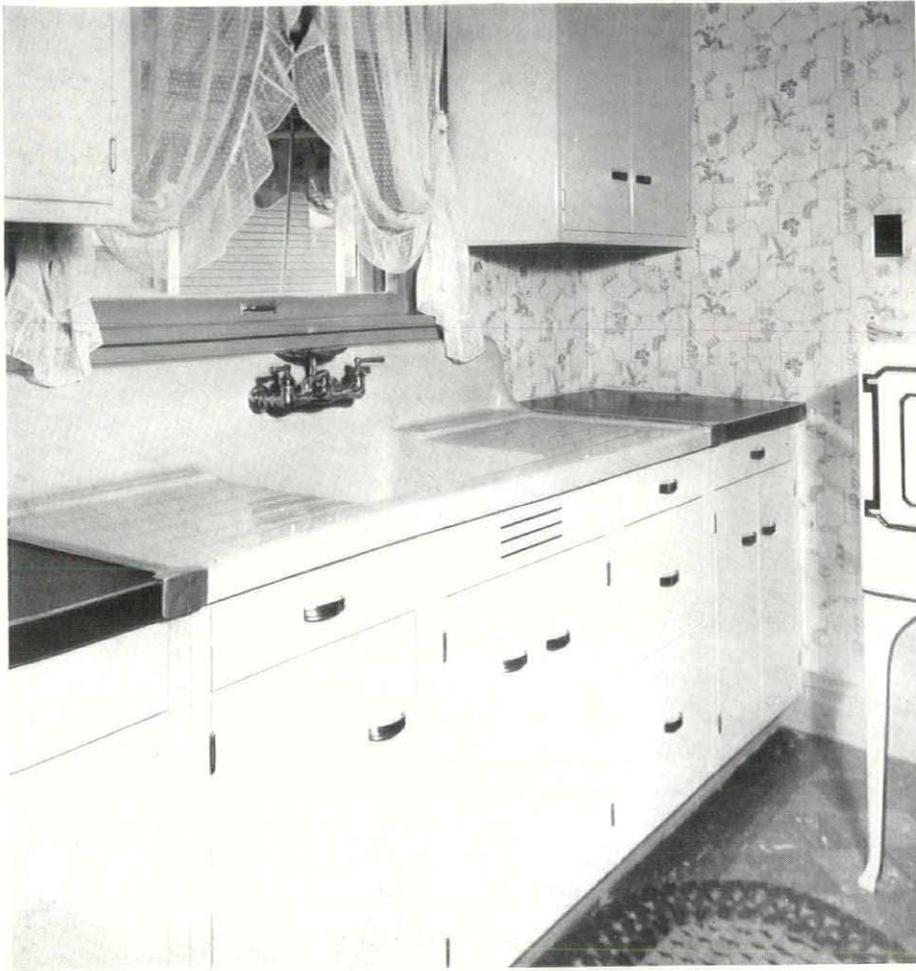
Controlled mechanical ventilation has become almost a necessity in the modernized kitchen. The fan should not be placed over a window as it will recirculate incoming air when the window is open. It may be placed over the range to assure maximum air movement at that point. With a furred ceiling-beam as a plenum, the fan may be located at any convenient point assuring cross-ventilation from the window, but the plenum space must be fireproofed against the possibility of combustion of grease-laden dust by a smooth lining of asbestos or metal. Discharge to outer air should be so located that odors will not reënter other windows.

Heating, whether by radiator or register, should not disturb a logical arrangement of equipment. If possible, the location of register or radiator should be determined after all kitchen equipment is placed. In remodeling work this location may be somewhat arbitrarily determined but care should be taken not to locate the heating unit where the warmed air cannot be directed away from any position which might be used as a work center. A radiator might be located back of the sink with a grille above the splash-back or back of a towel drier in a vented cabinet at either side of the sink.

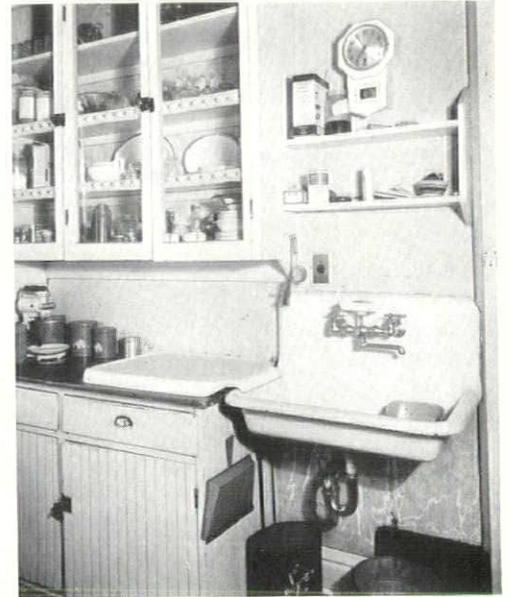
Laundry work should be kept apart from the kitchen but if no laundry is provided and the basement is poorly lighted many housewives prefer incorporating this not continuously used equipment in the kitchen. A hinged ironing board can be provided on a storage cabinet door or otherwise located so that it may be used in an unobstructed light. Provision might also be made for a mangle.

FINISHES FOR WALLS AND CEILINGS

Built-in cabinets in the modernized kitchen reduce the amount of wall space to be refinished and permit the use of relatively high priced wall coverings. Many materials that may be applied on existing walls have the requisite qualities of sanitation, resistance to soiling and staining, durability



The sink in this kitchen has been shifted to an adjacent wall for better lighting. The sink of porcelain enamel has under cabinets of enameled metal



and decorative value and give a more stain-proof surface than paint or enamel.

Linoleum-type wall coverings and the asbestos and fiber finish-boards over old plaster require little preliminary work. If the covering is to be attached with a plastic compound any previous wall covering (or such finishes as water paint, whitewash, etc.) must be removed and the surface scored to give tooth for bonding. These materials may be cemented as a finish over smooth-surface-wall boards. Building boards of laminated layers of paper or paper pulp, or spongy, loose-pressed fiber boards absorb too much of the adhesive for satisfactory bonding but may be covered by rigid synthetic finish-boards nailed or screwed in place.

Ceramic tile, structural glass, and the laminated plastic compounds, require more preparation preliminary to installation but their permanence and non-absorptive qualities are advantages. In applying tile or structural glass over old plaster the thickness of both setting bed and material must be taken into consideration.

Kitchens may be wainscoted with scored wall boards simulating tile. These come in sheets 4 ft. wide and 4 to 8 ft. in height, and with sufficient insulation they may be applied directly on standard wood framing, thus obviating plaster if a new wall is erected in the course of remodeling.

Flooring materials are being used on walls and ceilings since the improvement of metal clips for covering raw edges

and constructing tight joints. Metal trim is available in clip-on or drive-on sections for covering joints after surface material is erected. All types have concealed screws and anchorages and make a clean, modern installation.

For proper light diffusion, ceilings should be kept white or very light in tint. Relative high humidity and the need of occasional cleaning make oil paints or enamels desirable. Matte finish diffuses light better than glossy.

FLOORS

Resilient flooring materials are most satisfactory, as wood floorings have dirt-catching joints and are difficult to maintain. Hard floorings of masonry are tiring to stand upon. Linoleum has won widespread acceptance. Asphalt tile is to be preferred over any sub-floor of concrete which cannot be kept absolutely dry. Rubber tile is not easily stained and is not absorptive, but, like asphalt tile, is permanently injured by grease and oils if they are allowed to remain on long.

A cove base should be provided for ease of cleaning. With linoleum, the floor covering itself may be carried over a wax or wood fillet to form the cove, and extend up into the toe space beneath base cabinets and built-in equipment.

ACKNOWLEDGMENTS. Photographs through the courtesy of Consolidated Gas Company, page 73; General Electric Company, bottom of pages 74, 75 and top of pages 78, 80 and 81; International Nickel Company, bottom of page 78 and top left of page 80; Jones & Kirkland, Inc., bottom of page 79; Crane Company, top right of page 79.



COURTESY, PHILADELPHIA GAS WORKS

TIME-SAVER STANDARDS

HOUSEHOLD KITCHEN DATA

1•Kitchen Fixtures

2•Kitchen Cabinets

3•Kitchen Utility Connections

ALSO••Geometry of the Human Figure

Household KITCHEN EQUIPMENT

PURPOSE

Tabulated in this sheet are approximate critical dimensions of kitchen and pantry sinks, dishwashers, ranges and refrigerators. These dimensions may be used for preliminary planning purposes but must be checked against manufacturers' data before final drawings are made. For dimensions of cabinets see T.S.S. "Household Kitchen Cabinets."

SOURCE OF DATA

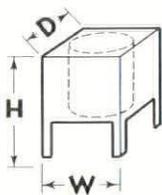
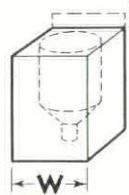
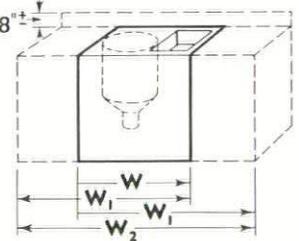
Dimensions have been drawn from the current catalogs of leading manufacturers of each type of equipment. Odd sizes and special equipment have been neglected and no consideration has been given to the dimensions of obsolete models. Dimensions are given only to the nearest quarter inch and, wherever possible, units of approximately the same size have been combined. This is necessary because dimensions of new models change from year to year, but are not likely to vary materially beyond the range of dimensions indicated herein. No dimensions are given for vitreous china sinks. Variations in the manufacture of these units are too wide to permit tabulation in practical form. For preliminary purposes, use dimensions of enameled iron sinks.

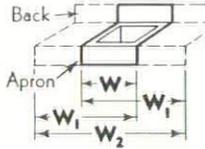
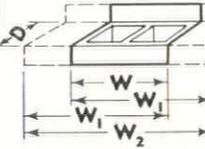
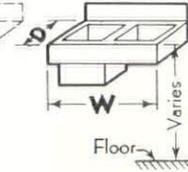
CLEARANCES

All mechanical refrigerators, both gas and electric units, require ventilation space around the cabinet to permit functioning of the condensers. Average clearance requirements are indicated in the accompanying diagrams. Manufacturers' data should be consulted for minimum clearances where space limitations are severe.

Clearances around ranges required for fire safety vary with character of both the range and adjacent construction. American Gas Association recommendations are: 6" from wall and at sides if wood or plaster and stud construction surfaces are not covered with fire-resistive material and range is not of insulated construction; 3" at back and sides if adjacent surfaces are protected but range is not of insulated construction; flush contacts permitted all around if surfaces are protected and range is of insulated type. Provide recess or space for draft diverter and flue connection where required by flush construction.

Door swings on refrigerators, ranges, cabinet sinks and cabinet-type dishwashers, should be checked against manufacturers' data after units have been tentatively selected. Usually side-hinged doors, as on refrigerators, can be obtained on order to swing on either hand.

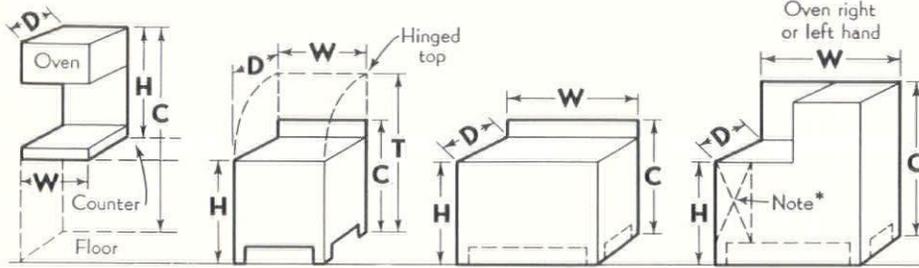
DISHWASHERS				
				
TYPE A Portable Washer Round or Square	TYPE B Built-in Washer	TYPE C, C₁, C₂ Washer and Sink with or without Boards		
DATA and DIMENSIONS				
TYPE	No. of Drain Boards	Width W, W ₁ , W ₂	Depth D	Height H
A	None	1'-10 ³ / ₄ " to 2'-0"	1'-10 ³ / ₄ " to 2'-0"	2'-10 ³ / ₄ " to 3'-2"
B	None	1'-11" to 2'-4"	2'-0" to 2'-1"	3'-0"
C	Over washer	3'-6" to 4'-0"	2'-0" to 2'-1"	3'-0"
C ₁	1	5'-1" to 5'-2"	2'-0" to 2'-1"	3'-0"
C ₂	2	6'-7 ¹ / ₂ " to 6'-8"	2'-0" to 2'-1"	3'-0"

SINKS					
					
TYPE A Single Compartment Boards Right or Left Hand	TYPE B Double Compartment Boards Right or Left Hand	TYPE C Laundry-tray and Single Sink R. or L. Hand			
DATA and DIMENSIONS					
TYPE	Height of Back	Height of Apron	No. of Drain Boards	Width W, W ₁ , W ₂	Depth D
METAL SINKS					
A	8"	7"	1	3'-5" to 4'-1 ¹ / ₂ "	1'-9 ¹ / ₄ "
A	8"	7"	2	5'-0" to 6'-0"	1'-9 ¹ / ₄ "
B	8"	7"	2	6'-10 ¹ / ₄ "	1'-9"
ENAMELED IRON SINKS					
A	None	None	None	1'-0" to 1'-6"	1'-0"
A	None	None	None	1'-8"	1'-2"
A	None	None	None	2'-0"	1'-4" to 1'-8"
A	None	None	None	2'-6"	1'-6"
A	None	None	None	3'-0"	1'-6" to 1'-10"
A	Varies	Varies	None	2'-0"	1'-4" to 1'-6"
A	Varies	Varies	None	2'-6"	1'-6" to 1'-8"
A	Varies	Varies	None	3'-0"	1'-6" to 1'-10"
A	Varies	Varies	None	3'-4"	1'-8"
A	Varies	Varies	None	3'-6"	1'-10"
A	Varies	Varies	1	3'-6" to 4'-4"	1'-10"
A	Varies	Varies	1	4'-4"	2'-0"
A	Varies	Varies	1 or 2	5'-0"	1'-10" to 2'-10"
A	Varies	Varies	2	6'-2"	1'-10" to 2'-0"
A	Varies	Varies	2	6'-6"	1'-10"
B	None	None	None	2'-8"	1'-8"
B	None	None	None	3'-6"	1'-10"
B	None	None	None	4'-0"	1'-6"
B	Varies	Varies	None	3'-6"	1'-10"
B	Varies	Varies	None	4'-8" to 5'-0"	2'-1"
B	Varies	Varies	1	5'-0"	1'-10"
B	Varies	Varies	2	6'-7"	1'-10"
C	None	None	Over tray	3'-6"	2'-0"
C	None or 8"	None	Over tray	4'-2"	2'-1"
C	8"	8"	Over tray	3'-1" to 3'-7"	1'-10"
C	8"	8"	Over tray	4'-4"	2'-0"
PORCELAIN SINKS					
A	None	None	None	3'-0"	1'-10"
A	None	None	None	3'-6" to 4'-0"	2'-0"
A	9"±	8"±	None	2'-0"	1'-8"
A	9"±	8"±	None	2'-6"	1'-10"
A	9"±	8"±	None	3'-0" to 3'-6"	2'-0"
A	9"±	8"±	1	3'-6"	1'-9"
A	9"±	8"±	1	4'-4"	2'-0"
A	9"±	8"±	2	5'-0"	2'-2"

Household KITCHEN EQUIPMENT

Serial No. 35
FEBRUARY 1936

RANGES

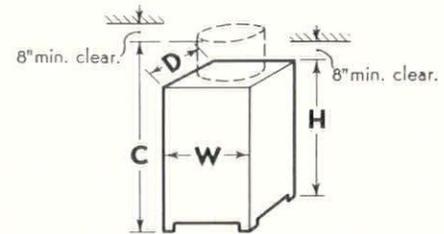
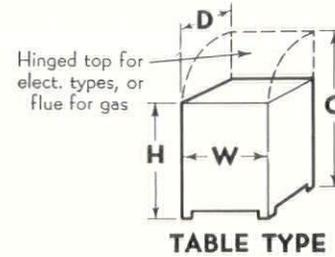


