

June 1952

house + home

edition

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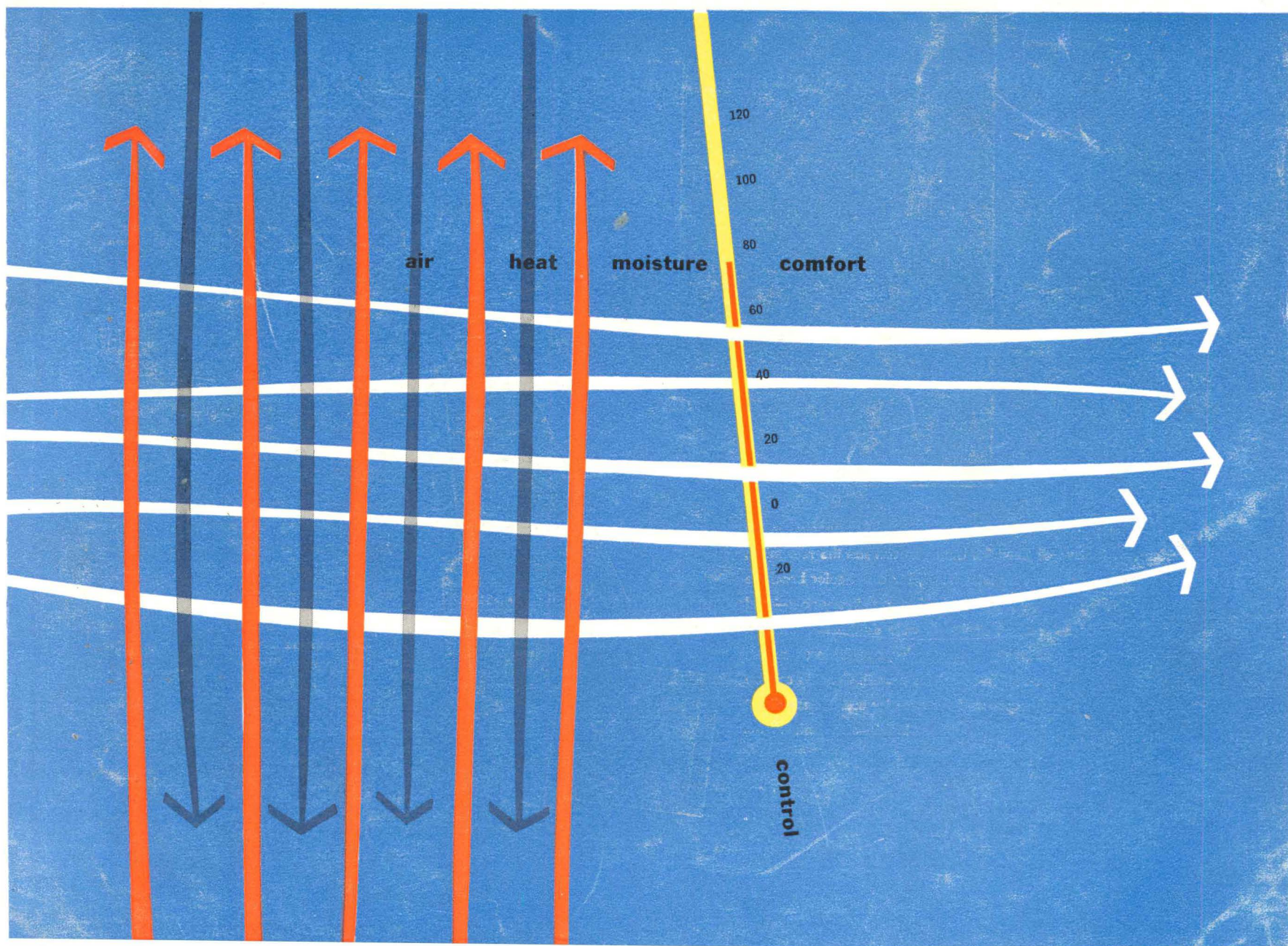
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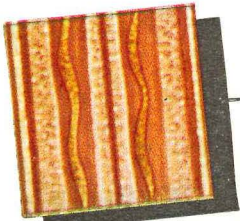
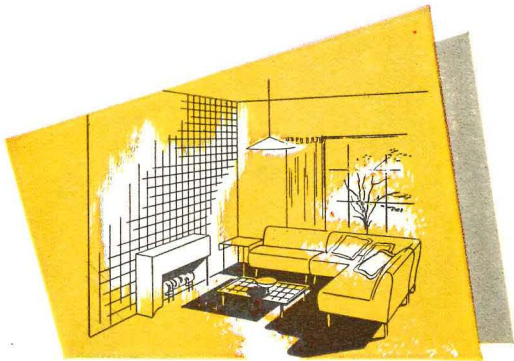


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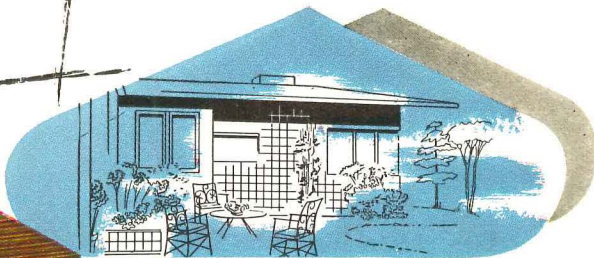
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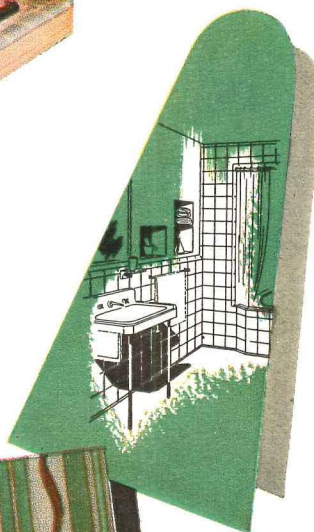
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Los Angeles Casts Big Vote Against Public Housing; Repercussions Seen in Congress

In Los Angeles, public housing suffered its worst defeat at the polls since the 1949 Housing Act was passed. After one of the hottest campaigns on the issue yet waged in a US city, Los Angeles voters on June 3 disapproved a \$110 million federally subsidized program 378,343 to 258,718. Even some leading opponents of public housing were surprised at the margin. Said builder Fritz Burns: "I wouldn't have bet on more than 51% of the vote for our side." Actual result: 59.4% against public housing; 40.6% for.

Effect: doubtful. The outcome left the fate of the 10,000 unit program up in the air. Last December, the L. A. City Council resolved, 8-7, to break its 1949 contract with the city housing authority. Public housers fought the case to the California Supreme Court, which ruled the city must carry out its contract. With the returns in, realtors and builders proclaimed the city was bound by a people's mandate to halt the program despite the Public Housing Administration's warning it will then sue the city for \$13 million federal funds already spent.

Upset in Akron. Elsewhere, spring balloting was bringing in still sharper defeats for public housing. Akron, Ohio (pop. 275,000) is a strong union town. CIO rubber workers claim 35,000 Akron members. Other CIO and AFL unions—whose spokesmen unanimously plug public housing projects—claim another 35,000. Akron is also a city of 69% home ownership. At the May 6 primary, voters said no to construction of 400 more public housing units by a margin of 43,620 to 21,201. Theme of the battle against public housing: "There is no free lunch." Commented builder Clinton R. Miller, a former president of Akron's real estate board who took a leading part in the campaign: "If it happens here it must indicate a trend."

Other returns. There was some evidence that Miller was right in claiming voter opposition to public housing was becoming a trend. Other returns last month:

- ▶ Columbia, Mo. voted 2,669 to 1,107 against creation of a local housing authority.
- ▶ Cleburne, Tex. defeated a housing project 1,112 to 635.
- ▶ Decatur, Ill. rejected public housing by a two-to-one margin.

Since the '49 Housing Act set up an eight-year program of 835,000 public housing units, 50 communities had voted on the issue. So far, public housing had won 11 elections (mostly in small towns), lost 39 (including Seattle, Portland, Houston and Milwaukee).

Associated Press



TRUMAN TALKS TO PUBLIC HOUSERS

PUBLIC HOUSERS attack FHA as Congress cuts program

Public housing was amidst its most important legislative fight since passage of the 1949 Housing Act. In April, the House voted a crippling 5,000-unit-per-year ceiling on public housing. On June 3, the Senate, by voice vote, bounced that back up to 45,000 units.* But no cheers came from public housers. The Senate's recommendation was still 5,000 units below the level permitted public housing in the expiring fiscal year. Though the Senate action indicated the House cut would not stand in conference, it was also more and more possible that the compromise would be around 25,000 units—a big setback for public housing.

For the first time, moreover, this year's Congressional lid will be a meaningful regulator of public housing. This fiscal year, say experts, 50,000 units are about all that the Public Housing Administration could have put under construction anyway. But the program was fast gathering momentum. Only 10,200 of this fiscal year's 50,000 units were begun by January 1. PHA Commissioner John Taylor Egan has promised all 50,000 will be underway by June 30. Physically, PHA should be able to start another 50,000 units between July 1 and Dec. 30. Some observers, in fact,

*The Senate also erased Rep. Ralph W. Gwinn's anti-red rider, which would bar any member of an organization on the attorney general's subversive list from public housing. This had caused postponement of a \$167 million mid-April housing bond issue. On the floor, Sen. Richard Nixon (R, Calif.) was ruled out of order when he offered an amendment prohibiting public housing in cities (like Los Angeles) where a popular referendum has gone against public housing.

are betting this will be the public housers' strategy: start projects as fast as possible this fall and then come before Congress next January for authority to build more, particularly if the red-tape ridden private defense housing program falls into a slump.

Counteroffensive. Things legislative being the way they were, it should hardly have surprised builders that proponents of public housing last month opened a counter-offensive by attacking FHA. The new line was laid down by Manhattan attorney Charles Abrams in a talk to the National Housing Conference at Washington's Hotel Statler (AF, May '52, p. 51). Charged Abrams: "The smell of scandal lurks under FHA deals from Long Island to Los Angeles . . . I believe FHA is the reason for the anti-public housing lobby and as long as it thrives, public housing will be under attack. To conceal [private housing's] own form of socialization, public housing has been chosen as a target, not because it competes with the private builder but to divert attention from the mammoth socialization of risk which has been effected through FHA formula . . . The depredations under FHA if ever disclosed would make the Yazoo-land frauds look like a piker's handout."

Abrams offered five specific (but wholly undocumented) charges:

- ▶ FHA commitments are "salable . . . on the open market." Moreover, "there isn't another agency in government where a small-time official possesses the equivalent power to turn paper into gold by the stroke of a pen."
- ▶ Use of FHA insurance to develop hotels is an abuse of FHA's purpose.
- ▶ "Dummy leases under which speculators who buy land at nominal prices lease it to themselves at big rents have become routine."
- ▶ "Applications on FHA insurance are expected to misrepresent actual costs of architects fees, building costs, land costs and other items. FHA knows this and expects it."

Echoes & ripples. Other speakers zeroed in on the same target. Advised fair-dealing Sen. Hubert Humphrey (D, Minn.): "Punish those who punish you. Go on out and get 'em or they're going to get you." Needled Sen. Paul Douglas (D, Ill.): "The group that has received the largest guarantee against loss through the federal government is the group protesting loudest against government help to the low-income families." Urged John Edelman, Washington representative of the CIO Textile Workers Union: "[Public] housers need not go out and win over the voters. A better approach is . . . the mass organizations: the AFL, the CIO, neighborhood movements and church movements. Work through them in terms of their interest. Speak of employment to the building trades unions; speak of eradication of social disease to the

churches; speak of middle-income housing to the CIO . . . Get housing into the Community Chest."

At the final session, President Truman injected himself personally into the row in a surprise "whistle stop speech" to 400 NHC banqueters. Truman flailed away bitingly but unspecifically at his old target, "the real estate lobby," which he accused of "trying to choke public housing to death by cutting off appropriations." Urging NHC to back not only his demand for a 75,000 unit public housing program, but also other Administration policies, the Chief Executive remarked, "We might as well do a first class job of lobbying while we're at it." (Replying in kind, the National Association of Real Estate Boards reiterated its view that "political public housing . . . is inequitable, is a failure from the standpoint of slum clearance and rehabilitation . . . is in itself a long step towards communism.")

Policy stand. The Housing Conference spelled out its new policies in 17 resolutions which:

- ▶ Formally urged a Congressional investigation of charges that FHA and VA housing has involved "excessive speculative profits, . . . favoritism" and "improper financial and administrative practices."
- ▶ Deplored "reduction of space standards" in recent housing; urged Congress to require FHA and VA builders to give warranties.
- ▶ Asked Congress to approve the full 135,000 public housing units permitted by the Housing Act of 1949 next year.
- ▶ Urged FHA to require sponsors of co-operative housing under Sec. 213 to "make available" to prospective stock buyers the details of "financing, construction and management."
- ▶ Urged increasing use of vacant land for federally aided redevelopment projects. (Sen. Douglas remarked that this would violate the intent of Congress in enacting the program.)

Second round. Two weeks later, before a Manhattan conference on racial discrimination in housing, attorney Abrams expanded his attack on FHA. He asserted that from 1935 to 1949 the agency "advocated racial restrictive covenants." His explanation: "FHA was staffed by little men with little minds. Their prejudices, acquired in the suburbs in which they lived, were carried to their desks." Although since 1949 FHA has specifically barred its insurance from homes bearing racial restrictions, Abrams charged that "indications are that the old policy still prevails in the field."

Through the hubbub, the man most concerned, FHA Commissioner Franklin D. Richards, maintained a dignified, if pained, public silence. Asked by HOUSE & HOME for comment, Commissioner Richards wrote: "I wish that there were some way of answering vague and baseless accusations which seem to have the quality of making headlines . . . Any real study of FHA mortgage insurance, which is a completely voluntary system, will reveal its enduring benefits. . ."

Strike Wave Hits Building; Picket Line Violence Brings Injunction at Levittown

Spring brought a wave of strikes by AFL building tradesmen. Construction trades strikes are an old May custom, because many of the nation's major wage agreements expire then. But this year's crop of walkouts got a big boost from the Wage Stabilization's advance approval of a 22½¢ an hour wage and welfare increase. At the beginning of this month at least six major strikes were in progress affecting 14,600 workmen directly and an untold number indirectly. Settled in May were at least 17 more strikes, 12 of them involving wage or welfare disputes, five of them stemming from jurisdictional arguments.

At one point, the rise in work stoppages over which union was to handle which job so alarmed Secretary Joseph D. Keenan of the AFL Building and Construction Trades Department that he warned: Labor unions, by wildcat walkouts and jurisdictional disputes, are "literally cutting themselves out and if they don't stop bickering, labor will go back 20 years—and it will be hard to get back on top again."

Pitched battle. To homebuilders, the dispute at Levittown, Pa. commanded first attention. The AFL Building and Construction Trades Council of Philadelphia began a major effort to force builder William J. Levitt to use union labor for his 16,000-home development in nearby Bucks Co. As he has on Long Island for years, Levitt was building with an open shop. Moreover, the AFL objected to Levitt's waste-saving practice of allowing skilled mechanics to do a variety of jobs. It charged he was paying on a piecework basis (which Levitt denied).

On May 10 some 600 Levittown workers were unable to get to work because just about that many pickets were marching before the project gates. Car windows were smashed, tires ripped, rocks hurled, and some persons were hurt, though not seriously. On May 14 Bucks County Judge

Hiram H. Keller issued a temporary restraining order limiting pickets to five at each entrance of the \$20 million development. The next day there were still 150 pickets on hand (most of them walking their beat before going off to their regular jobs). A rock was flung through an auto windshield. No one went to work. On May 16, when Levitt tried to resume work at his concrete mixing plant, 400 pickets were there. Stone-throwers peppered the cars of workers, the workers themselves and work buildings.

State troops. A deputy sheriff charged with enforcing Judge Keller's restraining order phoned Gov. John S. Fine. Six state troopers soon arrived and by May 19 there were 40, armed with riot sticks. So were 200 pickets. A trooper stood up in an open patrol car. "You boys are acting in an unlawful way," he said. "So get going." The pickets melted down to the legal limit.

Judge Keller then issued an injunction limiting pickets to from two to five at 20 specified gates and the AFL agreed to comply. Said a Levitt spokesman: ". . . worst demonstration of labor lawlessness that the building trades of this area have ever attempted." Said AFL attorney M. H. Syme: "We do not condone violence . . . we condemn it and regret it."

Still festering. Six major strikes still going on across the country involved wage and welfare fund demands:

- ▶ Some 12,000 carpenters in the San Francisco Bay Area returned to work June 2 after winning their original demands: a 15¢ increase on their \$2.45 hourly wage, plus a 7½¢ employer contribution to the welfare fund. But thousands of other carpenters were still out in 42 counties seeking a 21¢ boost. The strike began March 31.
- ▶ In Chicago, 600 AFL Clay Workers struck eight brickmaking plants May 1 for a 15¢ increase on their \$1.56 to \$1.79 scale. Chi-



AFL PICKET HURLS ROCK AT TRUCK TRYING TO LEAVE CEMENT MIXING AREA AT LEVITTOWN, PA.

cago's daily production of 1,250,000 common bricks was knocked out. Work on 2,500 homes was halted. Construction on 90% of the city's commercial and industrial projects was delayed and 5,000 nonstriking craftsmen idled.

▶ In Chattanooga, carpenters, cement finishers, iron workers, operating engineers, laborers, and truck drivers struck May 1 for something in excess of the 22½¢ WSB-approved increase. Work stopped on homes and some 100 other projects.

▶ In Philadelphia, 1,000 operating engineers struck May 1 over some 40 issues including retroactive pay back to 1951, a pension plan, a 37-item safety code and working condition changes contractors call featherbedding. Philadelphia's public works program was tied up as well as state highway projects, utility and railroad work, including sidings for the new Fairless Works.

▶ In Niagara Falls, 1,000 carpenters, laborers and lathers stopped work on the city's new airport, an Army priority job.

▶ In Wilmington, AFL sheet metal workers struck seven contractors when they failed to agree on a health and welfare plan.

Jurisdictional disputes. The Fairless Works was further disturbed when 8,500 AFL bridge & structural iron workers left their jobs at the steel plant itself in a dispute with six other construction trades over who was to install machinery. It was the third such stoppage in recent months. After four days the AFL's National Board of Jurisdiction Awards abruptly ordered the men to return to work. At a new Atomic Energy Commission plant in Fernald, Ohio, a jurisdictional dispute arose between members of the carpenters and laborers union over who was to dismantle the wooden forms in which concrete was poured. After a scuffle in which two were injured, 1,000 laborers were told to lay off the rest of the day until tempers had quieted down.

There were two jurisdictional strikes in New Jersey, one between laborers and carpenters on who should handle the stripping of lumber; another between carpenters and iron workers over tubular scaffolding.

In St. Louis, a two-day jurisdictional strike at a new \$45 million Union Electric Co. power plant, oddly, did a great deal of good. The AFL Building and Construction Trades Council had long been considering the problem (said Council Secretary Joseph C. Payne: "These jurisdictional fights are hurting the council as well as the boys themselves"). Following the Union Electric trouble, 33 trades, representing 27,000 members, decided they had had enough: hereafter unions not directly involved would continue at work and ignore picket lines.



RENT CONTROL in critical defense housing areas (to the homebuilding industry probably the least known phase of the defense housing program) embraced its 103rd locality last month when Labette County, Kan. was clamped under controls. The 103 areas lie in 38 states (map, above). Biggest concentrations are in Texas (13), California (10) and around Chesapeake Bay (8). So far, 56 defense housing areas have escaped reimposition of rent control, which rolls back rents on private homes, apartments, motels, trailer courts and rooming houses regardless of date of construction.

Of the 103 localities, 14 had shaken free of defense rent control by local action. Rent czar Tighe Woods had not contested their decisions. But the Senate defeated an effort to amend the Defense Production Act to make it impossible for Woods to do so.

Builders' Ire Grows at Defense Housing Red Tape; 16,534 Units Begun So Far

Danger signals began appearing last month that homebuilders were getting fed up with the defense housing program. It was too soon to call it a trend. It might be just a bigger than usual wave of the industry's normal grouching. But more and more builders were sounding off about HHFA, FHA and even FNMA red tape—besides their continuing troubles with defense mortgages and lack of community facilities. A report to NAHB directors admitted "builders have lost some of their enthusiasm for the defense housing program. . . . Many of them are beginning to wonder about the real necessity (for it)." Other symptoms:

Community resistance, Pine Bluff, Ark. voted down a bond issue to finance water and sewer expansion necessary before builder Cotton Barnes could erect 150 defense homes for which he had FNMA takeouts. Reason: military expansion there fell behind schedule and the town was experiencing too many vacancies. While the Pentagon reassured Pine Bluff this was just a lull, the FNMA takeout expired and banks refused construction money.