COUNTER TYPE A **TYPE B** **TYPE C Built-in** **TYPE E Built-in**
TYPE D with Legs **TYPE F with Legs**

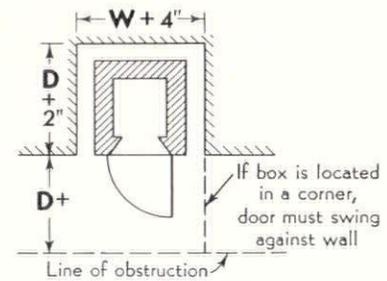
A and B are for use in apartments and kitchenettes

REFRIGERATORS

GAS and ELECTRIC



FLAT OR MONITOR TYPE



PLAN - BUILT-IN

GAS Range Data

Size of Family	TYPE	No. of Burners	No. of Ovens	Width W	Depth D	Nominal Height H	Shelf Height C	Hinged Top Clearance T
SMALL	A	4	1	2'-0"	2'-2"	3'-0"	6'-0"±	—
	B	3	1	2'-2" to 2'-6"	1'-5" to 2'-0"	2'-8 1/2" to 3'-0"	3'-0" to 3'-4"	3'-11" to 4'-7"
	B	4	1	1'-8" to 2'-1"	1'-10" to 2'-3"	2'-9" to 3'-1"	3'-1" to 3'-4"	3'-10" to 4'-7"
	F	4	1	3'-0" to 3'-6"	2'-0" to 2'-3"	2'-8" to 2'-11"	3'-4" to 3'-11"	—
MEDIUM	D	4	1	3'-0" to 3'-11"	2'-0" to 2'-6"	2'-11" to 3'-1"	3'-2" to 3'-9"	None
	F*	4	1	4'-1" to 4'-7"	2'-3" to 2'-5"	2'-9 1/2" to 2'-10 1/2"	3'-7" to 4'-0"	
	F	4	1	3'-6" to 4'-2"	2'-1" to 2'-6"	2'-10" to 3'-1"	3'-8" to 4'-2"	
LARGE	D	6	1	3'-4" to 4'-2"	2'-2" to 2'-4"	2'-11" to 3'-1"	3'-5" to 3'-10"	None
	D	6	2	3'-4 1/2" to 3'-9 1/2"	2'-2 1/2" to 2'-5"	3'-0" to 3'-2"	3'-6" to 4'-3"	
	F	6	2	4'-5" to 5'-8"	2'-0" to 2'-4"	2'-10" to 3'-1"	4'-5" to 5'-3"	
	D	8	3	3'-6" to 4'-2"	2'-2" to 2'-6"	2'-11" to 3'-1"	3'-4" to 3'-10"	

* NOTE: Gas room heater (circulating type) included.

ELECTRIC Range Data

Size of Family	TYPE	No. of Units	No. of Ovens	Width W	Depth D	Nominal Height H	Shelf Height C	Total Kilowatts
SMALL	B	2-3	0-1	1'-3" to 1'-8"	1'-10" to 2'-1"	3'-0"	3'-4 1/2"	3.3 to 7.9
	B	3	1	1'-6"	2'-0"	3'-0"	4'-0"	7.0
	D	3	1	3'-3 3/4"	1'-10 1/2"	2'-8"	3'-3 3/4"	5.8
	F	3	1	3'-3 3/4"	1'-10 1/2"	2'-8"	3'-3 3/4"	5.8
MEDIUM	D	3-4	1	3'-0" to 3'-2"	1'-11" to 1'-11 3/4"	3'-0"	3'-4 1/2" to 3'-6 5/8"	6.9 to 8.56
	D	4	1	3'-6"	2'-1"	3'-0"	3'-7"	8.2
	E	4	1	3'-8 3/8"	2'-0 5/8"	2'-8"	3'-11 1/2" to 4'-5 1/4"	9.9
LARGE	C	4	1	3'-6"	2'-1"	3'-0"	3'-7"	8.5
	D	4	1	3'-6"	2'-1"	3'-0"	4'-5"	11.5
	E	4	1	3'-9"	2'-2 1/4"	3'-0"	4'-7 1/2"	9.7
	C	4	2	3'-6"	2'-1" to 2'-3 1/2"	3'-0"	3'-8" to 4'-0 1/4"	12.5 to 14.92
	D	4	2	3'-6"	2'-1"	3'-0"	4'-5"	14.87

REFRIGERATOR Data

Approx. Capacity Cu. Ft.	Width W	Depth D	Height	
			H	C
4	2'-0 1/4"	2'-2 1/4"	4'-8 1/2"	5'-1 3/4"
5	2'-3 3/4"	2'-5 1/2"	5'-0 1/2"	5'-5 1/4"
6	2'-5"	2'-2 1/2"	5'-1"	5'-4 1/4"
7	2'-5 1/2"	2'-6 1/2"	5'-4 1/2"	5'-7 1/4"
8	2'-7 3/4"	2'-5"	5'-1 1/4"	—
9	2'-10 1/4"	2'-4"	5'-6 1/4"	5'-8"
10	3'-9"	2'-6"	5'-4 1/2"	—
12	3'-3"	2'-6"	5'-3 3/4"	—
13	3'-10 3/4"	2'-6"	5'-5"	—
15	3'-10 3/4"	2'-6"	5'-5"	—
18	3'-10 1/2"	2'-4 1/2"	5'-11 3/4"	—
20	4'-3"	2'-6 3/4"	6'-4"	—

Under normal conditions allow a minimum of 2 cu. ft. per person.

Household Kitchens—STOCK CABINETS

PURPOSE

Critical dimensions of the principal types of stock kitchen wall and floor cabinets are indicated in the accompanying drawings and tables. These dimensions should be used only for preliminary planning purposes and manufacturers' data consulted before developing final drawings.

The approximate amount of storage space required for china, glassware, trays, etc., is also indicated in the table below.

STORAGE SPACE NEEDED

Modern kitchen planning demands adequate storage space at each work center to accommodate the supplies, utensils, condiments, etc., first used at that work center. See Time-Saver Standards (C6.1.1) "Household Kitchen Planning—Elements" (Serial No. 8, September 1935). The amount of space required for food storage varies with the number of persons regularly served from the kitchen, the extent to which guests are entertained at meals and the marketing habits of the family. Obviously, day by day buying requires less storage facilities than marketing once or twice a week. Storage of utensils, china, glassware and similar equipment can not be precisely related to the size of the family or its entertaining needs, but an approximate indication of the space needed for such equipment is given in the table below, (based upon a special study made for American Architect by Good Housekeeping Institute) and in the following rule:

RULE 1. To estimate space required for tableware storage: Storage for complete table service for 12 people, including china, glass, linen and silver, without duplications or reserve space, requires six feet of wall space fitted with standard cabinets as follows: (a) upper cabinet with 3 shelves, 12" deep, totaling 18 linear feet of shelving; and (b) floor cabinet with

2 shelves (floor and 1 shelf) 20" deep totaling 6 lineal feet. Add allowances where possible for duplications and miscellaneous articles. The total wall space and shelving indicated may be divided as necessary to provide storage of separate items nearest the point of first use. Tableware for less than 12 people requires almost the same space, unless dishes are nested.

STOCK CABINETS

Most manufacturers of wood and metal cabinets offer above-counter units in three or four widths and in three heights. Under-counter or base units are made in widths to correspond with over-counter cabinets and in heights which vary according to whether or not a toe space and top are integral with the cabinet units. It is usually possible to find a combination of base cabinets and top which will permit the fabrication on the job of a toe space base that will bring the work surface to any desired height from two feet ten inches to three feet or more.

Full height cabinets or side units serving as broom closets, clothes closets or for the storage of special utensils or equipment are usually made in widths corresponding to one- and two-door wall cabinets and in overall heights which will align with normal combinations of bases and over-counter cabinets.

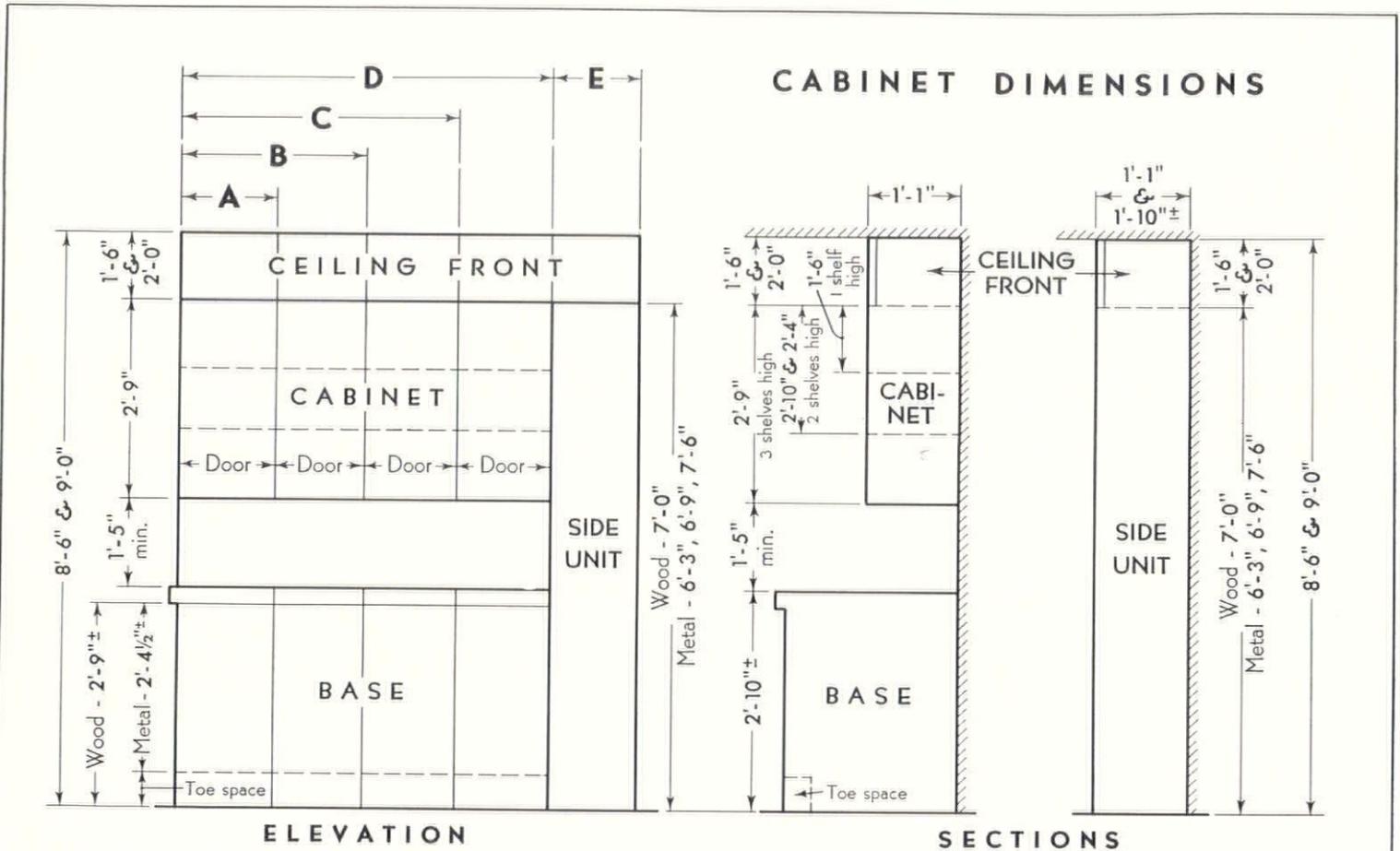
FITTING TO ODD DIMENSIONS

Manufacturers usually provide corner fillers to carry cabinets around right angle corners. Fitting of combinations of cabinets to wall dimensions which are not an exact multiple of the unit widths offered, can usually be accomplished by the introduction of fillers or adapters fitted on the job or by stopping the cabinets short of doorways or windows and revealing clear wall space at these adjustment points.

TABLEWARE STORAGE — In Kitchen and Pantry Cupboards and Cabinets					
TABLEWARE	Lineal Feet of Shelf Space		TABLEWARE	Lineal Feet of Shelf Space	
	In Wall Cabinets with Shelves 12" Deep	In Floor Cabinets with Shelves 20" Deep		In Wall Cabinets with Shelves 12" Deep	In Floor Cabinets with Shelves 20" Deep
CHINA			GLASSWARE		
12 Service Plates	1'-0"		12 Tumblers 2¾" to 3" diameter	10" to 12"	
Dinner Service for 12 - 4 sizes of plates. Demi-tasse service and related china.	5'-6"	1'-6" for platters	12 Grapefruit Bowls 5" diameter	1'-6"	
Luncheon Set for 12 - Plates, cream soup plates and related china.	1'-4"	1'-6" if platters are not same as for dinner service	12 Sherbet or Champagne Glasses 3½" diameter	1'-4"	
Breakfast Set for 12 - Coffee, eggs, cereal, cream and sugar, etc.	2'-6"	See note below for trays	12 Cocktail or Wine Glasses 2¼"	8"	
Tea Set for 12	3'-0"	See note below for trays	12 Cordial Glasses 1¾"	4"	
Salad Service, Glass or China for 12	8"	1'-0" for bowl	12 Finger Bowls - stacked	6"	
			12 Celery-Olive Comports	8" or more	
			1 Punch Bowl 3¾ gal.		1'-6" each
			1 Pitcher, Decanter, etc.	6" each	
			Vases, Candlesticks, etc.		Variable
Note: Cups in above sets are assumed to be stored in stacks of 4 saucers and 4 cups nested on top.					
STORAGE FOR TRAYS			DRAWER HEIGHTS		
Small Trays: Provide in upper cabinet or between counter and upper units a series of thin vertical partitions 1" apart to receive small trays.			For Flat Silver: 2" to 3" high, fitted with silver racks or with division strips front to rear 2" and 3" o.c.		
Large Trays: Provide in lower cabinet a series of thin vertical partitions 1½", 2" and 3" on centers to receive large trays. Wire racks may be used to form partitions.			For Doilies: 2" to 3"; for Mats, Runners, etc., 3" to 3½"; for Napkins, Table Cloths, etc., 6" to 8½"; for Table Pads, 8" to 10".		

Household Kitchens—STOCK CABINETS

Serial No. 36
FEBRUARY 1936



TO USE THE CHART	HORIZONTAL DIMENSIONS		
	TYPE	WOOD CABINETS	METAL CABINETS
<p>A cabinet of wood, with one door, may be 1'-3" or 1'-6" wide (see A). If it is one shelf high, the vertical dimension will be 1'-6"; two shelves high, 2'-0" or 2'-4"; three shelves high, 2'-9".</p> <p>For metal cabinets use same dimensions unless dimensions for metal are specifically indicated.</p> <p>For cabinets with 2, 3 or 4 doors, use horizontal dimensions B, C, or D as required.</p>	A (1 door)	1'-3", & 1'-6"	1'-2 1/2", 1'-4 1/2", 1'-6"
	B (2 door)	1'-8", 1'-10", 2'-0", 2'-6", 3'-0"	2'-0", 2'-2", 2'-3 1/2", 2'-6", 3'-0", 3'-6"
	C (3 door)	3'-4", & 3'-6"	None
	D (4 door)	4'-0", & 4'-6"	None
	E (side unit)	1'-1", 1'-3", 1'-6", 1'-9", 2'-0"	1'-6", 2'-0", 2'-6"

TYPES OF UNITS AVAILABLE		
BASES	CABINETS	SIDE UNITS
<p>Drawers - Wide, medium, or narrow, for cutlery, kitchen utensils, bread, cake, linen, cleaning materials, etc.</p> <p>Boards - for bread, pastry, or meat</p> <p>Bins - for flour, vegetables, pots, or miscellaneous storage</p> <p>Tops - with or without work-tops</p> <p>Fronts - open, doors, grilles</p> <p>Combination and Separate Ranges, Refrigerators, and Sinks</p>	<p>Doors - Glazed, solid, or omitted; Panelled or Flush</p> <p>Brackets - with or without end brackets to support cabinets on bases independently of the wall</p> <p>Shelves - Fixed or adjustable</p> <p>Drawers - may be obtained in bottom of cabinet for kitchenettes</p>	<p>Utility closets</p> <p>Dish closets</p> <p>Broom closets</p> <p>Linen closets</p> <p>Ironing board and broom closets</p> <p>Miscellaneous storage, or any combination of above; with drawers or shelves, or both.</p>

Household Kitchens—Connections to UTILITIES

PURPOSE

There is a greater concentration of water, gas, electric and heating connections in the modern kitchen and pantry than in any other part of the average residence. The accompanying diagrams and tables provide a check list of these connections to utilities.

Not all of the outlets and connections shown on this sheet are required in any individual kitchen; the list is comprehensive and is intended to serve as a "reminder" check list rather than as a list of mandatory or required connections. The drawings are purely diagrammatic in character and should not be construed to represent ideal arrangements.

PLANNING REQUIREMENTS

For principles of modern kitchen planning see T.S.S. (C6.1.1) "Household Kitchen Planning—Elements" (Serial No. 8, September, 1935). Insofar as project conditions permit, both in modernization and new work, kitchens or pantries should be organized in harmony with the principles established in the above sheet. The six basic work centers constituting the elements of a modern kitchen plan are referred to herein in establishing the location of various outlets and connections.

CAPACITIES, SIZES, LOADS

Pipe sizes for water and gas connections shown in the accompanying table are based on normal practices but are subject to wide variation. Water pipe sizes should be studied in relation to prevailing pressures, desired rate of flow, and kind of pipe. For rapid filling of vessels and quiet flow through pipes, large sizes are advisable; for economy of water and some saving in installation costs, smaller sizes are permissible but do not make for convenient working conditions.

Sizes of gas piping should be established in consultation with the local utility company supplying gas. They vary according to length of run, gas pressure, and consumption of device. Sizes indicated in table are ample for normal branches from risers or mains, but if two or more devices are supplied from

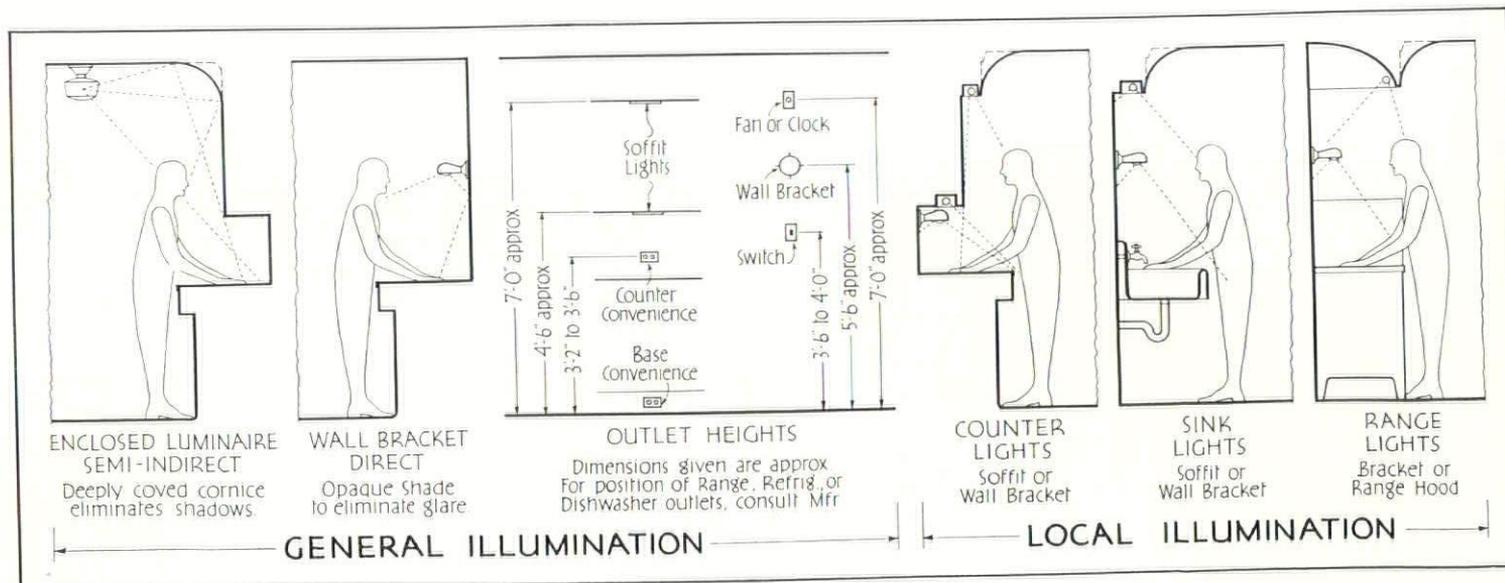
the same branch, or if branches are very long, larger sizes may be needed.

Electrical loads indicated in the accompanying check list are based on the prevailing range of equipment sizes and capacities now manufactured by leading suppliers. Lighting loads are estimated; if light sources are of built-in type with flashed opal glass panels, the higher wattages may be required for uniform distribution of lighting. Standard luminaries and wall brackets usually permit use of the lower wattages indicated.

ELECTRICAL CIRCUITS

Single convenience outlets for known loads generally may be grouped in circuits designed to carry the total operating load of the devices they serve. Motor-driven appliances, particularly electric refrigerators and electric dishwashers, have high momentary starting loads ranging from 1000 to 1500 watts. Where possible, they should be served by separate circuits so that the coincidental starting of two or more motors, or the starting of a motor when an appliance or lights are operating on other parts of the same circuit, will not cause an overload. It is not advisable to have double convenience outlets serving a miscellany of mixers, toasters and other portable appliances in the same circuit with a modern electric refrigerator. Portable kitchen appliances in use today may draw from 500 to 1000 watts each, hence a normal 15 amp. lighting or convenience outlet circuit may be fully loaded by two appliances in simultaneous operation.

All heavy duty and special outlets should be served by separate circuits designed to carry the load of the devices installed. Consult manufacturer of appliance for exact rating, and National Electric Code and local building codes for circuit requirements. As a protection against shock in the event any appliance becomes short circuited in use it is advisable to provide for grounding metal work tops to a nearby water pipe. Polarity outlets are also desirable for equipment drawing over 600 watts.



Dimensions of the HUMAN FIGURE

PURPOSE

These diagrams show the dimensions and clearances required by the normal adult human figure. They constitute the foundation for planning many elements of building and furnishings.

NORMAL DIMENSIONS

The dimensions given on this sheet are based upon the average or normal adult. They should be construed as minimum and should never be reduced. When permissible, the clearances indicated should be increased to allow comfortable accommodations for larger-than-normal persons.

The height of tables, desks, work tops and sewing counters deemed best for normal persons is subject to controversy. The height of table tops shown in these diagrams is 2' 5"; some authorities and many furniture manufacturers prefer 2' 6" or sometimes 2' 6½".

Since doorways and passage-ways must normally be dimensioned to permit the movement of furniture through them, they should seldom be designed merely on the needs of the normal adult. See Time-Saver Standards (to be issued) relating to furniture sizes.

Children do not have the same bodily proportions as adults, especially during their early years, but an approximate indication of their space requirements can be gained from the accompanying table.

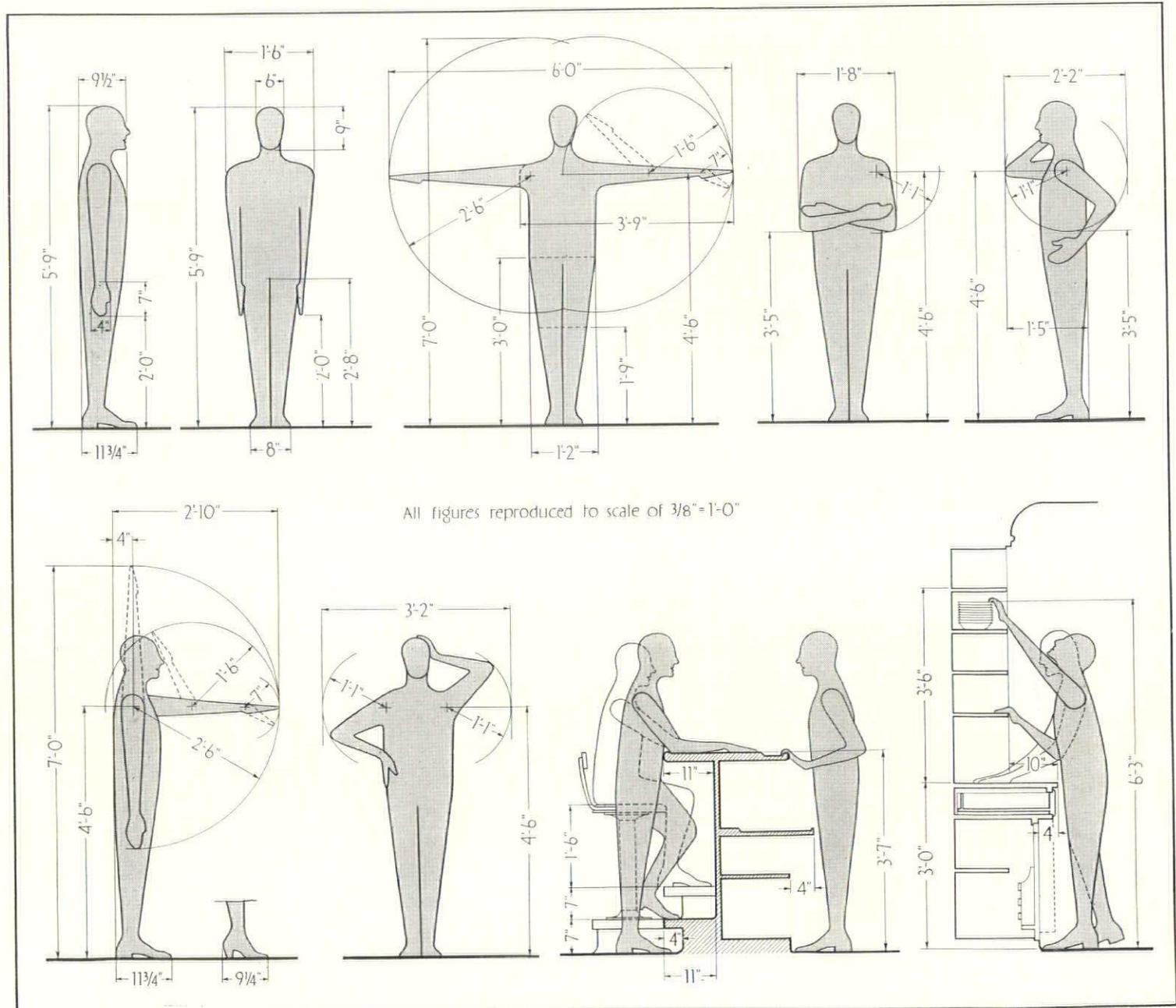
SOURCES

These diagrams are redrawn from "The Geometry of the Human Figure" by Ernest Irving Freese (American Architect, July 1934). Data on children's requirements are adapted from "Houses Are for Children, Too," by Ruth Leigh, Charles G. Ramsey and Harold R. Sleeper. (American Architect, Nov. 1932.)

AVERAGE HEIGHT OF CHILDREN

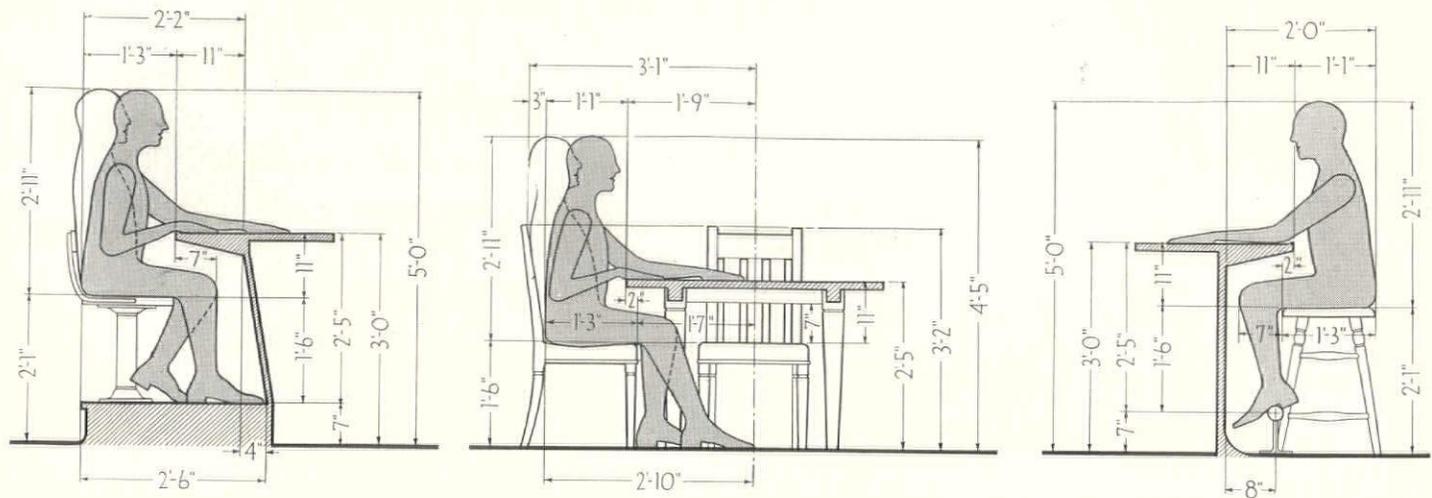
Age in Years	Average Height	% of Normal Adult Height	Chair Heights*	Table and Desk Heights
5	3' 3"	56%	1' 0"	1' 10"
7	4' 0"	70%	1' 2"	2' 1"
9	4' 4"	75%	1' 3"	2' 2½"
11	4' 8"	81%	1' 4"	2' 4"
13	5' 0"	87%	1' 5"	2' 5" or 2' 6"
15	5' 4"	93%	1' 5"	2' 5" or 2' 6"
17	5' 7"	97%	1' 5"	2' 5" or 2' 6"

* As approved for school use.