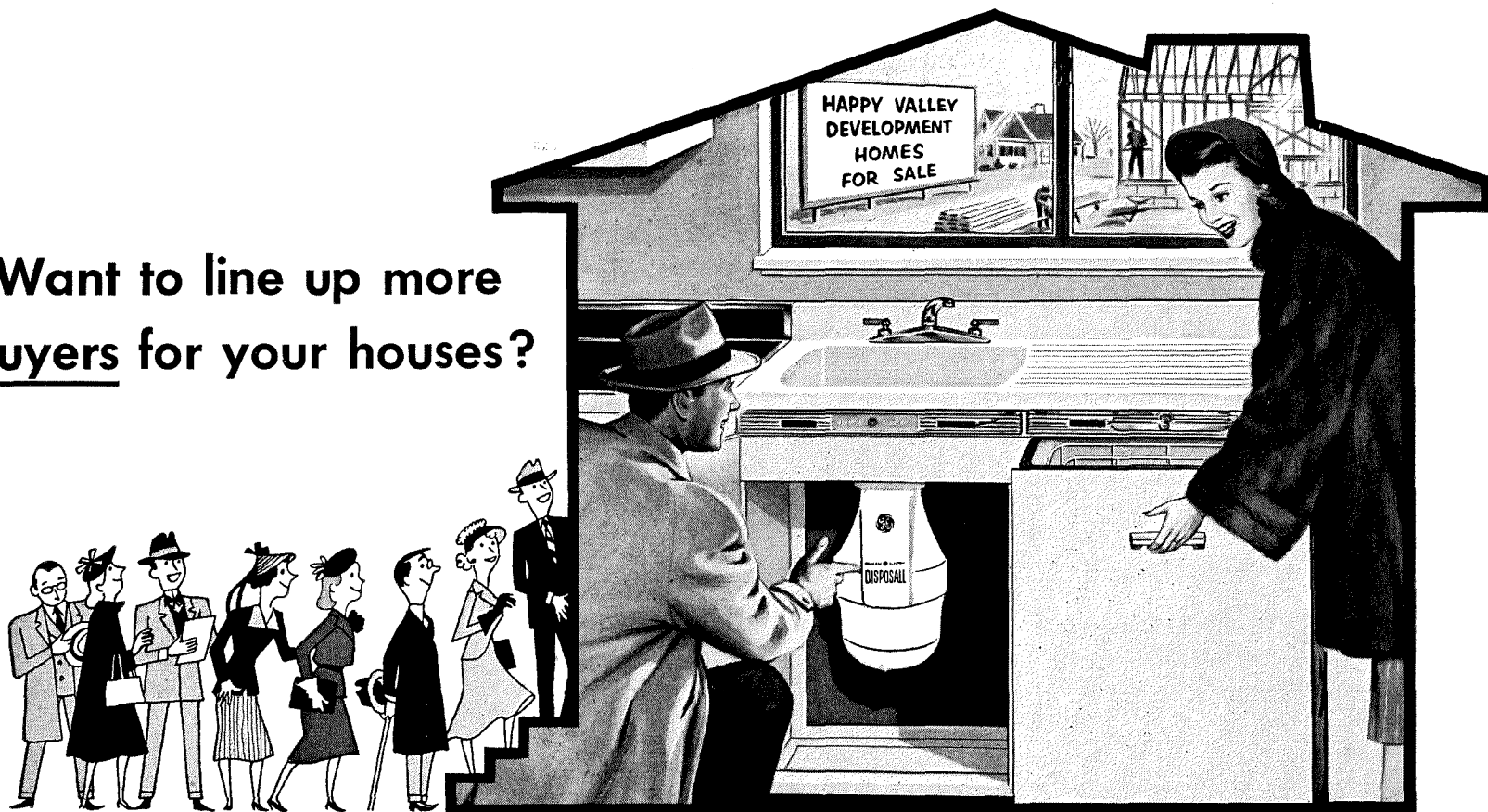
Builder Joe Merrion of Chicago, moving into the Quad City (Ill.-Iowa) area to build 300 defense homes, found costs so high he said he will get "a better deal" un-

der FHA Title II than under the defense housing program unless FHA agrees to use its discretionary power to boost mortgage ceilings from \$8,100 to \$9,000 in high cost areas. So far, FHA has refused to do this anywhere, builders charge.

'More hurt than help.' Said Chicago builder Nate Manilow: "The way it now works, the defense housing program hurts more than helps a community. Until they can eliminate some of the fuss and bother and red tape, I'm not interested."

Major administrative trouble so far cleared away by defense builders involved FHA valuations. Originally, FHA insisted on using its capitalization formula in appraising Title IX rental units (H&H, Mar. '52, p. 55). Builders found resulting commitments too low to permit construction. NAHB persuaded FHA to make three changes: reduce the vacancy factor from 7 to 2½%, shift maintenance and repair from a long term rental to a two year basis, reduce management cost allowances from 5 to 3%. Now commitments generally run high enough to persuade builders to proceed. By May 14, HHFA counted 16,354 defense homes under way or completed—some 20.2% of the 80,915 units programmed in 162 areas.

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ARMSTRONG'S LINOLEUM FLOORS

Bills on Housing, Mortgages, Rent Control Approach Semifinal Shape in Congress

In Congress, where politics shape the future economics of the US housing industry, the 1952 crop of legislation had sprouted far enough last month to give a good idea of how it will finally look.

▶ To bolster the still-prostrate market for defense housing mortgages, Congress appeared firmly committed to another \$900 million inflationary shot in the arm for Fanny May. Against labor and veterans' pressure, legislators would not even suggest a raise in frozen FHA or VA interest rates.

▶ The new GI Bill of Rights, already passed (361 to 1) by the House, would contain some kind of a clause requiring homebuilders to give a warranty on their product. NAHB was fighting a rear-guard action for modifications, but top brass of the association candidly warned members: "Don't kid yourselves. There's going to be a warranty. There's been too much trouble."

▶ The Defense Production Act extension seemed likely to tie rent control more firmly than ever to temporary defense economic powers. A June 30 logjam on appropriations was in sight. And housing agencies were finding rough treatment at the hands of appropriations committees. *Fuller details appear in the five stories below and on the next page:*

DEFENSE MORTGAGE market voted \$900 million FNMA aid

It took the half-dozen senators on the floor only five minutes last month to approve the 1952 housing bill exactly as it was offered by the banking and currency committee. There was no debate, not a flicker of opposition. The measure then went to the House.

The legislative speed arose less from the Senate's sense of urgency about providing a new mortgage crutch for defense housing than from the fact that the banking committee sliced the amount of federal funds to be authorized nearly 50% below the level in the original bill. With the cuts, most opposition melted away. As the bill passed the Senate:

▶ Federal National Mortgage Association would get \$900 million (instead of \$1.3 billion) for advance takeouts in defense areas. The \$360 million now set aside for defense areas would be available again for over-the-counter purchases of VAs and FHAs in nondefense areas.

▶ Additional FHA insuring authorization would be cut from \$1 billion to \$400 million.

▶ New outlay for community facilities in defense areas would be \$40 million instead of \$100 million.

▶ Public defense housing—still restricted to spots where private enterprise cannot handle the job or to temporary military areas—would get \$50 million instead of the \$200 million HHFA administrator Foley sought.

▶ Instead of an open-end extension, subsidized farm housing would get a one-year lease on life with a ceiling of \$2 million.

▶ Federal savings and loans would be empowered to make or buy FHA loans anywhere in the country. (Now, they cannot buy FHA mortgages more than 50 miles from their office.)

'No alternative.' Presenting the bill to the Senate, Chairman Burnet R. Maybank (D.,

S.C.) of the banking committee justified the inflationary expansion of Fanny May in language some mortgage bankers thought provided good evidence that the real trouble with defense mortgages is frozen FHA and VA interest rates. Said Maybank: "There is available no other ready alternative except advance commitments to get the needed defense housing started. There is no prospect of the mortgage market changing in sufficient time and (enough) to make an adequate supply of mortgage funds available to meet defense housing needs promptly."

Most irking to lenders, however, was resumption of Fanny May buying in non-defense areas. As Mortgage Banker Will A. Clarke testified at the banking committee's two-day hearings, "It is purely a matter of pricing a commodity. FHA and VA mortgages are priced out of the market." If interest rates were hiked 1/4%, he said, "the government would not have to pump a billion or so more into the market through Fanny May." Builders, however, were jubilant, thought Fanny May purchasing would thaw many a veterans' housing deal now frozen by lack of 4% money.

Restrictions for FNMA. The renewed privilege was hedged with restrictions. FNMA could buy only FHA and VA mortgages written since last Feb. 28 (except defense or disaster mortgages). Lenders could sell FNMA only half of their portfolio of these. Moreover, FNMA would no longer be required to buy at par—an effort, explained Maybank, "to prevent wholesale dumping by mortgagees of their less desirable loans."

One sense-making amendment which the banking committee ignored was offered by NAHB President Alan Brockbank. Instead of a 50% limitation, he suggested that a

lender be permitted to sell to Fanny May only as many dollars worth of mortgages as he buys after April 1, 1952. This would make Fanny May a "true revolving fund," he argued. HHFA administrator Foley squashed another NAHB proposal: instead of public defense housing, raise mortgage limits on Sec. 8, Title I FHA loans from \$4,750 to \$6,000, insure mortgages to 95% of cost (not value) and grant an unlimited FNMA market. Said Foley: "That would out-do Title VI."

APPROPRIATIONS for housing agencies upped by Senate

A Republican-Southern Democrat coalition in the House had voted a huge slice in appropriations for HHFA and its family of housing agencies (H&H, Apr. '52, p. 34). Last month, the Senate restored most of the funds to the independent offices appropriation bill. Samples:

ITEM	BUDGET	HOUSE	SENATE
	REQUEST	ACTION	ACTION
	<i>in thousands</i>		
HHFA administrator	\$ 6,250	\$3,606	\$5,606
PHA administration	\$11,420	\$7,000	\$9,000
FHA administration	\$ 5,631	\$4,885	\$4,885
Home Loan Bank Board	\$ 779	\$ 725	\$ 779
FNMA administration	\$ 4,140	\$3,371	\$3,647

HHFA did not escape without a rebuke, however. Annoyed at complaints that federal officials were junketing around the nation coaxing communities to incur debt by undertaking slum clearance and public housing programs, the upper chamber sternly asked HHFA administrator Foley to halt "such propaganda" by "restriction of travel or otherwise."

KOREA GI BILL heads for passage with warranty clause

Early this month, the House adopted the billion-dollar-a-year GI Bill of Rights aimed at giving Korea veterans an even better housing deal than World War II veterans have under 1944's GI law. Quick passage by the Senate looked certain. The new bill would cover men and women in uniform between June 27, '50, when American forces entered the Korean fighting, and a date to be set later by either Congress or the President. Chief features:

Loans—The government, as before, would guarantee up to 60% of a 4% loan on a home, farm or business with a maximum guaranty of \$7,500.

Discipline—The Veterans Administration would be given power to (1) refuse to appraise for builders with bad records in dealing with veterans, (2) refuse to guarantee loans made by lenders who fail to keep adequate accounting records, have not serviced loans adequately or have otherwise "engaged in detrimental practices." (Under the present GI law, all VA can do to builders who refuse to mend their ways is to deny them advance commitments.)

Warranty—Anyone selling a house to a veteran would be "deemed to have expressly warranted

... that the dwelling is constructed in conformity with the plans and specifications," would be required to correct any deviation or failures brought to his attention in writing within a year.

NAHB objections. If the warranty clause stayed in the bill when it became law, it would thus cover veterans who bought homes with FHA loans, too. Neither HHFA, NAHB nor mortgage bankers liked the idea. Builders despaired of killing the compulsory warranty in the House, but hoped to be able to talk the Senate out of accepting it. They argued that the legislation, by inviting veterans to squawk, would encourage an outbreak of petty grievances which would swamp VA in needless paper work, deluge builders in uncalled for complaints.

To illustrate its insistence that good construction cannot be legislated, NAHB had only to point to the other end of Pennsylvania Avenue. There, Harry Truman was finding many a minor defect in the renovated White House, which cost \$5.7 billion. Samples: dumb waiters stuck; some rooms were too hot, others too cold; the new incinerator did not work.

Rep. Olin Teague (D, Tex.), whose investigating committee has been running down complaints of shoddy construction for veterans, declared VA's proposed power to exclude the slipshod fringe of builders and appraisers would prove far more effective in cleaning up the veterans' housing program than the controversial warranty clause. As things stand now, he pointed out, one San Diego builder who was indicted after Teague committee disclosures simply moved to Reno and set up shop anew.

RENT CONTROL tied to prices, wages in Senate vote

Administration forces in the Senate wrested a watered down Defense Production Act extension from the banking committee, but it was obvious that they would have a close squeak pushing the measure through Congress before the present law expires June 30.

Opposition strategy was to weaken and relax controls rather than to eliminate them. Leaders of the Dixiecrat-Republican coalition feared the political consequences if they ditched wage and price controls only to find a new round of inflation at the height of the election campaign.

On the Senate floor, an amendment was offered by Sen. Everett Dirksen (R, Ill.) to limit extension of rent control to eight months (instead of 12 recommended by the committee). It carried 48-34. This will make rent control come up for renewal along with price and wage controls. Headed for Senate passage, the bill would also:

▶ Continue materials controls and power to impose credit Regulations X and W to June 30, 1953.

▶ Exempt professional engineers, architects and accountants from salary stabilization.

▶ Extend wage and price controls to March 1, '53 to give the next Congress a chance to review them as soon as it convenes.

In the House, sentiment for junking credit controls ran stronger. The House banking committee, adopting an amendment offered by veteran-loving Rep. Wright Patman (D, Tex.), voted 16-10 to kill all curbs on credit. Observers agreed the House would concur, thus leaving the future of Regulations X and W up to a Senate-House conference.

Rep. George A. Dondero (R, Mich.) readied an amendment to spell out in law the exemption claimed by home-builders from application of wage controls to their skilled worker teams. Meanwhile, the Construction Industry Stabilization Commission agreed to "restudy" its entire wage policy for homebuilding—including incentive pay and fringe benefits.

MILITARY PAY law raises quarters allowances by 14%

The Armed Forces pay raise act, signed into law by President Truman May 20, not only gave US military men a 4% pay increase, but also hiked their quarters allowances 14%. That meant that servicemen could afford to pay higher rents when the act becomes effective, July 1. The new allowances:

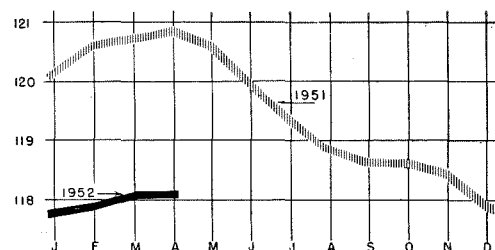
RANK	WITH DEPENDENTS	WITHOUT DEPENDENTS
Maj. Gen.	\$171	\$136.80
Brig. Gen.	171	136.80
Colonel	136.80	119.70
Lt. Col.	136.80	102.60
Major	119.70	94.20
Captain	102.60	85.50
1st Lieut.	94.20	77.10
2d Lieut.	85.50	68.40
	NOT OVER 2 DEPENDENTS	OVER 2 DEPENDENTS
Master Sgt., Tech. Sgt., Staff Sgt., Sergeant	\$ 77.10	\$ 96.90
Corporal, Pfc. and Pvt.	\$51.50 with one dependent, \$77.10 with two dependents, \$96.90 with over two dependents.	

LABOR PIRACY: Denver builder draws light penalty from WSB

Responding to a plea of guilty, the Wage Stabilization Board gave the Burns Construction Co., one of Denver's largest home-builders, the minimum penalty for labor "piracy." Burns was told it could not deduct \$4,618.84 as a business expense on income tax returns. This was the amount it had overpaid 37 bricklayers (at \$4 an hour instead of the prevailing \$3) and 19 hod carriers (at \$2.25 instead of the prevailing \$1.85) last spring. Had WSB wanted to be tough, it could have disallowed the entire payroll during the over-pay period—\$25,660—as an expense and withheld material priorities and allocations.

BUILDING, MATERIALS COSTS

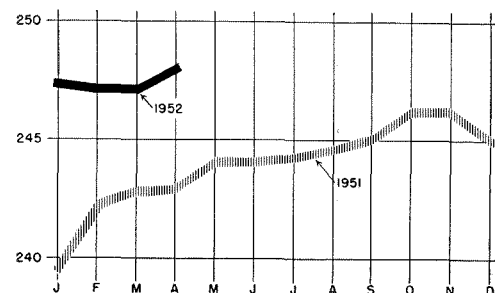
INDEX: 1947-'49=100



Source: Bureau of Labor Statistics

Over-all materials prices remained static, though lumber and plywood prices climbed a little for the first time in months. Price increases announced for sheathing grade plywood still do not cancel out last year's big drop.

INDEX: 1926-'29=100



Source: E. H. Boeckh & Associates

Housebuilding costs rose gently, pressured by rising labor wages and, in some communities, zoning ordinances which increased minimum plottage. Although the Boeckh index rose only from 247.3 in March to 248.1 in April, the rise may be augmented as more wage agreements are signed.

EQUITY SKINNING rising, VA warns; industry aid sought

Gullible veterans, strapped for cash and delinquent in GI mortgage payments, are losing their homes in increasing numbers due to "equity skinning" or "milking," reported VA last month. In a typical form of this legal racket, a veteran is approached by a smooth-talking stranger who offers to meet back payments if the homeowner will just "sign on the dotted line." The duped veteran then finds he has signed a deed and can regain his property only by signing a land sales contract at a much higher price. When he cannot meet the excessive terms of the new agreement, he loses his house.

Sometimes, said VA, the veteran with mortgage payments in arrears is coaxed into signing away his equity for a nominal sum plus the privilege of buying another house in a lower cost area. The veteran agrees to give possession in 60 days and when the interval is up, he is evicted and told no listings are available in the cheaper development.

There are plenty of potential victims. VA calculates that 10% of the 3 million home loans guaranteed since the start of the program have been in default for one month or more. Bankers and builders would do well to heed VA's advice to expose such practices in their own communities.

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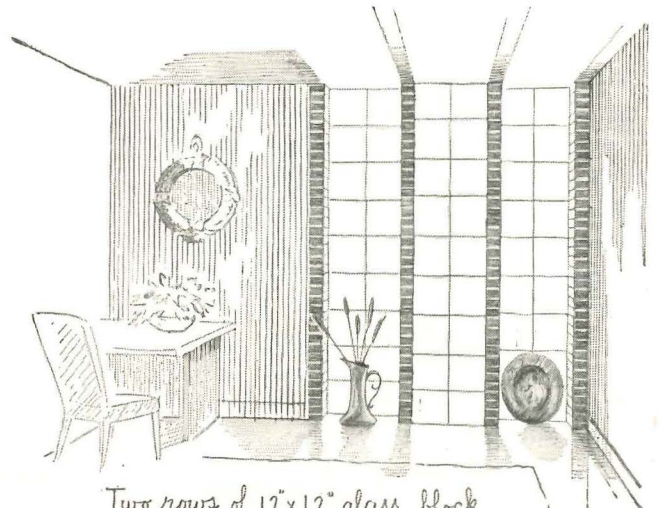


National Homes prefabricated panels and structural parts are commended by Parents' Magazine as advertised therein.

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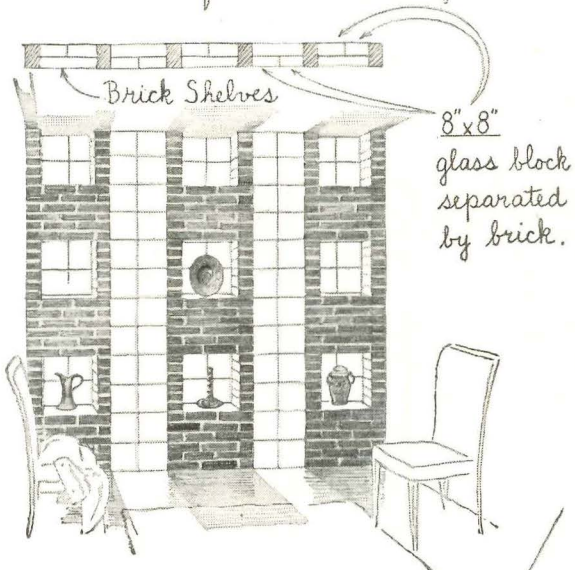


... from the
INSULUX sketch book



Two rows of 12"x12" glass block in staggered plane with vertical brick "fins".

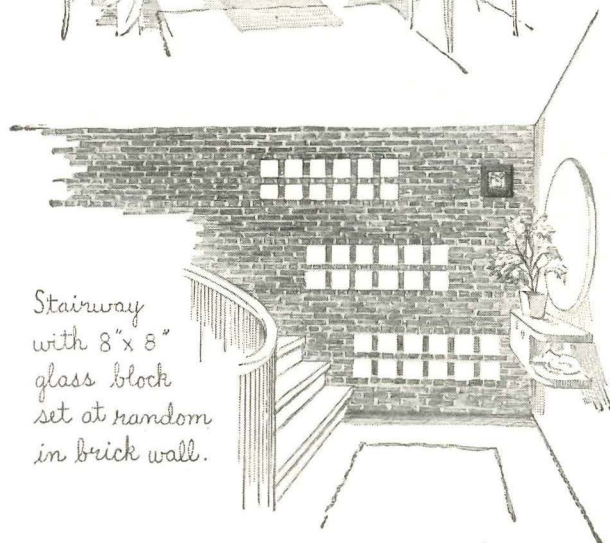
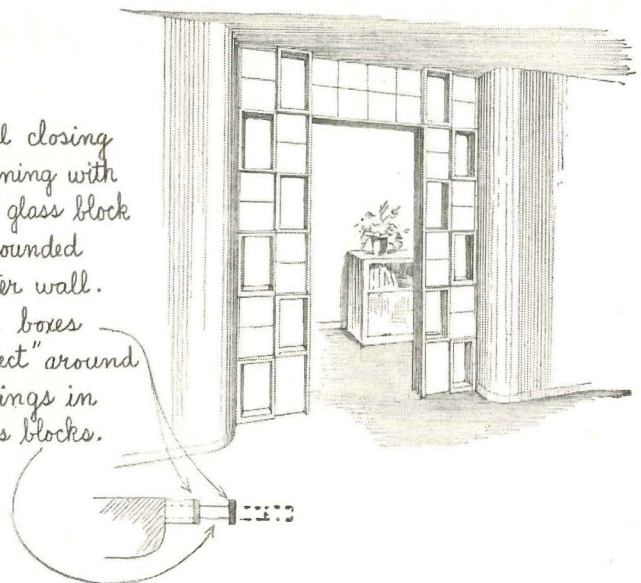
Panel of random clear glass block adds to the colonial charm of the entranceway.