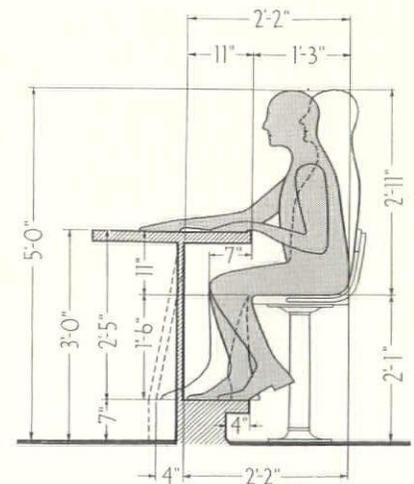
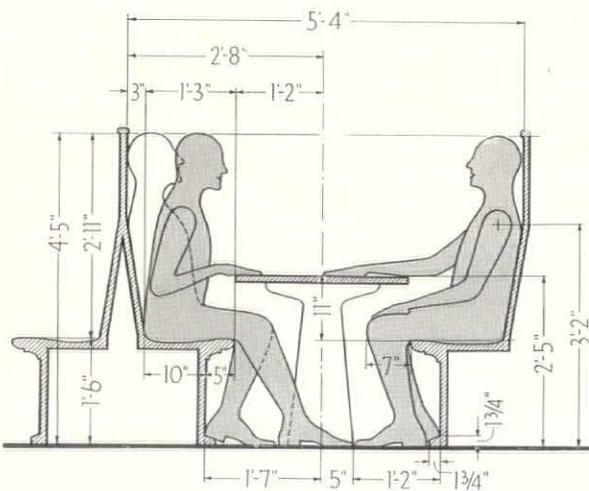
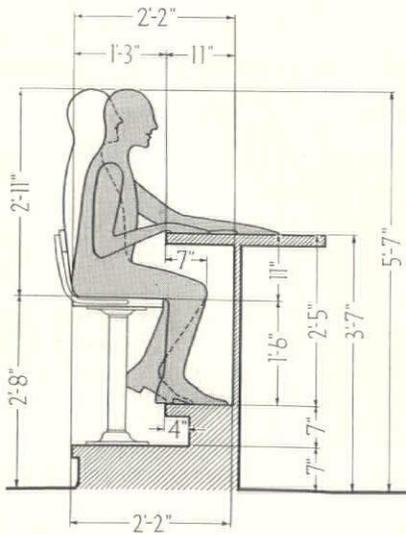
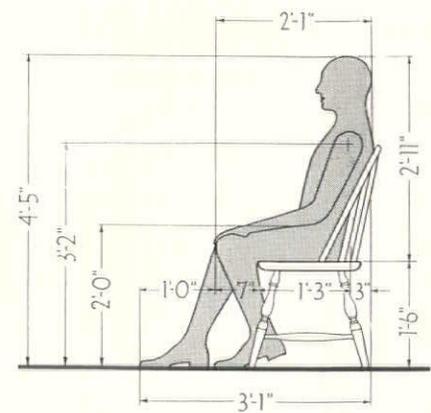
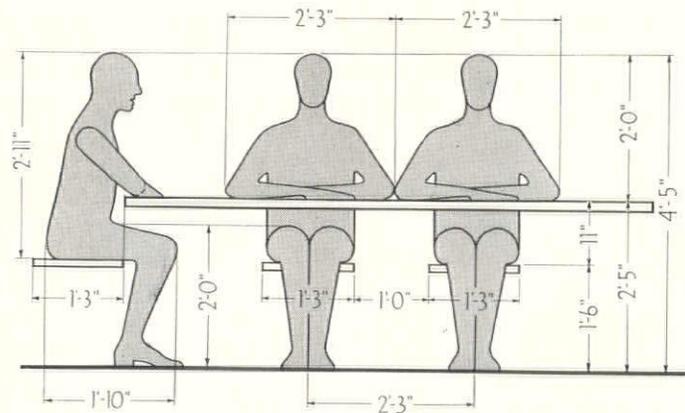
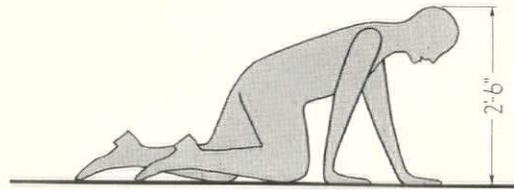


All figures reproduced to scale of 3/8" = 1'-0"

Dimensions of the HUMAN FIGURE



All figures reproduced to scale of 3/8" = 1'-0"





I M P R O V E M E N T S

WITH THIS ISSUE the symbol for Time-Saver Standards takes a new form, smaller, unobtrusive, more distinguished, harmonizing with the distinctive typography recently developed by American Architect.

- It is evidence of the refinements which are constantly sought to improve these Standards. Neither format nor content will remain static so long as experience shows better ways to increase the usefulness and desirability of this unique service.
- If you have suggestions for improvement, please send them to the Director of Technical Service. If you have developed standards of your own that are real time-savers, let us study them for the benefit of others. Time-Saver Standards are published for you; tell us how you like them; what data you need in this condensed reference form; how we can improve their presentation to increase their value.

NEW TRIPLE-INSULATED HOUSE CONSTRUCTION

Since 1930 a vast amount of scientific research has been undertaken within the building industry in an effort to bring about a practical solution to the small house construction problem. The leading manufacturers of building materials and equipment have been especially active in this research program to discover new construction methods and to develop new materials that would meet the increasing demand for better homes within a reasonable price range.

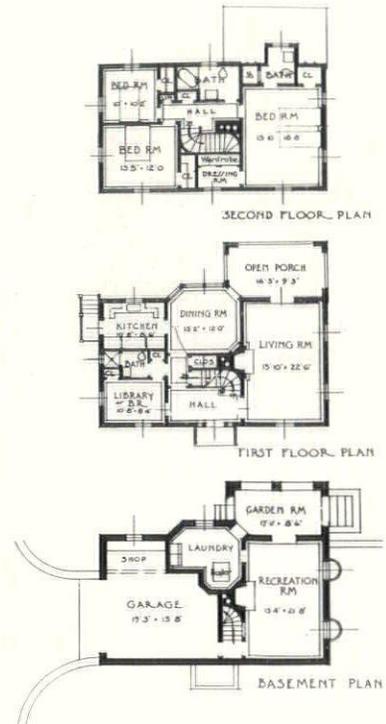
Recognizing the apparent need for improved materials, the engineers of the Johns-Manville Research Laboratories began an intensive study of the problem. Their development work was based on the principle that the ideal achievement would be a completed wall and roof structure, produced at a reasonable cost, which would first, assure permanency against deterioration due to the weather; second, offer protection against destruction by fire; third, which would act as a barrier against the passage of cold and heat through the walls; without in any way sacrificing good architectural design on the outside or decorative possibilities within. They have produced a method of construction which offers the advantages of a triple-insulated house.

As a result of this laboratory research various products were developed which used in combination, make possible this new three-way construction method. In order to fully demonstrate the materials and their structural relationship, a model home was erected at New Rochelle, N. Y. in December 1935. The principal features are: *First*, J-M Asbestos Shingles and Siding for the exterior walls. In color and texture the shingles and siding closely resemble ordinary wood shingles and siding. Being constructed of asbestos and portland cement they are rot-proof and fire-proof.



Johns-Manville "Triple-Insulated" model house
New Rochelle, N. Y.

Hall & Paufve, Architects; Oscar A. Ettari, Builder

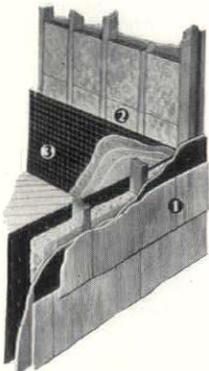


Second, the hollow wall space is filled with J-M Rock Wool Insulation which is fireproof also and thus acts as an effective firestop; *Third*, the plaster on the interior is applied directly to J-M Steeltex, a metal lath. The combination of plaster and metal lath gives the strength of reinforced concrete construction, and thus practically eliminates the possibilities of cracked walls and falling plaster. *Fourth*, the roof is constructed of J-M Asbestos Shingles, which are rot- and fire-proof, and under this shell is a blanket of Rock Wool insulation laid upon the attic ceiling. This type of construction with the triple-insulation features described, has the obvious advantage of being adaptable to any type of dwelling as it does not involve any unproved or unfamiliar method of construction. These materials are the development of a single manufacturer and can be easily obtained in all sections of the country.

STRUCTURAL MATERIALS

1. Detail of Triple-Insulated construction, showing application of J-M Asbestos Shingles, Rock Wool Insulation, Steeltex for interior walls.
2. Applying J-M Steeltex metal lath to the ceiling. Steeltex is a wire mesh backed with heavy kraft paper.
3. J-M Marbleized Asbestos Wainscoting being applied to the door frame and used as the baseboard. The wall is J-M Flexboard.
4. Applying J-M Asbestos Roofing Shingles.
5. Detail showing texture of J-M Asbestos Shingles which have the appearance of wood shingles.

1.



2.



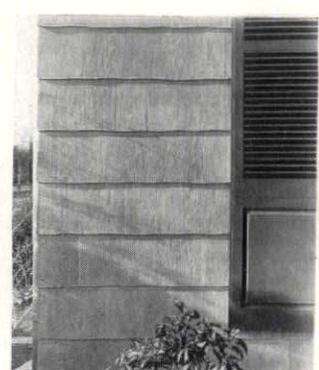
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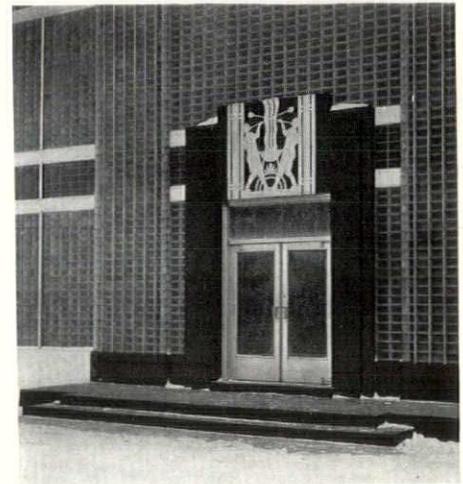
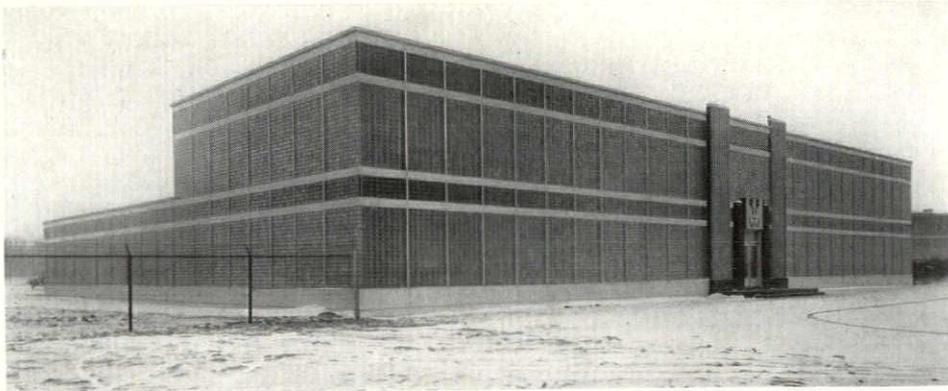
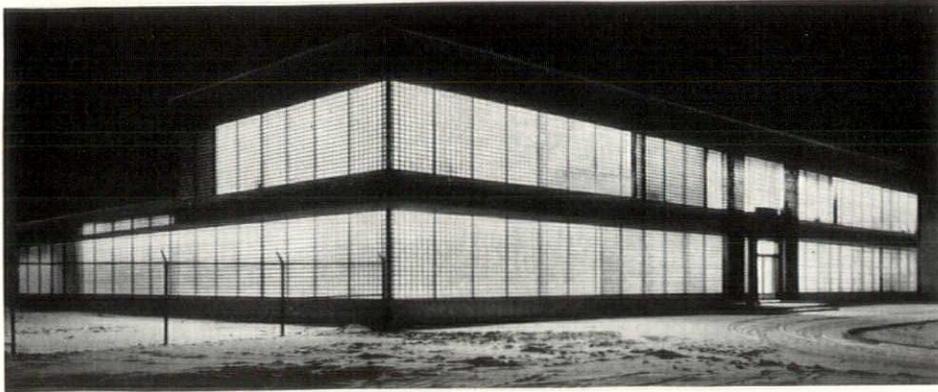


5.



TECHNIQUES

METHODS • MATERIALS • RESEARCH • PRACTICES



Built entirely of glass blocks in a new style of architectural design, this new research laboratory of the Owens-Illinois Glass Company at Toledo, Ohio, points the way to a new trend in industrial building construction. Above, is the entrance. The design over the door is aluminum depicting the old-time method of bottle blowing. At the top left, the building illuminated at night. Walker and Weeks, Architects.

NEW INDUSTRIAL BUILDING WITH GLASS BLOCK WALLS

The practicability of glass block units as a structural material for many types of buildings, and especially for industrial types, is no longer a mere matter of theory. After years of intensive study and experimenting, research engineers and chemists have developed a structural glass unit which in every way meets the requirements of a sound and practical building material.

The Owens-Illinois Glass Company has been one of the leading pioneers in the development of this type of material. Extensive research and tests of glass units for building purposes had been conducted by the engineering department of Purdue University in co-operation with the Owens-Illinois Company. To prove their faith in their own product and to demonstrate the adaptability of glass block unit construction for buildings, the Owens-Illinois Company have recently completed the erection of, what is said to be, the first all-glass and windowless building. The new building will house their packaging research division at Toledo.

The building is two stories high, has 39 rooms and a total floor area of 20,000 square feet. This all-glass building introduces an entirely new trend in architectural design for industrial buildings. The exterior walls and all interior partitions are constructed of glass block units. Approximately 80,000 units were used in the construction of the building. It is a significant fact that not a single block was broken in handling from the time they left the company's industrial material plant in Muncie, Indiana, until they were finally put into place on the building. This fact has been pointed out by the Owens-Illinois Company as proof of the strength of the units and the ease with which they can be handled. The possibility of loss through breakage in transportation and handling during building construction is reduced to a minimum. No special equipment or unusual method is required for laying these units. They can be successfully laid by ordinary brick masons, as was done in erecting the Toledo building. The hollow, water-clear glass units

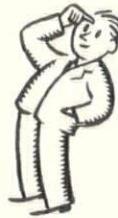
are translucent but not transparent. They are light in weight as compared with other types of masonry materials. They weigh less than 4 pounds per unit or 15 pounds per square foot. The total weight of the 80,000 units used in constructing the Toledo building, was approximately 300,000 pounds.

Although there are no windows in the entire building, there is an abundant flow of light, soft, perfectly diffused daylight, throughout the structure. It is said that as much as 86.5 per cent of exterior light can be transmitted through these glass units, the rays perfectly diffused.

The roof is insulated with glass wool against heat and cold flow and for acoustical properties, while the air conditioning system uses glass wool air filters to keep out dust and dirt. An abundance of fresh, pure air is supplied to all parts of the building.

This type of glass wall construction, eliminating the necessity for heavy, solid wall surfaces without sacrificing privacy, has unlimited possibilities in design and undoubtedly points the way to a new trend in industrial building design and construction.

3 Facts

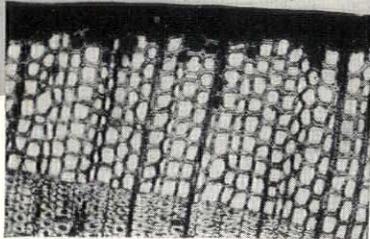


**about house paint
every Architect and
Maintenance Man should know**



1

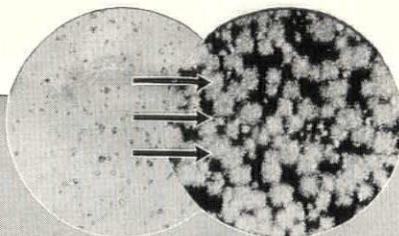
PAINT FILM →



What Causes Paint Failures?

Good paint must hold tenaciously to the surface it is applied to. Otherwise it will crack and peel. Pure White Lead in oil wins in competitive paint tests because white lead is a *chemically active pigment*. Microphotograph above shows why Pure White Lead in Oil sticks like glue. Note anchorage of the oil in the wood. White Lead in Oil actually becomes an integral part of the wood — an integral part of former paint films. It does not crack or peel off. Wears only by a slow, even chalking process.

2



What Gives a Paint Long Life?

A scientific camera shows why Pure White Lead gives longer service than any other paint known. White lead is a *chemically active pigment*. See how particles (a) "blossom out" when linseed oil is added (b). White Lead and oil become an elastic, homogeneous film that remains soft and pliable—does not crack when wood shrinks or stretches. When paint pigments are inert, there is no such blending of pigment and oil. The paint film is brittle — it cracks and peels.

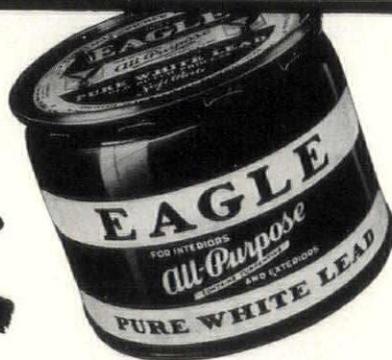
3



Master Painters Choose White Lead

"What kind of paint did you use on your own home the last time you painted it?" To this question, in an impartial survey, 86% of Master Painters answered "Pure White Lead in Oil." Their choice is significant. Their selection of Pure White Lead — the paint with *chemically active pigment* — was based on first-hand knowledge that white lead wears longer — is more economical than any other kind of paint.