Brick Shelves

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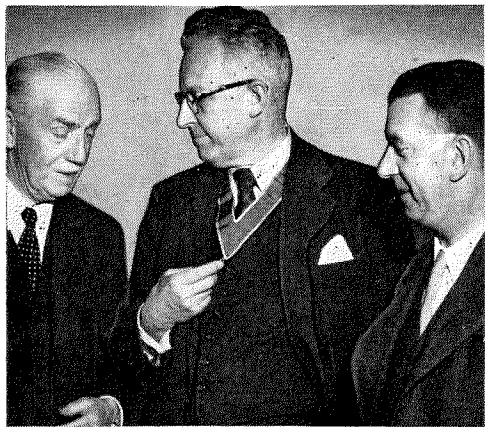


INSULUX GLASS BLOCK

A product of the Owens-Illinois Glass Company, Toledo 1, Ohio

mechanics lien foreclosure in the hopes of recovering \$28,000 in out-of-pocket money, architect fees and supervisory services which he lavished on his client's famous Plano, Ill. house (Oct. issue '51). Dr. Farnsworth, in turn, is suing Mies for \$33,872—the amount by which she claims Mies exceeded his original \$40,000 estimate. The master's opinion is not expected before the end of summer.

"In tomorrow's Britain," said **Andrew G. Henderson**, president of the Royal Institute of British Architects, "the cities will be growing up, rather than out. An Eng-



BRITISH VISITORS Andrew G. Henderson (left) and Royal Institute Secretary C. D. Spragg (right) chat with AIA President Glenn Stanton at Royal Architectural Institute of Canada Assembly in Vancouver.

lishman's home will likely be a walk-up apartment." The British architect, who stopped off at the AIA's Octagon in Washington to present a candelabra, also had words on redevelopment: "Now that the emergency temporary housing program of the postwar period has been concluded, Britain can afford the luxury of tearing down and redeveloping the Victorian Belt—the obsolete buildings encircling the center of most British commercial communities." As for incentive, Britain's Henderson reported the government, which controls all building, awards medals to the cities with the best designed housing projects. "The architect who can make a limited quantity of materials go the farthest gets the palm—and the most business," said Henderson.

Indiana had a new Federal Housing Authority director this month after a 4½-month hiatus. He is **F. Shirley Wilcox**, 57, onetime (1945-'48) Indiana collector of internal revenue and, until defeated for re-election in 1950, his state's treasurer. He succeeds the late R. Earl Peters who was dismissed Jan. 11 for violating FHA regulations by insuring his own investment in a Ft. Wayne apartment project. Hoosiers who recall Wilcox's succession of business ventures (automobile dealer, radio and

theater interests—but none in building) had a tart comment: "Strictly a political appointment."

Stocky **Robert H. Morris**, a 23 year veteran of *American Builder* magazine, resigned as publisher after five years of growing competition had cut heavily into profits. Newly appointed publishing director: Conrad J. Wageman. Morris and C. W. Smith of Southwest Research Institute began sounding out homebuilders on forming a syndicate to buy building materials for its members at quantity prices.

DIED: **Harry T. Kendall**, 69, board chairman of the Weyerhaeuser Sales Co. whose leadership in the industry had earned him the title "Mr. Lumber," May 2 while attending a conference of the US and Canadian Chambers of Commerce at White Sulphur Springs, W. Va.; **Edward J. Kelly**, 55, Chicago FHA director, May 6 in Chicago; **Francis G. McKelvy**, 68, board chairman of the Alpha Portland Cement Co. and one-time chairman of the Portland Cement Assn., May 7 in Easton, Pa.; **Edward H. Berger**, 58, asphalt consultant to Johns-Manville and a pioneer developer of asphalt roofing, May 12 in Roseland, N.J.; **Frances B. Johnston**, 88, pioneer woman photographer whose dexterity with architectural pictures won her a contract with the Library of Congress to photographically document historic southern buildings, May 18 in New Orleans; **W. M. Ritter**, 88,

founder of his own lumber firm in Columbus, Ohio and a pioneer developer of the Appalachian hardwood industry, May 21 in Washington, D.C.

The Fine Arts Medal—the American Institute of Architecture's highest award to creators outside its immediate field—will



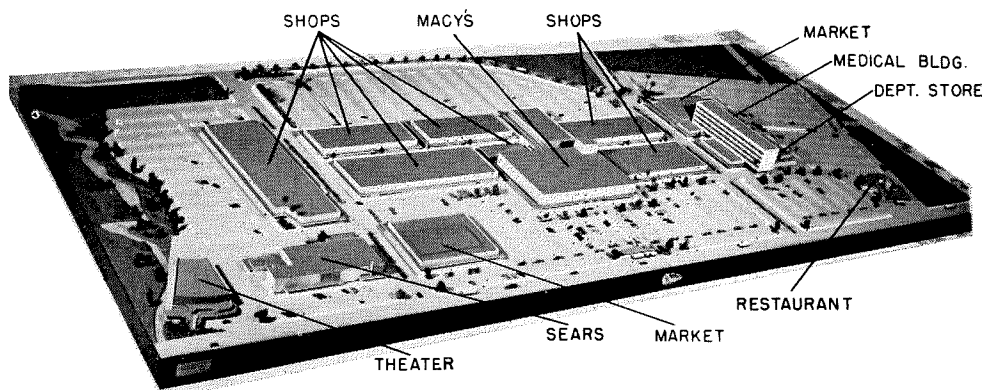
FREDERICKS

be given to Detroit sculptor **Marshall Fredericks** during the AIA's national convention in New York this month. Fredericks, 44, has been a heavy booster of collaboration among the arts. He did embellishment work for the University of Michigan War Memorial and the Detroit Veterans Memorial Bldg. Currently, Fredericks is working on projects at the Cleveland War Memorial, Ohio State University and Detroit's Fort Street Union Depot.

After four years as president of GE's Hotpoint, Inc., **James J. Nance**, 51, resigned to assume the presidency of the Packard Motor Company. An aggressive salesman and keen market analyst, Nance sent Hotpoint sales zooming from \$20 to \$200 million in four years. Ascending to Hotpoint's No. 1 job was John C. Sharp, 51 (elected president, general manager and a director), former vice president and chief engineer, with Hotpoint for 23 years.



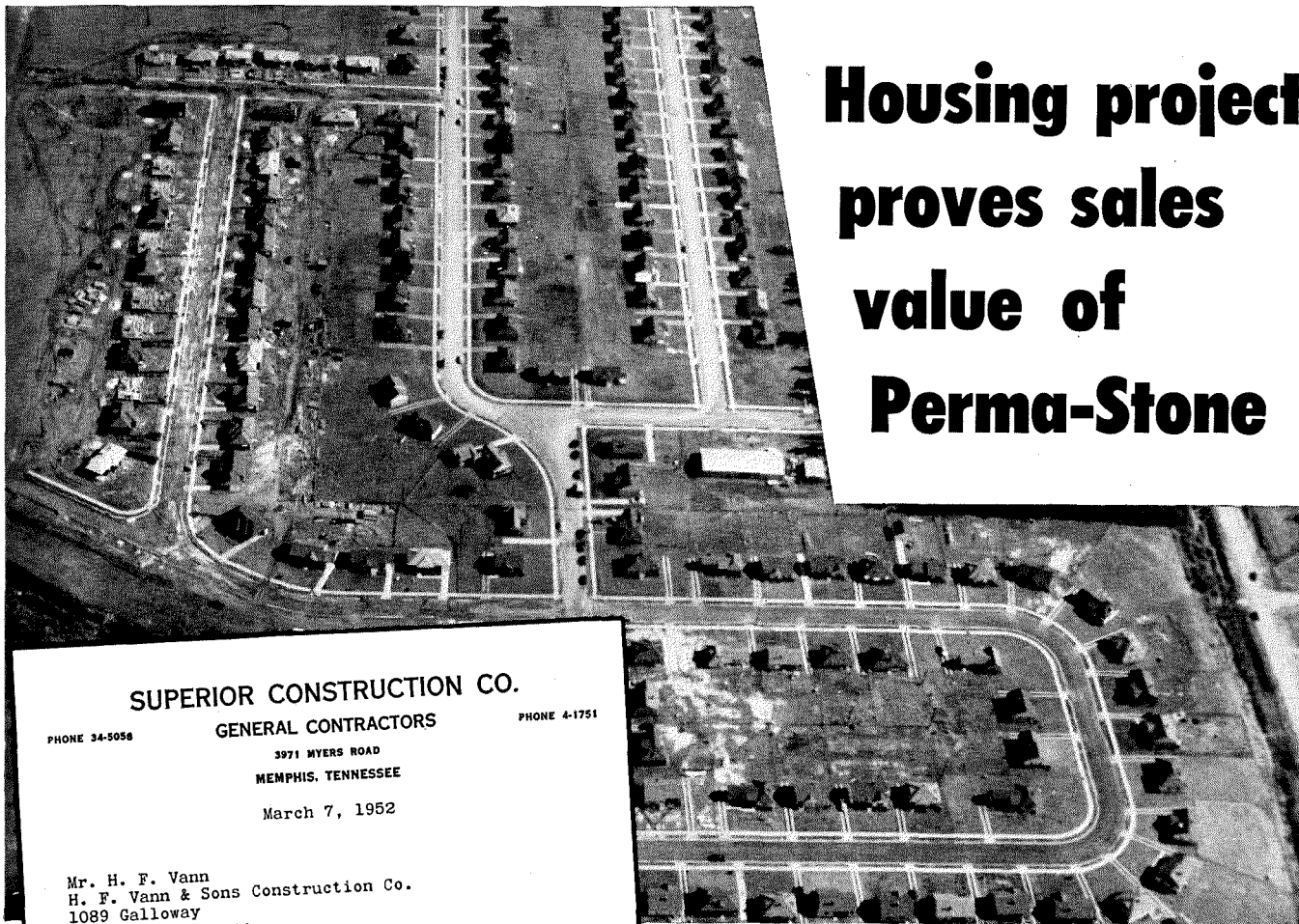
Gabriel Moulin



WESTERN SHOPPING CENTER to get Macy's biggest suburban store

Macy's announced it was about to build a \$6 million store, its biggest suburban branch yet, in Hillsdale on the San Francisco Peninsula. San Francisco architect John Bolles will design 5 acres of floor-space on three levels. Macy's will form part of builder David D. Bohannon's new 42-acre shopping center (model above) under the design of Welton Becket & Associates. The center will have 76 shops, including a five-story medico-dental building, an underground concourse for trucks and parking space for 12,000 cars.