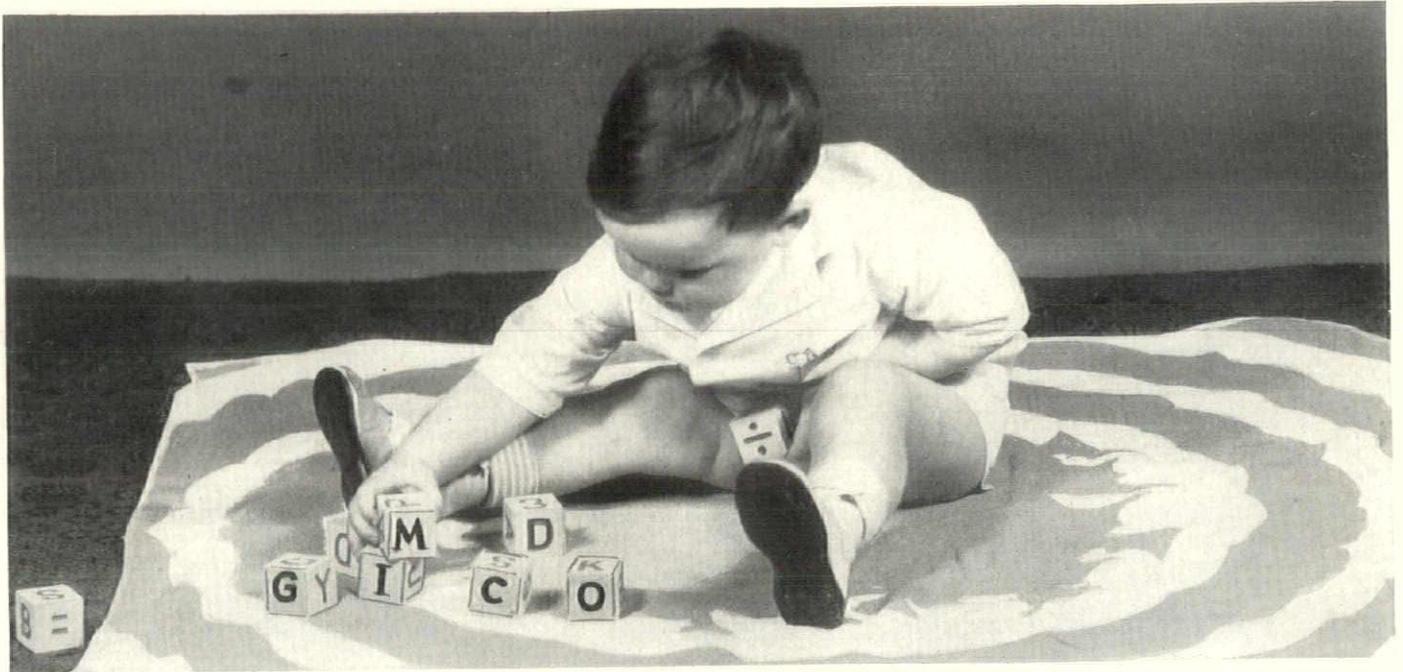
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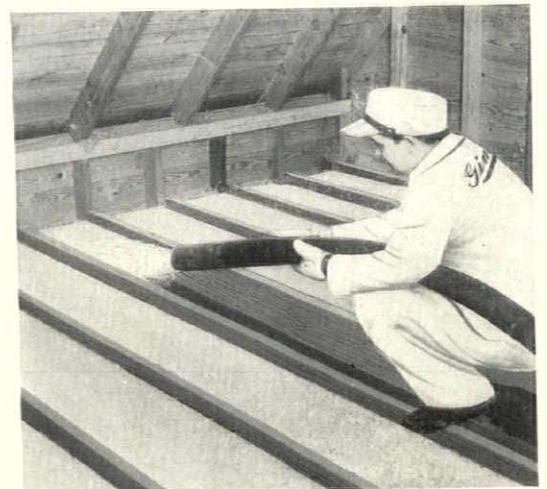
Architects specify Gimco Rock Wool because it is outstanding in efficiency and quality. For over a quarter of a century Gimco engineers have concentrated exclusively upon producing the finest insulation that skill and modern manufacturing methods can fabricate. Our sole aim is that the name Gimco shall typify the ultimate in home insulation.

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The same high quality that characterizes Gimco Sealal is built into Gimco Granulated Rock Wool (for application by pneumatic method) by the same painstaking processes. Gimco Granulated is free from "shot" and may be easily, efficiently applied to almost any construction.

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NEW CATALOGS...

Readers of AMERICAN ARCHITECT may secure without cost any or all of the manufacturers' catalogs described on this and the following page by mailing the prepaid post card printed below after writing the numbers of the catalogs wanted. Distribution of catalogs to draftsmen and students is optional with the manufacturers

Interior Finish Units

882 . . . A handsomely prepared 32-page, filing-sized booklet has been issued by Wood Conversion Company, St. Paul, Minn., which illustrates a large variety of applications of Nuwood Tile, Plank and Wainscot in homes, churches, schools, theatres, stores, restaurants and other places. Description of each unit and sizes available are also given.

Permaflexor Lighting

883 . . . Pittsburgh Reflector Company, Pittsburgh, has issued a 56-page, pocket-sized booklet which catalogs the Permaflexor line of silvered glass reflectors for show window lighting, cove lighting, direct and indirect lighting, floodlighting, and color lighting. Dimensions and prices are given for each unit.

Fans

884 . . . The complete line of electric fans for domestic, commercial and industrial applications, manufactured by The Emerson Electric Mfg. Co., St. Louis, Mo., are presented in Catalog X1149. Included are illustrations and descriptions of air circulators, ceiling fans, ventilating fans, and exhaust fans.

Cast Stone

885 . . . A portfolio containing data sheets giving details, specifications and technical data on cast stone has been issued by The Cast Stone Institute, Chicago. Subjects covered include cast stone as forming, cast stone ornamentation, stairways, details, copings, remodeling stone fronts, color in cast stone, and studies of various small post offices. Filing size; A. I. A. File 8-C.

Fireplaces

886 . . . Suggestions on proper methods of fireplace construction are contained in a 16-page booklet (Catalog No. 11) issued by The H. W. Covert Company, New York. Data also include illustrations and descriptions of Covert dampers and specialties, a suggested drawing of chimney, specifications, and details and photographs of various typical treatments of fireplaces. Filing size; A. I. A. File 14-E-2.

Medium Sealair Weight-Hung Window

887 . . . Specifications, typical details, installation data and methods of glazing

on the new Kawneer Medium Sealair Weight-hung Window in aluminum or bronze are given in a four-page catalog recently issued by The Kawneer Company, Niles, Mich. Filing size; A. I. A. File 16-E-1.

Rolling Grilles

888 . . . Kinnear Manufacturing Company, Columbus, Ohio, has issued a four-page catalog which illustrates and describes Kinnear Rolling Grilles. Construction details and methods of installation and operation are fully presented. Clearance dimensions and a suggested specification are also given. Filing size; A. I. A. file 35-P-8.

Asphalt Roofing

889 . . . "Facts About Roofing," a new 52-page illustrated manual issued by the Flintkote Company, New York, gives a wealth of information about asphalt roofings. The opening pages are devoted to an interesting discussion of the manufacturing processes used in making Flintkote roofing. The following section lists the names, types, general specifications, and brief descriptive facts about Flintkote Roofing Products. A few of the colors available are shown in natural reproduction.

Asbestos Wires and Cables

890 . . . A new 16-page filing-sized catalog is being distributed by The National Electric Products Corporation, Pittsburgh, giving specifications, engineering data and illustrated construction details for its line of National asbestos wires and cables.

Heating and Air Conditioning

891 . . . A portfolio of catalogs and engineering bulletins containing data on the line of heating and air conditioning products manufactured by The Bryant Heater Company, Cleveland, is now available. These products include the Bryant Dualator, humidifier, gas boilers, automatic flue-damper, warm air conditioning units, conversion burners, boiler controls, silica-gel dehumidifier. Complete descriptions, illustrations, dimensions, ratings and other pertinent data are given for each product.

Floor and Wall Tiles

892 . . . Hanley Company, New York, has issued a 12-page catalog which gives complete data on its line of tiles for floors and walls. Typical designs and standard colors available are illustrated and described for Flame-tinted, Even-tone, Quarry and Ceramic tile. Also included are tables and diagrams of standard sizes and shapes and general specification data. Filing size; A. I. A. 23-A.

Concrete Forms

893 . . . The important phases of form construction that apply especially to architectural concrete are described and illustrated in a new 64-page, filing-sized manual issued by Portland Cement Association, Chicago. Sections of the booklet are devoted to structural design of forms, erection accessories, detailing, kinds and grades of lumber, form linings, wood and plaster waste moulds, metal forms and moulds, typical forms, erecting, estimating. The booklet concludes with details of a typical job.

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AMERICAN ARCHITECT, New York

February, 1936

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These NEW Catalogs may be obtained through

AMERICAN ARCHITECT

Mercury Vapor Lamp Fixtures

894 . . . The new 28-page bulletin issued by Benjamin Electric Mfg. Company, Des Plaines, Ill., gives complete data on its new 400-watt High Intensity Mercury Vapor Lamp—how it operates, its color composition and its advantages—for various types of interior and exterior illumination. Descriptions, illustrations, dimensions and list prices on Benjamin lighting fixtures for this lamp, with tables of illumination calculations and a method of designing a general lighting system with these fixtures, are also included.

Kitchen Planning Guide

895 . . . A new 40-page kitchen guide designed for consumer use has been issued by Crane Co., Chicago. It includes floor plans, cabinet dimensions, scaled worksheets for laying out plans according to room arrangement, a variety of illustrations of well-planned kitchens and many types of modern sinks and labor-saving appurtenances.

Service Station Pits

896 . . . Marnall Steel Company, Inc., New York, has issued a 6-page, filing-sized broadside which describes the advantages of the Marnall Servis-Pit for service stations.

Asbestos Siding Shingles

897 . . . Johns-Manville, New York, has issued a six-page broadside giving data on cedargrain asbestos shingles designed for use as siding for houses, and illustrating typical installations.

Traveling Grate Stoker

898 . . . Recent improvements in details in the Coxe Traveling Grate Stoker and its drive are described in a 16-page booklet (Catalog No. C-5) issued by Combustion Engineering Co., Inc., New York. A 2-page blue print spread shows typical settings of this stoker as applied to different types of boilers and numer-

ous installations are illustrated. Air control, drive and furnace arrangement are discussed at some length.

Steam Turbines

899 . . . General data on steam turbines for the mechanical drive of pumps, fans, compressors, blowers, pulverizers, etc. are given in Publication GEA-1145C issued by General Electric Company, Schenectady, N. Y.

United States Gypsum Products

Three new catalogs have been issued by United States Gypsum Co., Chicago:

900 . . . Color Mixing Guide, explaining how to mix shades and tints of Texolite Deep Colors and Texolite Paints. A handy reference guide to the selection of color combinations is included, together with swatches of the colors and their reproductions in natural reproduction.

901 . . . Perforated Rocklath, a plaster base, is illustrated and described in a four-page filing-sized catalog.

902 . . . The advantages and application methods of Weatherwood Reinforced Insulating Lath are described in a four-page booklet.

Electric Control Valves

903 . . . Frick Company, Waynesboro, Pa., has published a 12-page, filing-sized booklet (Bulletin No. 203-C) on electric control valves for refrigerating plants. Each type in the line is described and illustrated, together with tables giving sizes, application data, etc. Wiring and piping diagrams for various types of installations are included.

Air Diffusers

904 . . . Knowles Mushroom Air Diffusers for the intake or exhaust of air in auditoriums are illustrated and described in an 8-page catalog issued by Knowles Mushroom Ventilator Co., New York. Methods of installation and specification data are included. Filing size; A. I. A. File 30-D.

English Woodwork

905 . . . The characteristics of English and Norman French home architecture and woodwork are described in a reprint of the 28-page catalog issued by Morgan Woodwork Organization, Chicago. Details illustrated include entrance frames, casement sash, stairways, interior trim, doors, mantels, cabinets, etc. Filing size; A. I. A. File 19-E.

Fuel Saver

906 . . . Harvey-Whipple, Inc., Springfield, Mass., has issued a four-page, filing-sized catalog which describes the advantages and features of the Master Kraft Fuel Saver, a device designed to secure maximum heating surface and unimpeded circulation. A diagram is included which shows the schematic piping of this device.

Ventilation

907 . . . A talk given before The Boston Air Conditioning Bureau by Mr. P. D. Briggs, vice president of The Ilg Electric Ventilating Company, Chicago, on the subject of "Sensible Ventilation," has been reprinted by this company and made available to those interested.

Night Sports Lighting

908 . . . Crouse-Hinds Company, Syracuse, New York, has issued a 52-page catalog (Bulletin 2299) illustrating and describing its various types of floodlighting equipment for night sports lighting. Each chapter is devoted to a specific type of night sports and gives data on installation, amount of light needed, type of equipment and a lighting layout.

Oil Boilers and Furnaces

The Timken Silent Automatic Co., Detroit, has available two new catalogs:

909 . . . The advantages, design and construction features of Timken Silent Automatic Air Conditioning Oilfurnaces are described in an 8-page illustrated catalog (AD314).

910 . . . The features of the Timken Series GC Oilboiler are fully explained in a new six-page broadside (AD342). A table of mechanical data is included.

Wall Coping

911 . . . A 4-page catalog issued by The Robinson Clay Products Co., Akron, O., briefly describes and illustrates Robinson Salt Glazed Vitrified Clay Lap-Lok Wall Coping. Filing size; A. I. A. File 5-K.

Air Filters

912 . . . A revised edition of its catalog (Form 114-A) on Multi-V-Type Air Filters has been issued by Staynew Filter Corp., Rochester, N. Y. Design features, application data and specifications are given. Filing size; A. I. A. File 30-D-3.

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NEW YORK, N. Y.

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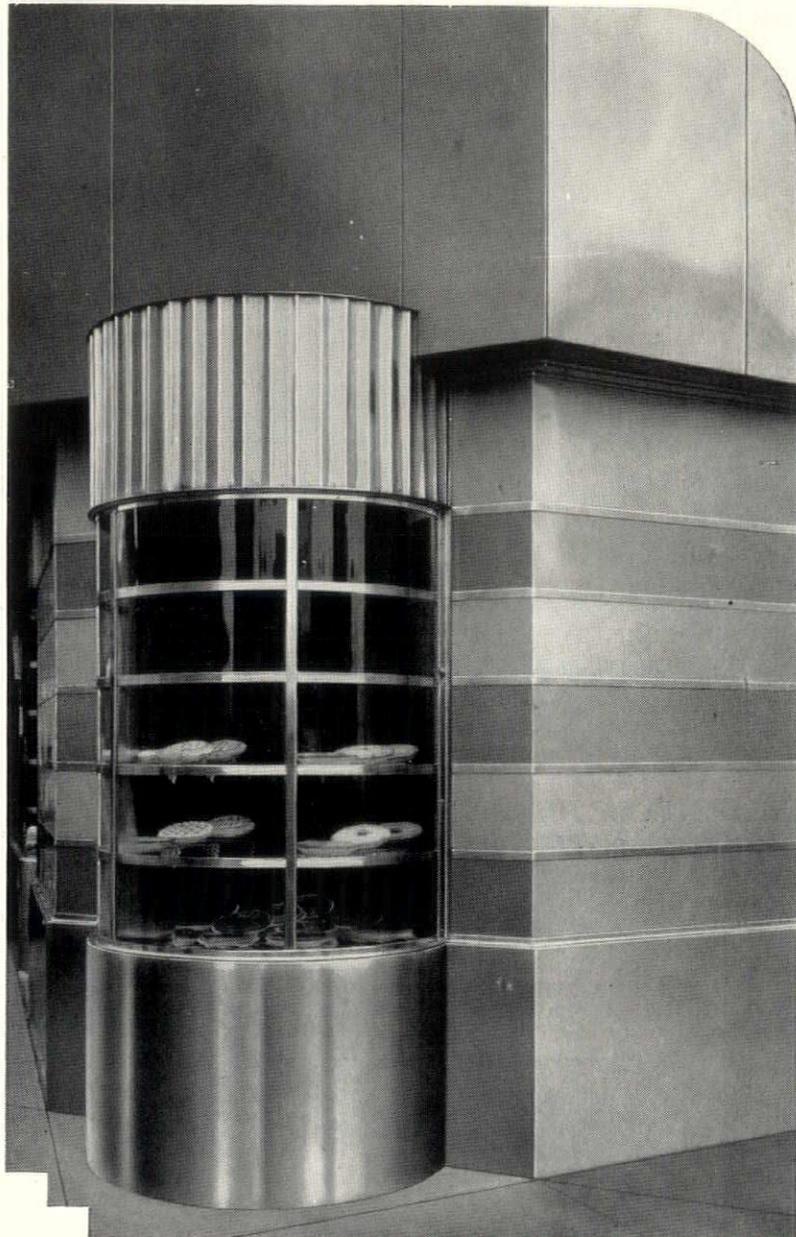
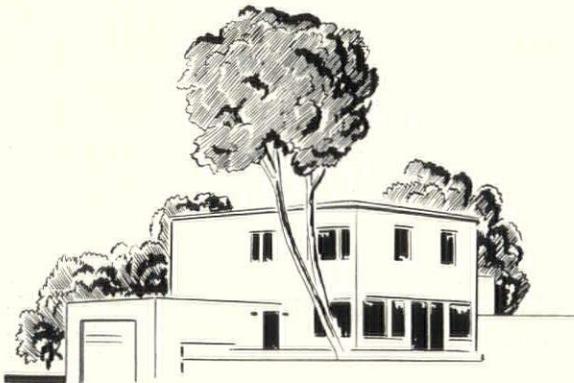
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572 Madison Avenue

New York, N. Y.

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There's money
**IN REMODELING
 STORE FRONTS
 ... OR HOMES**



THIS modernization movement has proved a profitable one to the architect, the engineer and the builder. But it has thrown an increasing demand upon these gentlemen for a working knowledge of the various steels that might be used.

As the largest manufacturers of sheet metals, we have actively kept pace with new and improved methods of forming and fabrication. We are able to supply high grade sheets for every known purpose in modern building construction, not only in such familiar applications as roofing, siding, gut-

ters, sky-lights, cornices, but also for corner bead, metal lath, moulding, doors, window frames, air conditioning and ventilating ducts.

AMERICAN products are sold by leading metal merchants. Write for full information on Black and Galvanized Sheets, Formed Roofing and Siding Products, Sheets for Special Purposes, Cold Rolled Sheets, Enameling Sheets, Electrical Sheets, Tin and Terne Plates — also USS High Tensile Steel Sheets, and USS Stainless Steel Sheets and Light Plates.



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United States Steel Corporation Subsidiaries

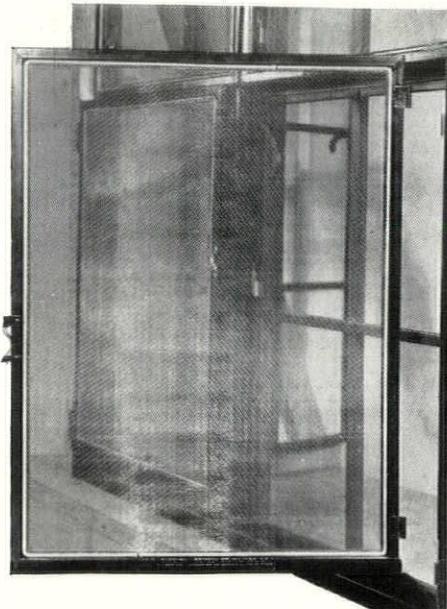
UNITED STATES STEEL

STRUCTURE



REINFORCING LATH

For suspended ceilings, tie-on partitions, and all other types of tie-on work, the Reynolds Corporation, New York, has developed a new type of reinforcing lath, called Reynolds Slotted Ecod Fabric. The new lath is slotted at regular intervals to permit tying on to ceilings under steel joists. The new material is said to be an effective saver of time and materials and to provide a smooth surface finish. Large sheets of the fabric, 8' x 1½" x 31" are used, which is sufficiently rigid for one workman to handle and yet not so large as to require two men for its installation. 565M



METAL CASEMENT SCREEN

A new casement screen, complete with a light frame of its own, which attaches directly to the casement frame by means of a patented clip, is particularly suited for use in large apartments, hospitals, offices and public buildings. The screen

is hung on pin hinges to its own frame. The latter remains attached to the casement and need not be removed to detach the screen. The clip by which the screen frame is attached to the casement is made of spring steel and when once in place makes a permanent attachment. The method of pivoting the clip is an important patented feature of the new screen. Screen and frame are made of rolled steel and can be obtained in a variety of finishes to harmonize with interiors. No tools are required for installation. The Marvel Casement Screen Co., Brooklyn, N. Y., is the manufacturer of this new unit. 566M

FINISHING MATERIAL

PROTECTIVE COATINGS

Technical Coatings, Inc., New York, is producing a line of new coatings said to be free from porosity and impervious to water and corrosive atmospheric gasses. The vehicle of these coatings is described as a combination of pure vegetable gums and heat-treated oils. It contains no linseed oil or synthetic resins. It forms films which are claimed to be air-tight and water-tight; which are elastic and which produce hard films that will not peel, chip nor crack. The coatings are used for preventing corrosion of metals as well as for wood and other surfaces such as dry concrete and plaster. Primers with the new non-porous base are available as well as finishing coats in standard colors. Application is by brush, spray or dipping. 567M

INSULATION

FIBROUS GLASS

Fibrous glass is now being produced in three different forms: (1) Glass wool, a fluffy, almost snow-white mass used as insulation for homes. It emerges from furnaces on a conveyor, a continuous line of material about 1 yd. wide and 4 in. deep. It is cut into packs which later are placed between walls and on floors in attics of new homes. For homes already built the wool packs are reduced to pellets which are forced between walls by a blower machine. (2) Glass air filters; the fibres, each about the size of a broom straw, are assembled into mats about two inches thick and sprayed with an odorless, non-evaporating chemical adhesive. Properly encased, they are installed in warm air furnaces and ventilating systems generally. (3) Glass thread and yarn; ordinary

glass is drawn into a fibre 20 times less in diameter than human hair. Fibrous glass is the result of a process developed by Industrial Materials Division, Owens-Illinois Glass Co., Toledo, Ohio. 568M

HEATING



GAS UNIT HEATER

The Floorflo Heater, a new heating unit for factory and industrial heating, is furnished in either floor or suspended type, and uses gas as the heating medium. Its makers claim for the unit that with it 85% heating efficiency may be obtained. It is so compact that it may be installed in rooms where space is at a premium. The unit may be automatically controlled and has the latest safety devices. Because of the Freeflo Grille with which it is equipped, heat is delivered into the cold air strata at the floor line. The grille also completely hides the interior of the unit. The Trane Company, La Crosse, Wis., in conjunction with The People Gas Light & Coke Co., Chicago, has introduced the Floorflo Heater. 569M

SEAMLESS ALLOY TUBES

Seamless tubes and pipes of a highly alloyed steel containing 25% chromium and 20% nickel have recently been developed. They are available hot-finished in sizes up to 6 inches outside diameter and cold-drawn in smaller sizes. The new alloy, known as B & W Croloy 25-20, is said to have a high degree of oxidation resistance and to be suitable for continuous operation at temperatures up to approximately 2100 F. The new tubes find application in high temperature refinery operations as
(Continued on page 104)

AFTER 7 YEARS OF CONSTANT SERVICE

in Washington Tower Apartments

ELECTROLUX

"still giving the same efficient, low-cost performance they did when I bought them."

—writes I. WOHL, of 31-17 Thirtieth Avenue, Long Island City

WILL the refrigerator you install in 1936 still be serving you faithfully in 1943? There's one way of making sure of this long, dependable service! Do as leading builders and operators have been doing . . . install *Electrolux!*

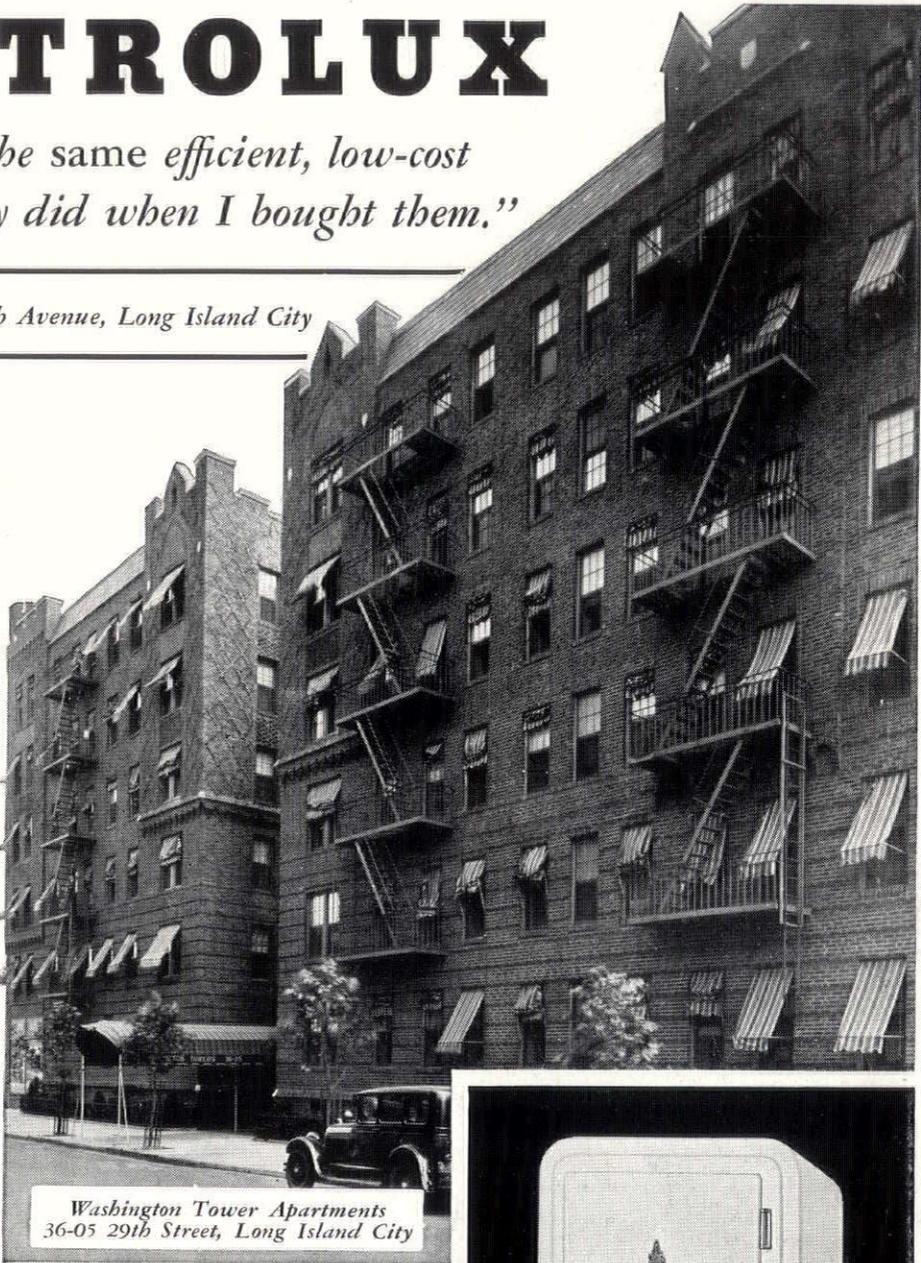
This letter from Mr. I. Wohl, New York builder, to his gas company offers a typical example of the lasting efficiency of this modern gas refrigerator.

"I am delighted to learn how popular the new G-410 Electrolux is proving. I am always interested in hearing about new Electrolux models because you know how enthusiastic I am about this gas refrigerator. As you may remember, I purchased my first Electrolux in 1929. I chose it over all other makes because I felt that a refrigerator which had no moving parts to wear, and which was serviced by my own gas company assured the most in long economical service.

Nine Hundred Electrolux Installed

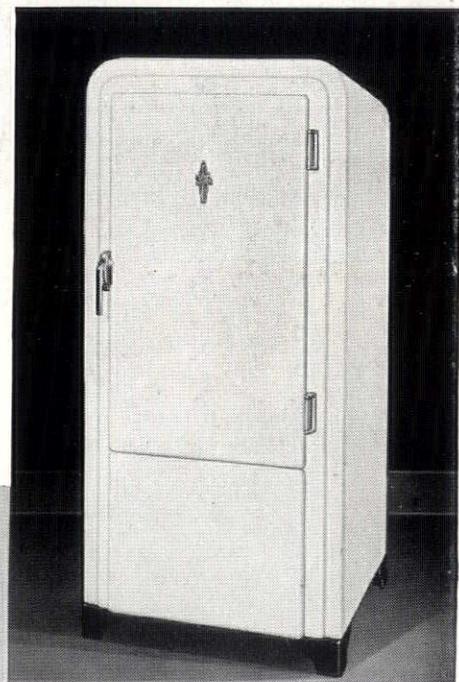
"Today, I have approximately nine hundred Electrolux installed in my various properties. And even our first *Electrolux Refrigerators installed seven years ago in our Washington Towers Apartments are still giving the same efficient, low cost performance they did when I bought them.*"

If you are planning the purchase of automatic refrigerators—as new equip-



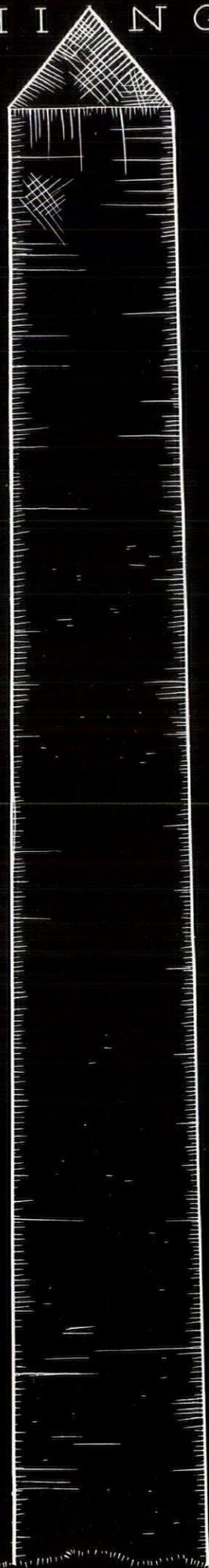
*Washington Tower Apartments
36-05 29th Street, Long Island City*

ment, or to replace old refrigerators—it will pay you to investigate Electrolux. Get in touch with your gas company. See the new 1936 models on display at their showroom! Servel, Inc., Electrolux Refrigerator Sales Division, Evansville, Ind.



New Air-Cooled **ELECTROLUX**
THE SERVEL *Gas Refrigerator*

THE WASHINGTON MONUMENT



C O N C E R N I N G P E R M A N E N C E

Nothing completely eludes the stalking steps of time. ¶Permanence is relative. We moderns are too familiar with the inexorable march of obsolescence to approach all design, all construction, with the blithe expectation that it will stand forever. ¶What measure then shall we use when we speak of permanence? How long is permanent? ¶Aluminum is a young metal, as metals go, obviously unable to marshal the experience of centuries out of a comparative youth of only fifty years of commercial availability. ¶The expectation of long life for architectural details of Alcoa Aluminum is just plain common sense, based on good chemistry, and substantiated by laboratory test. Moreover, every year accumulates the proof of experience. ¶For instance, before there was any commercial Aluminum, a 100-ounce cap, cast from Aluminum that did not have the benefit of modern technical control, was set on the tip of the Washington Monument. That was in 1884. ¶Fifty years later, in 1934, the cap was examined by a group of scientists, and was found to be so little affected by a half-century of exposure that shallow engraving on its faces was perfectly legible. ¶The cap is still in place, a symbol of permanence.