Housing project proves sales value of Perma-Stone



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Now that the warborn housing shortage is over and the formation of new families has fallen off to around 700,000 a year, how can home-building keep on at 1,000,000 houses a year plus?

There is only one possible answer: for the first time ever, homebuilders must now create a replacement market and sell new homes at least 250,000 faster than new families are formed. In other words, the homebuilders must make their houses so much more desirable that fewer and fewer people will be willing to go on living in their old homes and more and more antiquated houses will at last be eliminated and torn down.

The replacement market potential is enormous. In the 20 years since Mr. Roosevelt found one-third of the nation ill housed, new construction has barely kept up with population growth, so some 80% of the population still lives in the same old houses as in 1932—except that now they are 20 years older.

Perhaps as many as 10,000,000 of these are ripe for demolition now, but since the war the pace of demolition has been only about 60,000 a year. At that rate, it will take until A.D. 2119 to wipe out the last of 1932's blighted dwellings.

The automotive industry now sells 84% of its new cars in the replacement market, whereas homebuilding sells only 6% of its houses in the replacement market (60,000 out of 1,000,000). This is because the auto makers make each year's new model so much smarter, so much roomier, so much easier and more economical to operate, so much more comfortable that very few people who can afford a new car stick to the old one.

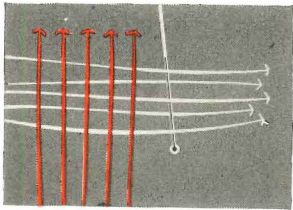
Why can't homebuilders start doing the same? The cheapest and most obvious places to start are these:

1. **Get a good architect** to improve the design of their homes, take off the Model T look, streamline their construction and build in more of the increased comfort and livability architects have been developing for higher priced houses;
2. **Make their houses a little bigger** and bring the room sizes at least up to public housing standards. Figures from both FHA and Bill Levitt agree that living and bedroom sizes could be increased 16% to 20% for only about \$200 a house;
3. **Stop crowding houses so close together,** especially on low cost land. Most of the criticism of the postwar tract developments could be silenced with a few more front feet at a net cost of less than \$200 per house;
4. **Take advantage of the package mortgage** to build in more labor-saving devices and sales appeal like dishwashers, refrigerators, automatic laundries, garbage disposers, television sets, wall-to-wall carpets, etc. (Some of this will have to wait until Regulation X is repealed, and perhaps most of it should be made optional at \$1 a month extra per unit.)

But right now homebuilding needs something really dramatic to make the home-buying public sit up and take notice that yesterday's house is just as obsolete as yesterday's car.

That is where air conditioning comes in, for there is no one new feature which could make such an impression at so low a cost. It is much less expensive to air condition a new house than an old one. It is relatively much less expensive to air condition a small house than a large one. It will become still less expensive as the manufacturers rethink their units for the builders' house market.

We can imagine no new sales feature which could do as much to make yesterday's house obsolete and create a whole new market for tomorrow's house.



air conditioning

Is air conditioning in for a boom?

Already in low gear and picking up fast, air conditioning may shift into high just as soon as credit restrictions are relaxed on houses over \$12,000. Air conditioning, the builders' newest sales tool, could develop into the greatest single feature to identify the 1953 model

"Five years from now a house in the Southwest without some type of refrigerated air conditioning, even though it is an 800 sq. ft. house, will be as obsolete as a house built today without a plug for a refrigerator."

When Texas builder Dick Hughes made that widely quoted statement at a "Trade Secrets" meeting last fall many builders thought he was dreaming and even most air conditioning manufacturers were inclined to agree. Air conditioning might be practical for the luxury house market, they thought, but the builder house would have to get along with an attic fan, window units or evaporative coolers. It didn't seem to be in the economic cards to install a central, mechanically operated refrigeration unit.

Six months ago a poll of merchant builders would have found almost none with active plans to install a central summer cooling system in houses selling for less than \$25,000. But in the past few months the residential air conditioning market has suddenly burst wide open. A number of builders who had been thinking about air conditioning for some time aggressively decided to get up and get going. Word also got around that Dick Hughes had built a model house which was to be the first of a new line with "thousand dollar" air conditioning. Dallas builders Lewis & Lambert, Laughlin & Silver boldly announced a project of over 200 fully air conditioned houses at \$12,500, and HOUSE & HOME helped to spread their significant story (*April issue*) to builders everywhere.

Air conditioning is not new. Woodcut of 1530 (right) shows three methods used in 16th Century mines to suction off heavy vapors by bellows. Top two versions work by horsepower with assists in the form of hay and whip. Third is manpowered. Miner is seen at the lower right. Rube Goldberg was not born until 353 years later.

The fact that Dallas builders were actually taking the plunge had a strong influence. Almost across the street Crow & Benda took action to air condition 125 of their \$12,500 houses. Other builders in Dallas (*see p. 85*) began making similar plans. One architect in Ft. Worth, Charles Armstrong, is doing plans for nearly 450 air conditioned houses. Houston, too, is booming.

In the dry Southwest where evaporative coolers have been used for years, there is a growing trend toward central refrigeration systems in higher priced houses, for the evaporative coolers, turning heat into humidity, fall down just when they are needed most. Starting in the Southwest and

The Bettmann Archives



the Gulf States, air conditioning in builders' houses has moved up through Ohio and spread to New England.

On the move north and east

Builders using a central summer cooling system are still few. But they are significant because they are forerunners of a larger group to come. They echo a remark by builder Clayton Wyman of Houston, "Tomorrow, any house without air conditioning will be like a house today that doesn't have central heating." Reports on 35 cities (p. 85) are proof that air conditioning in builders' houses is here to stay.

The builders or architects incline to scorn

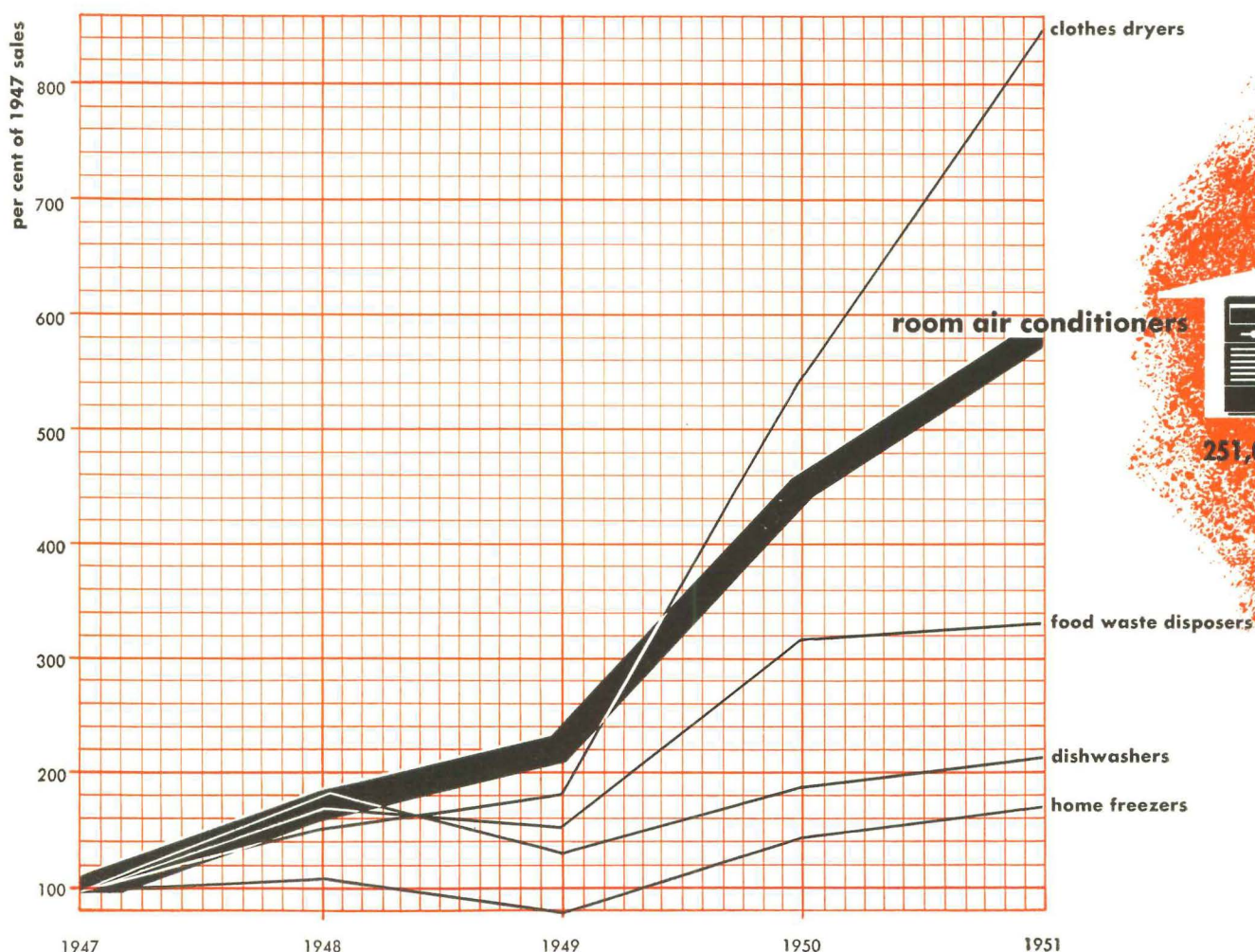
year round residential air conditioning as a specialty of the South and Southwest will be surprised to hear that no less than ten builders in the Philadelphia and New York City areas are experimenting with air conditioning right now. A builder in Stamford, Conn. is using air conditioning as a major sales tool. Westchester County's first summer-cooled project was opened two months ago. On Long Island and in New Jersey more than half-a-dozen builders are putting air conditioning in their houses.