Aluminum Company of America, 2195 Gulf Bldg., Pittsburgh, Pa.

ALUMINUM

ALCOA



TECHNIQUES

METHODS • MATERIALS • RESEARCH • PRACTICES

well as high temperature equipment. They are being produced by the Babcock & Wilcox Tube Co., Beaver Falls, Pa. 570M



ELECTRIC COOKING RANGE

A new electric range, named the "G-E Speedster," has been introduced by General Electric Co., Nela Park, Cleveland. It features a "Tripl-Oven," consisting of a "Super-Speed" pastry oven which is said to give as much as 25 to 30 per cent greater baking speeds, a "Super-Fast" broiler, and a roasting oven with 5 per cent greater capacity than the standard 16-inch oven. Other features include sliding oven shelves with safety stop at rear; Hi-speed Calrod surface units; smooth-top, 6-quart cooker; automatic temperature control with pilot light; new type storage compartment; appliance outlet; modern table-top styling; white all-porcelain finish with black and chrome trim. The range occupies a floor space of 36 x 23 inches and an overall weight of 40½ inches. 571M

GARAGE HEATER

What is said to be an entirely new principle in heating large areas such as public garages is found in the new combined electric and steam directional heater recently introduced. The heat for this unit is supplied from existing steam lines. When properly located it is claimed to supply heat where it is most needed by delivering a high velocity conical column of air downward in such manner that it strikes the floor and rolls along in every direction. A fan driven by a small motor draws a large volume of air through the copper coil and gives it this high velocity downward direction and penetration. The compactness of the unit allows all pipe lines to be carried close to the ceiling. It can also be conveniently ad-

justed to the job it is to do. This new unit, known as Type G Heater, is manufactured by L. J. Wing Mfg. Co., New York. 572M

GAS RANGES

A complete line of gas ranges has been introduced by Norge Division, Borg-Warner Corp., Detroit. Basically the line consists of five models, each incorporating the latest advances in gas ranges. The Concentrator burner, developed by Norge range engineers, is standard equipment in these units. Sixty ports open on the inside of a circular burner, below the top surface, protected by a high burner tray, providing a blue cone flame of intense heat. The flame is directed inward to the center, across the bottom of the cooking vessel. Heat flow is even with no hot spots. The new ranges can also be had in combination with Rollator refrigerator Models P-621 and P-720 in matched color and design. 573M

PLUMBING

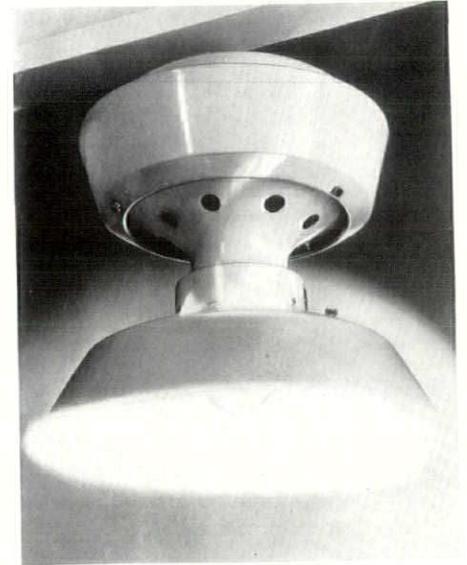


LAUNDRY TUBS

Several new features have been incorporated in the construction and styling of a recently introduced line of basement laundry tubs. The tubs, which are mounted on individual bases with adjustable legs, can be used singly, in pairs or in series. When they are fastened together, the fastening bracket serves as a soap dish. Height of the tubs can be adjusted to a range of 32½ to 35½ inches above the floor. The interior of the tub is finished in white porcelain while the outside is finished in acid-resisting porcelain with a variety of colors in combination optional. The tubs, base and legs all are made of formed metal. The units can also be used as utility or service tubs for restaurants, hospitals and other places where sanitation is vital. The plumb-

ing ware division of Briggs Manufacturing Co., Detroit, is marketing these new units. 574M

ELECTRICAL



INDUSTRIAL LIGHTING UNIT

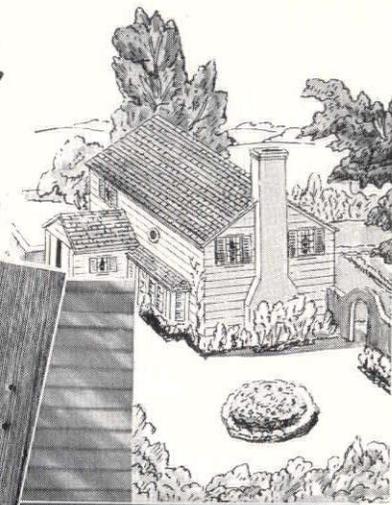
A self-contained industrial lighting unit with color characteristics said to approach actual daylight more closely than heretofore, has been placed on the market. Known as the "circular mercury-incandescent" the light consists of a unit in which a circular mercury-vapor tube and an incandescent lamp are combined beneath one reflector to provide the desired spectral balance. The unit itself contains the auxiliary for operating the mercury-vapor tube and is installed and connected to the line in the same manner as the ordinary unit for incandescent light. It is recommended for industrial lighting applications involving accurate color differentiation, critical inspection or other operations which involve difficult visual problems. The new light is a product of General Electric Vapor Lamp Co., Hoboken, N. J. 575M

OUTDOOR LIGHTING CONTROL

Among a number of new features, independent "on" and "off" adjustments represent the most important improvement in the new Novalux photoelectric relay for control of outdoor lighting. This relay can be adjusted to turn on or off at any daylight intensity within its working range, each adjustment being separate from and independent of the other. In this manner, the relay can be set to switch off at a lower intensity in the morning than that at which it turns on in the evening. The

(Continued on page 106)

... a perfect exterior
for Model Homes ...



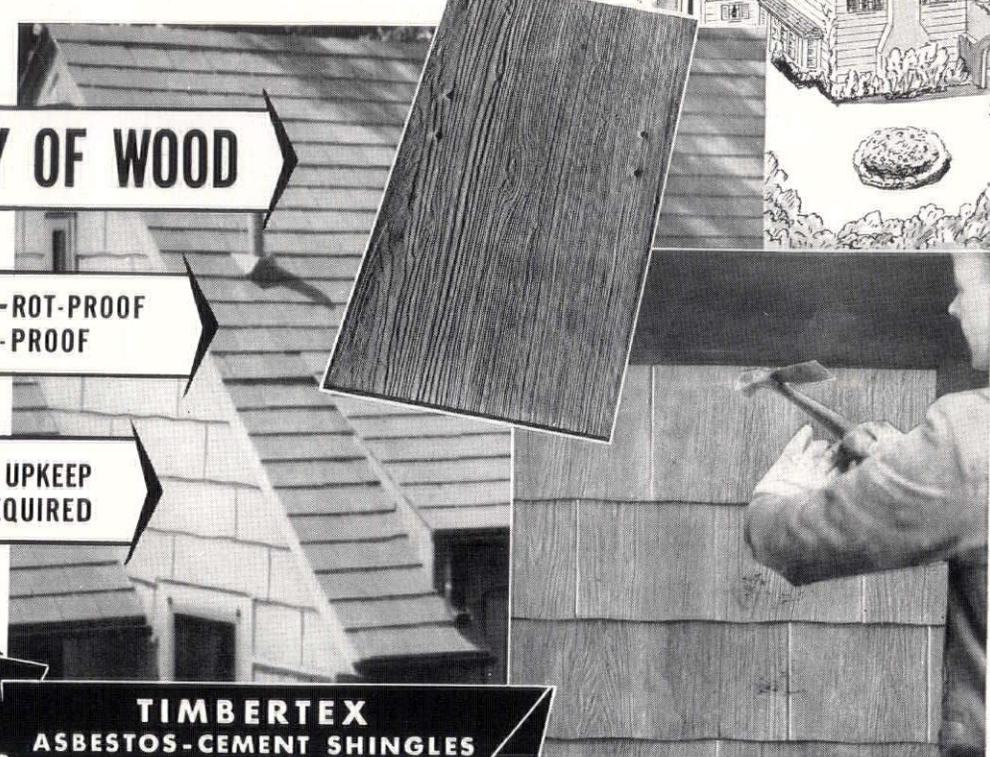
ALL THE BEAUTY OF WOOD

PLUS...

SAFETY FIRE-PROOF—ROT-PROOF
TERMITE-PROOF

AND

ECONOMY NO PAINT OR UPKEEP
EXPENSE REQUIRED



**TIMBERTEX
ASBESTOS-CEMENT SHINGLES**

**TIMBERTEX
ASBESTOS-CEMENT SIDINGS**

RUBEROID presents exteriors for model homes that architects and builders have long awaited. Charming cypress-textured asbestos-cement shingles for roofs and sidewalls have been developed, that are long-lived, fire-proof, rot-proof and termite-defying. No stain or paint is required to prolong their life. Their trade name is Eternit Timbertex.

Both Timbertex roofing and siding shingles faithfully reproduce the choicest designs of wood graining in popular "wood" colors. The color pigments are built in—an integral part of the material.

Eternit Timbertex Shingles are made 8x16 inches, tapered for the American method of application, or in the 16x16 inch size for Dutch Lap

RU-BER-OID ARCHITECTURAL PRODUCTS
BUILT-UP ROOFS
ASBESTOS SHINGLES
ASBESTOS SIDINGS
ASPHALT SHINGLES
MINERAL WOOL INSULATION
ASBESTOS PIPE COVERINGS
WATERPROOF SHEATHINGS
NEWTILE
NEWMARBLE

effect. Timbertex Siding Shingles are offered in Colonial and Thatched designs, 12x24 inches in size. Nail holes are pre-punched for quick and accurate application.

Builders the nation over are most enthusiastic about the many value-giving features of Eternit Timbertex Roofing and Siding Shingles. They marvel at their surprisingly low first cost, which is still further reduced by the yearly savings they assure in up-keep expense.

Investigate—Also check on the coupon other RU-BER-OID Roofing and Building Products which are of interest to you.

RU-BER-OID
ROOFING AND BUILDING PRODUCTS

The RUBEROID Co., 500 Fifth Avenue, New York, N. Y.

AA 2-36

Please send specification data covering the Ruberoid Products checked.

Timbertex Shingles Newtile Wall Panels Asphalt Shingles Built-up Roofs Timbertex Sidings
Mineral Wool Insulation Asbestos Pipe Coverings Newmarble Wall Panels Waterproof Sheathings

Name _____

Address _____

TECHNIQUES

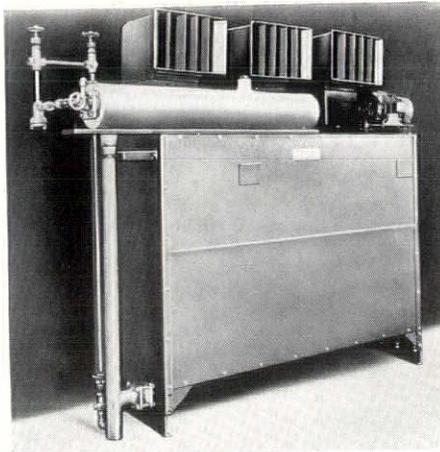
METHODS • MATERIALS • RESEARCH • PRACTICES

independent adjustment of the relay is accomplished by means of two potentiometers and a time switch. General Electric Company, Schenectady, N. Y., manufactures this unit. 576M

MASTER ANTENNA

A master antenna system which is equally effective for short-wave and broadcast reception and which will operate as many as twenty-five receiving sets has been developed. The system comprises an antenna unit connecting doublet antenna with downlead transmission line, which in turn connects with individual set coupler for each set to be operated on system. The transmission line consists of a twisted-pair rubber-covered cable with a neutral buff covering. It can be strung along the outside wall, or through conduit in new buildings. Each set coupler is located with reference to a radio set. In concealed wiring the coupler fits within a standard outlet box with a polarized plug face plate. In exposed wiring the coupler is encased in a base with black bakelite top carrying terminal screws connecting with antenna and ground terminals of set. The system is available through Technical Appliance Corp., New York. 577M

AIR CONDITIONING



INDUSTRIAL AIR CONDITIONING UNIT

A new line of industrial air conditioning units, designed to meet a wide range of industrial air-cooling requirements, has been announced by York Ice Machinery Corp., York, Pa. The new models can be installed with or without ducts. Furnished in either the high or low pressure type, the York automatic float control is said to permit accurate and automatic control of the refrigerant.

whether ammonia, circulating brine or cold water is used. Where circulating brine or cold water is used as a refrigerant, special coils and headers are furnished. Each unit is enclosed in heavy steel casing, fully braced. Fans are of the quiet operating multi-blade, double inlet type. 578M

ZONOLITE AIR DUCTS AND INSULATION

The development of a new type of air duct made of wire mesh of a special weave, to which is applied Zonolite Air-Duct Insulation, is said to make possible the use of small ducts with quiet operation at higher velocities. Zonolite insulation is usually applied in two coats and makes a solid covering over the duct. It is a micaceous, non-ferrous, granular material and has both a cellular structure, which resists heat radiation, and bright reflecting surfaces, which check radiation. It is also claimed to be an efficient sound absorber and insulator. The duct has no sound-absorbing liner of any kind as the Zonolite cover absorbs the noise through the mesh openings. This is a new development of the Zonolite Corporation, Detroit. 579M

ANOTHER *Koh-i-noor* PRODUCT

DESCRIBED BY A. L. GUPTILL

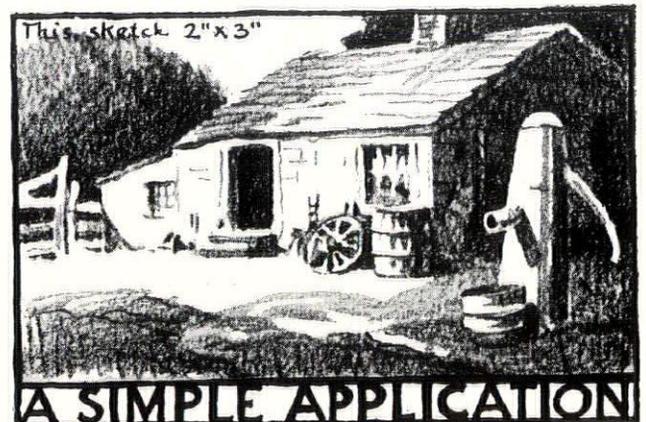


THE
FAMOUS
NEGRO

NEGRO PENCIL IS BLACK!

YES SIR! Whether one uses Pencil No. 350 (which comes in Degrees 1, 2, 3, 4, 5 at 10¢), or Lead No. 2610 (for adjustable holder) at 5¢, he has the lead the professional artist prefers. It is smooth and "juicy" • It erases well • It takes water color or wash • It reproduces particularly well • Ideal for quick sketching, giving off its tone freely, yet producing results which do not smooch badly • Much used by newspaper artists and book and magazine illustrators •

TO TRY IT ONCE IS TO LIKE IT!



KOH-I-NOOR PENCIL CO., INC.

• 373 FOURTH AVE. • NEW YORK • N. Y. •

50 YEARS in the steel heating-boiler business

1886



Power Heating
THE FITZGIBBONS
BOILER

Fitzgibbons Boiler Company, Inc.