Cincinnati builder Robert Wachendorf has put summer cooling in 18 houses at \$35,000 or over and plans to use it in 75 more. "It's a luxury now but it's coming to cheaper homes," Wachendorf says. "It's

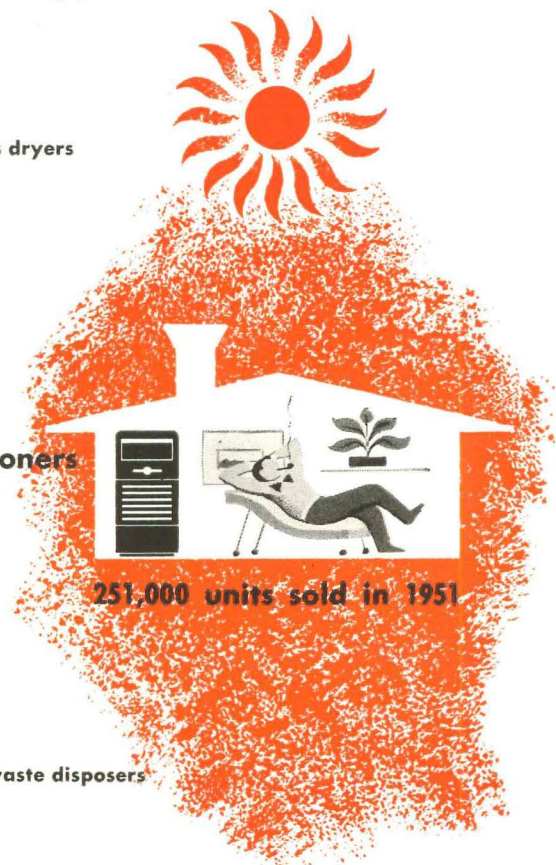
like a self-starter on an auto: first a luxury, then a necessity. We're coming to it." Arthur Radtke, air conditioning dealer, says, "Cincinnati is square in the middle of a pollen belt. It won't be much trouble convincing people that it's worth \$600 to \$1,000 more to get air conditioning."

The path of residential air conditioning will undoubtedly move from the South and West to the North and East just as summer cooling did in commercial installations. Before the war air conditioned drugstores and restaurants were far more common in the South and Southwest than in the North. Kansas City, for example, was far ahead of New York City in air conditioned stores and eating places. But now a restaurant in New

5 years' sales of air conditioning



 **42,900 room air conditioners sold in 1947**



data from *Electrical Merchandising*

IS AIR CONDITIONING IN FOR A BOOM?

York City that is not air conditioned loses all its summer customers. Every postwar office building in New York City has been air conditioned. It has been true the country over that when people work in air conditioned places they want air conditioned homes.

The big stumbling block: price

The high cost of a central summer cooling system is the one big obstacle. Scores of builders would add mechanical refrigeration to their heating systems now if the price was lower. Prices of various systems begin at around \$1,000 for a 1,200 sq. ft. house in addition to heating.

Prices today are based on neither a volume market nor the manufacturers' determination that the volume market is worth going after. Busy with their commercial sales and harassed by metal shortages, few big producers have made a serious effort to move into the residential field.

Air conditioning has been hard hit by Regulation X. If equipment raises a price from \$12,000 to \$13,000 the VA down payment is \$1,790 instead of \$960. An FHA buyer pays \$3,000 instead of \$2,400. Before Korea the FHA down payment would have been only \$200 more (\$2,600 vs. \$2,400). VA down payments could have been zero. Today a veteran must pay 80% of any price increase above \$12,000. An FHA buyer pays 60% of any increase between \$12,000 and \$16,000, then 80% of increases from \$16,000 to \$20,000 and 90% from \$20,000 to \$23,000.

FHA's Curt Mack says: "The inclusion of an appropriately sized and specified air conditioner or other air conditioning devices—such as cooler, or summer-winter hookups—would not of itself indicate a value less than its cost."

More efficient equipment

The same trend to smaller, more compact, more efficient units which has gone on in the heating field is beginning in air conditioning. Early residential units were identical with commercial units and were used in large houses where space was not a problem. But space is a problem to builders. Next to cost, the greatest headache for a builder planning air conditioning is to find space for equipment and ducts. Manufacturers know this, and are already at work making their units smaller and designing them for home use where cooling problems are different from those of stores and restaurants.

Will the public sell itself?

With some encouragement, the public will sell itself on the benefits of year round air conditioning. Americans love comfort and luxury and are willing to pay for them, as the history of the automobile clearly shows. The public insists on speed, horsepower, efficiency and luxury even in its "low priced" cars. The public will also buy better heating, larger TV sets and pay millions for health items like vitamins once it is sold on them.

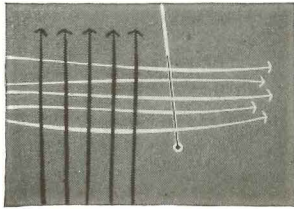
In year round air conditioning the builder has a greater potential sales appeal than in any device since central heating replaced the coal stove. *Cooling* is only part of the sales story. That may be enough in Texas or Arizona but in a large part of the US the plus-values of air conditioning may turn out to be even more attractive. Getting dry air in summer may be of more importance than getting cool air. Clean air year round, from which dust and dirt are removed, may revolutionize housekeeping. Air that is filtered not only is cleaner, but pollen and other irritants can also be removed. A combination of special filters, ultraviolet lamps and deodorizer lamps in the ducts can reduce smells, germs, allergies and provide air that is "hospital clean," as one builder tells his prospects. The health angle might come to be the biggest sales argument in favor of air conditioning.

Air conditioning

may be the greatest sales attraction a builder can offer and the one feature that makes his house a 1953 model

To keep their million house per year market, merchant builders will have to develop a replacement market of at least 300,000 houses annually. They must get that many old houses junked because people leave them to move into better homes.

They might take a page from the automobile manufacturers' book. No one questions why the new cars sell year after year. Old cars are made obsolete by a succession of improvements that have made wanting a new car almost a national habit. But houses don't go out of date. Once the average man has bought a house he sees no advantage in moving unless he can get a very much better house. Air conditioning may be the incentive which will convince him that he wants a better house.



air conditioning

What are the plans of the merchant builders?

Houston leads the way

Here are results of a 35-city survey on residential air conditioning. It reveals that an amazing amount of activity is going on. Reports on Dallas and Houston are given in some detail, because what is happening there today may well happen in many other cities tomorrow.

The local Chamber of Commerce proudly claims that Houston is the most air conditioned city in the world. It has impressive figures to back up this boast. More than 2,100 houses are cooled with central systems and in addition more than 48,000 houses have window units or small room coolers. Nearly 4,000 commercial installations have been made.

In only one way does Houston bow to Dallas: last summer some 500 Cadillacs were air conditioned in Dallas and only 300 in Houston—perhaps because the Lone Star Olds Cadillac agency that developed the system is in Dallas and word got around there faster. Throughout Texas close to 1,200 cars were air conditioned by this one firm, 95% of the Cadillac owners paying \$695 for the privilege. Air conditioning has obviously arrived.

Houston may have more big houses that are air conditioned than all the rest of the country put together, provided Dallas is not included. No one knows how many big houses in exclusive River Oaks have central systems, but in smaller and newer Tanglewood where the average house costs above \$45,000, the management estimates that over 75% are air conditioned.

A poll of Houston merchant builders in the over \$30,000 field shows that about three-quarters agree with builder *Don Teachworth* who says, "Air conditioning will help to sell any house," and *J. H. McQuown* who says, "It is foolish to build higher priced houses without air conditioning." A few are less emphatic, feeling that while air conditioning helps to sell houses put on the market in summer, it doesn't necessarily in winter. A number of big houses are being built with ducts sized for summer cooling and space left in the equipment room for a cooling unit, but the actual installation is up to the buyer.

It is highly significant that a man ordering either a custom-designed or a speculative house now realizes that in the Houston market his house will have less resale value if it is not air conditioned. Last year *Robert Straus*, an air conditioning distributor, moved into a handsome new house and had no trouble selling his old house because it, too, was air conditioned. But the man who bought the old house had serious trouble selling *his* house, because it lacked air conditioning.

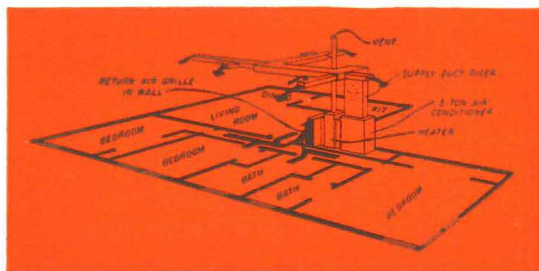
Houston merchant builders watching the boom in large-house cooling note that air conditioned apartments are always 100% rented when plenty of noncooled apartments at the same price remain empty. They know that house buyers want air conditioning, but can they pay for it? A number have decided they can, and are going ahead.

MERCHANT BUILDERS' PLANS



P. S. Luttrell built the house at the left as an experimental model to try out air conditioning, truss roof construction and freestanding storage walls. On the basis of this house, he is set to start building a production line house this fall.

House at right is air conditioned model now being sold by Ira Berne in Houston. It was a stock model to which he added air conditioning. It has been on the market only a short time and if his buyers seem to want summer cooling, Berne will redesign this house to make it more efficient.



P. S. Luttrell, one of Houston's big builders, sells houses from around \$10,500 to \$15,000. "We saw air conditioning coming," he said, "and began working on it a year ago. Thus far we've had no trouble selling our houses, but some day the buyer will walk past our uncooled houses without going in to look at them. I believe air conditioning is one way to keep ahead of the procession—and keep people coming in to see our houses. I'd say 75% of houses will be air conditioned in three years if they sell at over \$12,000."

Luttrell has already built one experimental house with air conditioning (see above) but he plans to spend the summer working out his plans to reduce air conditioning costs through more efficient design with architect Ned Cole. By fall he hopes to start a new development that eventually will have 1,500 air conditioned houses.

Builder **A. J. Whipple** believes that a two-car family can be educated to air conditioning fast, hopes to start proving this in a 600-acre development this summer. First he will "try out the idea" in a group of \$16,500 to \$22,000 houses. Whipple thinks 10% of the selling price of a house is enough to pay for both air conditioning and heating, already has a bid of \$1,600 for heating and cooling equipment but he is still shopping around. Four architects, working on his new plans, are seeing to it that even if people don't buy air condition-

ing, they will get the proper sized ducts and an equipment room that will take a central unit. Having built 2,500 houses in Houston, Whipple's switch to air conditioning will undoubtedly influence the market.

Ira Berne, who has closely watched the merchandising methods of his friends Bill and Alfred Levitt, has already put centrally air conditioned houses on the market in his Westwood development. He sells one model without air conditioning for \$13,250. The same house with a 3-ton Westinghouse unit sells for \$14,500. Both houses have three bedrooms, two baths, and both a garage and carport. The house without air conditioning also has a screen porch (see plan p. 114). Other models in Westwood sell from \$9,000 to \$13,000.

Berne is frankly experimenting. What he learns in Houston should be of interest to builders throughout that wide area. "I'm testing air conditioning in an arbitrary market," he concedes. "Anything over \$12,000 today pays a premium because of Regulation X. We don't know much about this market and we'll have to try it out. Everyone says he'll buy an air conditioned house at this price, but such talk doesn't mean much. If I sense there is a mass market at this price we'll try to get the price down by redesigning the house for air conditioning. If I can sell one or two a week I'll put them in a higher-priced neighborhood and advertise them."

His air conditioned model, one of his standard houses, was not designed for air conditioning. MIT engineer *Sid Atlas*, whose firm probably does more residential installations than any other in Houston, said he could cut \$200 or \$300 out of the system if the house was designed around the equipment with a 2-ton unit, central plenum and short ducts leading to each room. In a redesigned house, a 2-ton unit would be cheaper and as efficient.