570 SEVENTH AVE., NEW YORK
(AT SIX STREET)
TELEPHONE: BRYANT 9-3150

1936

TO ALL FRIENDS OF
BETTER STEEL BOILER HEAT

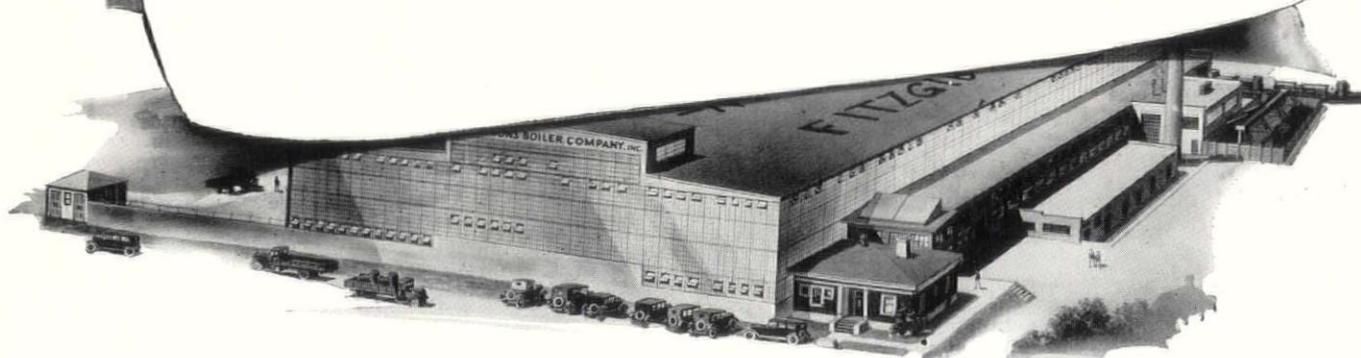
Fifty consecutive years devoted solely to the development and manufacture of a steel boiler carries a distinct obligation. That obligation is, to pledge ourselves whole-heartedly to the close adherence to those principles of boiler-making which have been responsible for our half century of success, and which our many friends in the heating industry have come to expect in our product.

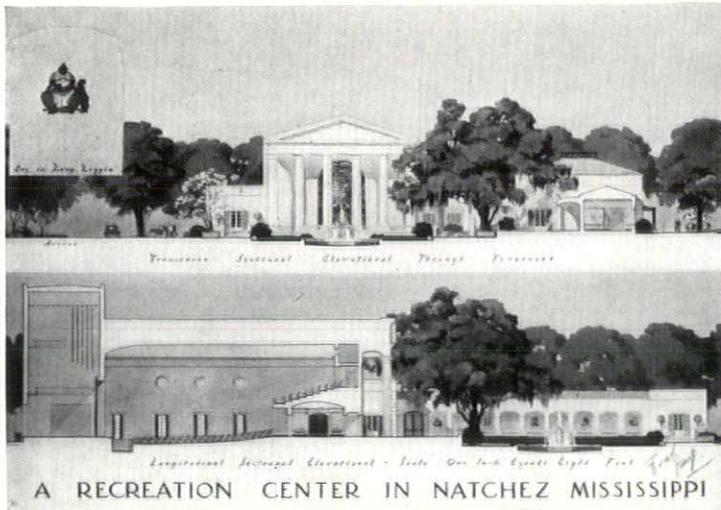
We approach our second half century with confidence. We know what the heating industry demands of our product. We know how to build that product to meet those demands - how to build steel boilers for every heating need, every required capacity, to operate at the utmost economy with any type of fuel, in any heating system.

We pledge ourselves to the study and adoption of every modern production facility calculated to improve the quality of Fitzgibbons Boilers. With this sincere statement of our aims, we present Fitzgibbons Steel Boilers for 1936.

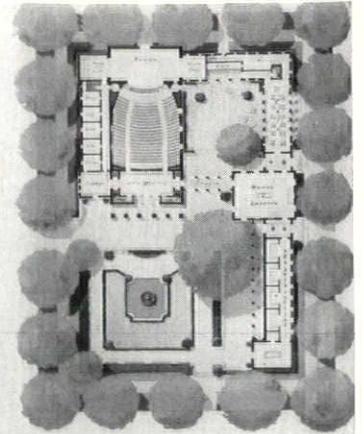
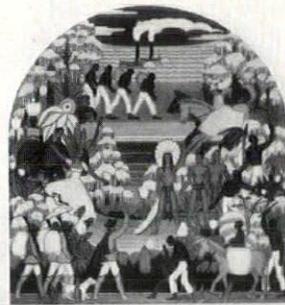
Very truly yours, 1886 / 1936
FITZGIBBONS BOILER COMPANY, INC.

Harro Adams
President





A RECREATION CENTER IN NATCHEZ MISSISSIPPI



Scale - One Inch Equals Sixteen Feet

A RECREATION CENTER IN NATCHEZ MISSISSIPPI

First prize design in the recent competition sponsored by the Alumni Association of the American Academy in Rome, which was won by four students at Cornell University

AMERICAN ACADEMY COMPETITION

Four students of the Cornell College of Architecture have been awarded first prize of \$300 in the competition sponsored by the Alumni Association of the American Academy in Rome for plans for a community recreation center for a town of 12,000 people. The winning plan was submitted by B. J. Rabe, Arthur Briggs, J. C. Lawrence, and R. S. Kitchen. Second prize of \$150 went to students of the Pennsyl-

vania Academy of Fine Arts, and third prize of \$75 to a team from the Yale School of Fine Arts. William A. Delano, Edward J. Williams, architects; Sidney Waugh and Joseph Kiselewski, sculptors; Michael Rapuano, landscape architect; Barry Faulkner and Francis Bradford, painters, acted as judges.

ANDERSON GOLD MEDAL AWARD

Dr. Arthur Cutts Willard, President of the University of Illinois, has been

awarded the F. Paul Anderson Gold Medal of the American Society of Heating and Ventilating Engineers. John Howatt, president of the Society, made the presentation at the 42nd annual meeting held in the Palmer House, Chicago, January 29, 1936. The Committee on award honored Dr. Willard because of his outstanding service as a consultant on the ventilation of the Holland tunnel, the United States Capitol, and the proposed Chicago subway.

Air Conditioned with Frick Refrigeration



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- 6 Separate sheets are available at 10 cents each.

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NOTE: Due to the unexpectedly large demand for these sheets our original stock has been exhausted. Pending a reprint now on the presses, there will be a slight delay in supplying sheets to recent applicants.

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NEW OFFICES

Clark & Crowe, architects, have dissolved partnership. The principals will continue their practice under their individual names as follows: Pendleton S. Clark, 610 Krise Building, Lynchburg, Va. Walter Rogers Crowe, 609 Krise Building, Lynchburg.

Robert H. Smith & Associates, architects and engineers, have recently opened an office at 5920 West North Avenue, Milwaukee, Wisconsin.

The Central Foundry Company announces the removal of its Pacific Coast sales office from San Francisco to 278 Fourth Street, Oakland, California. Messrs. John Ponsaing, E. A. Keithley, and K. P. Hughes will make their headquarters at the new office.

Sidney H. Kitzler, architect, announces the removal of his office to 52 Willoughby Street, Brooklyn, New York.

John P. Baker, architect, has moved his office from 756 Bristol Avenue, to 702 Building and Loan Building, Grand Rapids, Michigan.

Charles W. E. Clarke, consulting engineer, has opened an office at 12 South 12th Street, Philadelphia.

John W. Ahern has received temporary leave from his duties as mortgage officer of the Teachers Insurance and Annuity Association to serve as an assistant administrator for FHA in Washington. Meanwhile, William D. Flanders, Deputy FHA Administrator, formerly in charge of Title I of the National Housing Act, changed jobs to take charge of Titles II and III.

Bowden & Russell, architects, have dissolved their partnership. Phillips Russell will continue practice with offices at 420 Madison Avenue, New York.

Paul J. Saunders announces the opening of offices for the general practice of architecture and engineering at 413 Murphy Building, East St. Louis, Illinois.

Leslie I. Nichols, architect, and G. Willard Somers have moved their offices from 529 Guinda Street to 532 Emerson Street, Palo Alto, California.

ERRATA

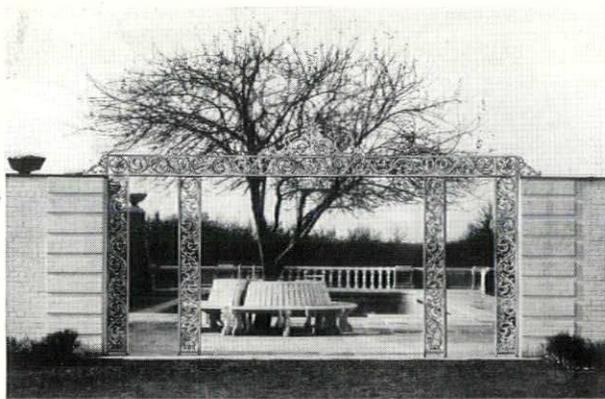
In our December, 1935, issue we published a number of illustrations featuring "The Restoration of Williamsburg, Virginia." We regret that Mr. Arthur A. Shurcliff, of Boston, was not given proper credit as the landscape architect in charge of this work.

OBITUARIES

Harry E. Weeks, 64, of the architectural firm of Walker & Weeks, architects for many of Cleveland's most imposing buildings, died recently after having been in ill health for the last two years. The death of Mr. Weeks ended 40 years of professional association with the senior partner in the firm, F. R. Walker. They were the architects on the Indianapolis World War Memorial, Cleveland Federal Reserve Building, Severance Hall, and the main building of the Public Library. Mr. Weeks was born in West Springfield, Mass., and was educated at the Massachusetts Institute of Technology. He was a member of the American Institute of Architects, and of the Cleveland Engineering Society.

Frederick Staples Benedict, a partner in the firm of York & Sawyer, New York, for more than thirty years, died recently at the age of 75. A graduate of the Cornell University School of Architecture in 1885, he worked for Babb, Cook & Willard before joining York & Sawyer. Among the buildings which were constructed during his connection with the firm of York & Sawyer were the New York Athletic Club, the Brooklyn Trust Company, and the First Bank and Trust Company of Utica, New York.

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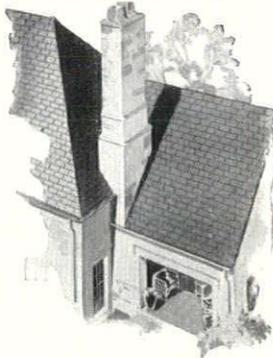
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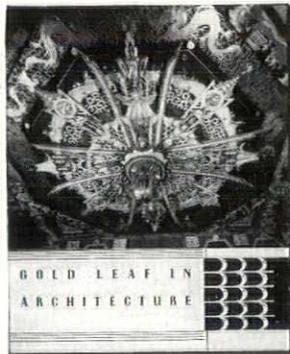
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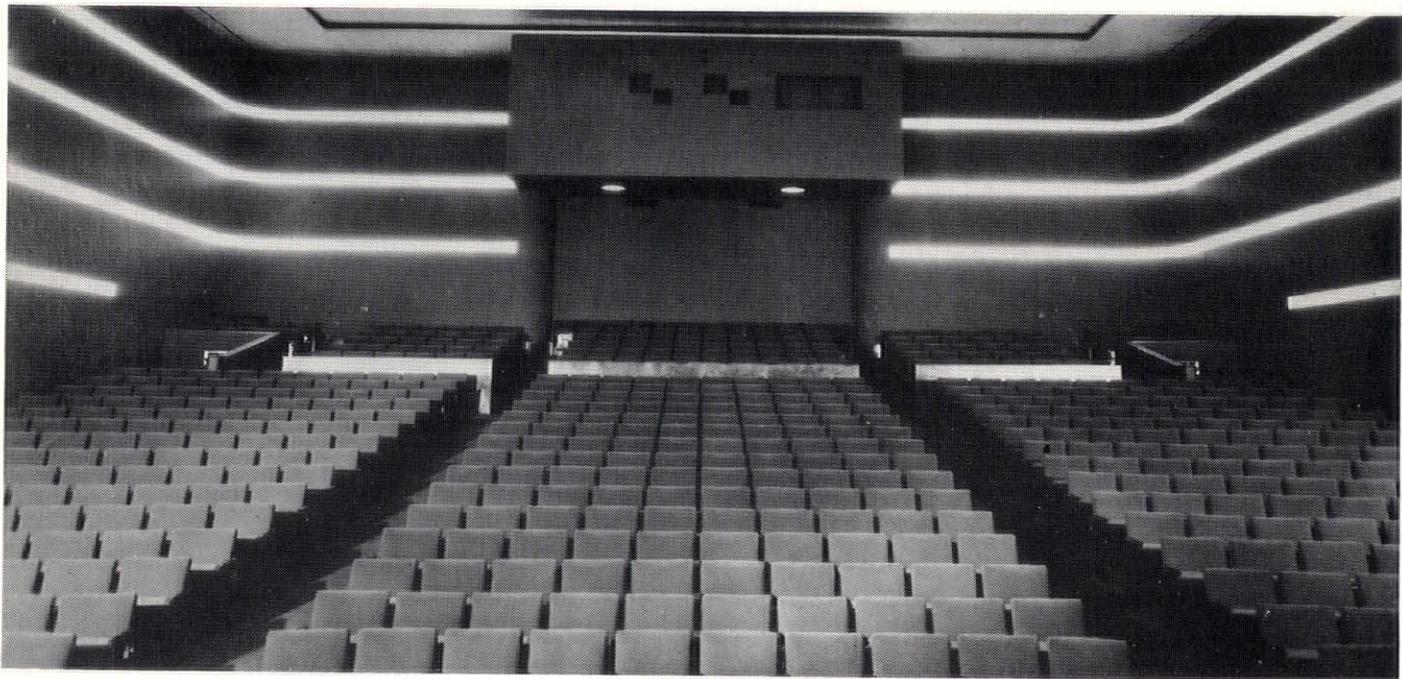
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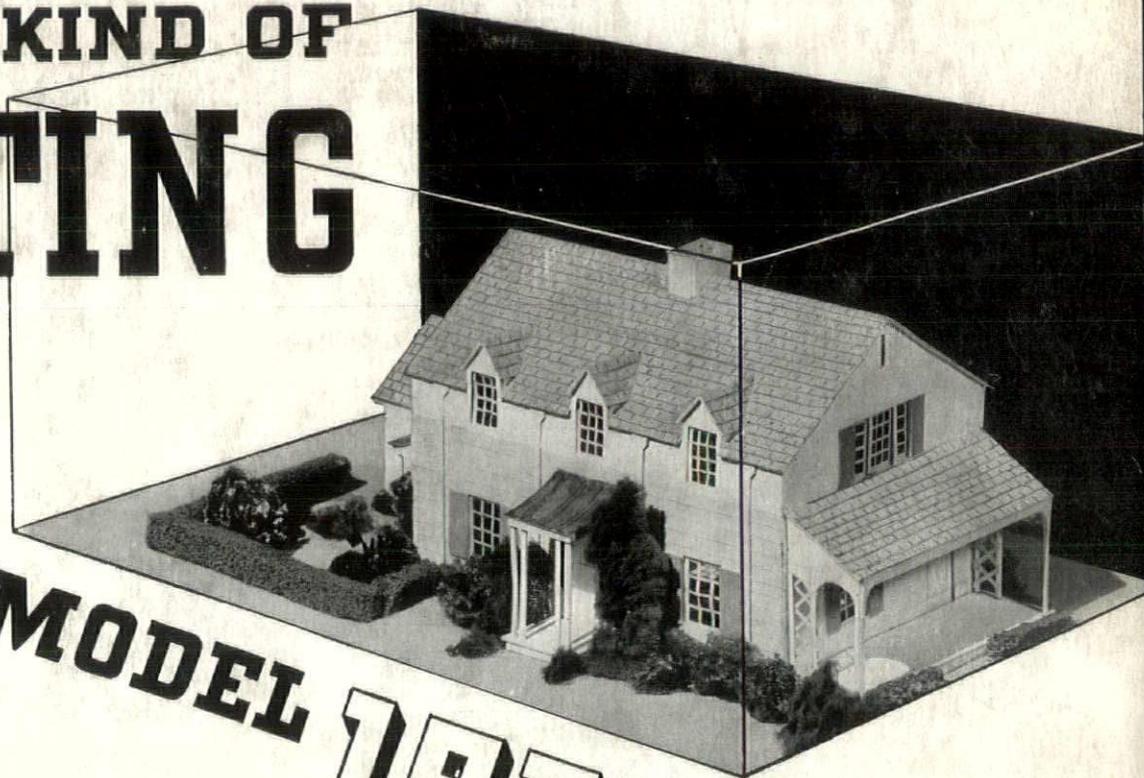


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