Berne had sold five of his first eight air conditioned houses in the first three weeks they were on the market. They were scattered among his other houses, were the highest priced he had, and were not advertised. Under these circumstances, he feels encouraged to go ahead. However only some really hot weather will make the test valid.

Builder **Dewitt Krahl**, who has used air conditioning in ten of his \$30,000 to \$40,000 houses, says it definitely helps to sell houses in that price class. He also puts \$2,500 worth of air conditioning in some \$16,000 houses, which raises the price to \$18,500. He says that a large part of the cost of the air conditioning is added to the down payment and this eliminates many prospects. He is in favor of a central cooling system but feels that in the \$14,000 to \$16,000 market people cannot afford the extra down payment until Regulation X is canceled.

Builder **William Borden** is looking for a 3-ton air conditioning unit which he could buy for \$1,200. If he found a satisfactory one, he would put it in some \$12,000 houses.

Builder **Andy Kivlin** admits he's on the fence about air conditioning. He builds about 15 houses a year at \$30,000 to \$60,000, air conditions all of them. But he is also eying the \$12,000 to \$14,500 market and thinking about summer cooling such houses. He would like to build 50 or 60 at that price to experiment with the market and if the houses are a success he might build twice as many next year.

Engineer **J. S. Norman Jr.**, a member of his father's building firm, is trying to get a residential air conditioning unit with an air cooled condenser (and no water tower) which would operate for around \$5 per ton a month. He is working with a local firm to develop such a unit, and when they get it, they'll use it in 125 or more \$10,000 to \$15,000 houses a year. Norman says: "I really believe that air conditioning is coming and coming rapidly. In three years it will be as common as an attic fan."

Builder **J. A. Kelly** is planning 30 houses at from \$20,000 to \$22,000 with air conditioning. Dealer *B. W. Keeland* reports that "lots of builders are interested in air conditioning. It's just a question of money."

W. W. McMillan, undoubtedly the pioneer of all merchant builders in Houston, put 2-ton central units in 26 houses at around \$10,000 some 18 months ago. Despite the fact that he sold them all, this experiment did more to discourage air conditioning than to help it. Other builders say that people who bought the houses could not afford the operating expense. Dealers in air conditioning equipment say the installer cut his price so low he lost money and went out of business. The mortgage bankers who handled the deal claim the houses were a success from their point of view. McMillan himself says the idea was so new that neither FHA nor VA would give him credit for the cooling equipment, so he had to sell a house at the same price with or without air conditioning. Temporarily out of the building business, McMillan plans to air condition the next houses that he builds. "I think it's the coming thing. In five years it will be impossible to sell even a \$10,000 house without air conditioning."



As for the VA and FHA, their attitude has changed with the times. *Ralph Andrews*, VA loan guarantee officer, has said, "In the moderate priced house air conditioning provides cleaner air and more comfortable living during the humid summer months. It is a deterrent to sinus. Included in the

mortgage package air conditioning is an investment, not an expense."

FHA finds air conditioning in houses at \$16,000 and up no problem since buyers do not use FHA financing. Below that figure the chief problem is monthly operating cost. They feel if air conditioning adds something like \$30 a month, it may be too high for many families. No one knows yet exactly what monthly costs will be, but whatever they are, families will be screened more carefully by FHA to make sure they can afford it. They feel strongly that \$10,000 is too low for air conditioning at today's price. A second problem they face is: Will the equipment wear out in ten years? FHA's present attitude is one of watchful waiting, but they will do nothing to impede the sale of air conditioned houses to families that can afford them.

Like several electric power companies in the South, the Houston Electric Co. sells more power in summer than in winter. During the hot months, everyone in town turns on all the fans, coolers and conditioners available and there is also a much greater load from all the commercial installations, such as restaurants.

As a result, Houston Electric has to buy power from the North. The company has not stopped a builder from adding air conditioning, but it certainly has not encouraged him. But the power company is increasing its capacity to have plenty of electricity by next summer.

Dallas is an air conditioned town

Last summer's scorching weather seemed to break all records in Dallas. The temperature got above 100° and stayed there for weeks. Despite this unhappy memory, a small group of men in Dallas smile at the thought of more hot weather.

Said one air conditioning dealer as he leaned out of his car window last month, "Smells wonderful out there. The asphalt's melting!" Last summer 9,170 window refrigeration units were sold (compared with less than 1,000 in 1947) and over 21,000 evaporative coolers. Some 376 houses had a central cooling system added. These averaged nearly 8 hp each, showing that the houses were good sized. This year the Dallas Power & Light Co. reports sales are up at least 25%.

In general, the residential situation in Dallas runs pretty much the same as in Houston. A dozen or more builders of high priced houses who use air conditioning say, along with *S. A. Lewis*, "It sure helps to sell 'em." "It is essential to put in air conditioning," says builder *W. H. Malone*.

In residential heating Dallas has progressed from floor furnaces in 1946 to today's stage with air conditioning added to heating. At each stage, says builder *Clayton Wyman*, people complained that they couldn't afford the new system, "but each time we found that some people would pay more. Now everyone has discovered that you don't have to be rich to afford air conditioning. It's worth its cost for the dehumidification alone."

MERCHANT BUILDERS' PLANS

George Mixon puts air conditioning in his houses at \$20,000 to \$25,000. He feels he helped to pioneer air conditioning in apartment houses in Dallas and is proud that his units are fully rented and have a waiting list while many other apartments are empty. He puts oversize ducts in his speculative houses and prepares the house for air conditioning, then he lets the buyer decide whether he wants to put in the equipment. Now paying around \$3,000 for a 5-ton unit in his larger houses he hopes to get the price down to \$2,000. This summer he is starting a new group of 1,600 to 2,000 sq. ft. houses and will add air conditioning.

"Air conditioning in Dallas is coming in by leaps and bounds," said **Paris M. Rutherford** of the Dallas Power and Light Co. "People have made up their minds to be comfortable regardless of cost."

The trend to air conditioning has the blessing of at least one of the big mortgage bankers in Dallas. American General Investment Co. sold the mortgages on the first group of air conditioned builders' houses. **Alden Wagner** says, "From the success that the Lewis & Lamberth, Laughlin & Silver houses had, we know that people in the \$12,500 price class want and will pay for air conditioning. We believe that air conditioning gives us a house that will be more readily salable if we have to take it back."

The LLL & S houses (H&H, Apr. '52) have undoubtedly had an influence in Dallas. "We have had numerous calls from other builders," said **Jack Lowe**, whose firm sold the air conditioning equipment. "Crow & Benda have ordered 125 2-ton units for their houses and we know we'll sell more when others get their plans farther along."

The Lewis & Lamberth, Laughlin & Silver houses have broken no sales records, the builders report, but are selling better than other houses in the \$12,500 to \$13,000 price class. The \$1,750 down payment stops many people who would like these air conditioned houses.

Latest plans are to add a two-bedroom brick veneer house which, with the 2-ton GE air conditioner, will sell for just under \$12,000. It will be a truss roof design and will not have the cement pipe return ducts under the slab. There will be no return ducts and return air will enter the equipment room through louvers in the door. The design of the three-bedroom house (see photograph) remains unchanged.

Builders **James Crow** and **John Benda** have 125 lots now plus another 80 next door. **Charles Armstrong** of Forth Worth designed the two-bedroom models with 1,050 to 1,075 sq. ft. and three-bedroom

models with 1,130 to 1,150 sq. ft. that Crow & Benda will build. Prices will run from \$12,700 to \$12,900. All houses will be brick veneer and will have carports. Crow & Benda hope to have houses on the market by late July. Dallas buyers of homes over \$12,000 prefer brick construction, and the fact that Crow & Benda will offer brick may give them a slight advantage over the Lewis & Lamberth, Laughlin & Silver project next door. Another difference is that the air conditioning system will cost slightly less in the Crow & Benda houses, as there are no return ducts under the slab. Crow & Benda are putting 2 x 4 screeds between the wood floor and the slab and will use this area as a return air space.

Angus Wynn is planning 40 houses at around \$13,000 with air conditioning and hopes to get them started this summer.

Builder **Vernon Smith**, current Dallas president of NAHB, is outspoken about summer cooling. "In June and July you can't build enough air conditioned houses here to take care of the buyers. Our NAHB directors met last night and while they are not building air conditioned houses now, they are considering them for the future. All believe it is only a question of time—that air conditioning will be here soon. But they are waiting for prices to come down."



Typical Dallas house at over \$50,000 price with air conditioning

Right: Lewis & Lamberth, Laughlin & Silver houses

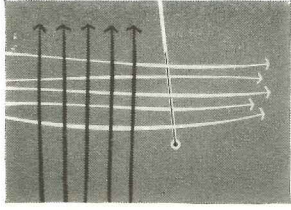


Photos: Acme; Ulric Meisel—Photo Associates; Langley Studios.

Using forced draft towers, builders can put cooling unit and tower in garage.



(Continued on page 96)



air conditioning

How are architects designing for air conditioning?

Architectural planning can strikingly reduce the cost of cooling

The two Texas houses on the next six pages illustrate some of the plan and design steps architects are taking to make summer cooling less expensive by reducing the amount of outside heat that gets in and has to be taken out.

The sun is the greatest enemy of the air conditioned house. The less direct sunlight and outside heat permitted to enter a house, the lower the cost of buying, installing and operating an air conditioning system, and the more satisfactory the results. Controlling solar heat means keeping out hot summer sun, which works against the air conditioning plant by increasing its cooling load (just as it means letting in winter sun, which works with the heating plant by decreasing its heating load).

In an uninsulated one-story house, twice as much sun heat will come in through the roof as will come through the walls and windows of all four sides combined.

A two-story plan can cut the roof area of a house in half, thus reduce the heat transmission through the roof in proportion.

Through the sides the biggest heat gain comes from sunlight streaming through unshaded windows, particularly on the west. Conducted heat coming in through windows and side walls is a lesser problem, and there is practically no problem at all with convection, for the higher air pressure normally maintained by the air conditioning plant inside means that almost the only hot air that gets in is the supply air sucked in for ventilation.

If the house is properly designed to meet these problems, 1 ton of cooling should be enough for a little over 500 sq. ft. If the house is not properly designed, 1 ton of cooling may not be enough for even 300 sq. ft.

So, more and more architects are beginning to use these primary design tools:

1. **WHITE OR LIGHT COLORED ROOFS.** These will reflect nearly half the sun heat that is absorbed by a dark roof.

2. **INSULATION.** This is most important under the roof, also important on the west wall, helpful on the south and east, useful only for winter heating on the north. A well insulated white roof will let in only a quarter as much heat as a dark roof without insulation.

3. **SUN SHADES.** Shield all windows on the east, west and south with sun screens, jalousies or side overhangs. (For a variation of this, see the vertical sun screen on page 90.)

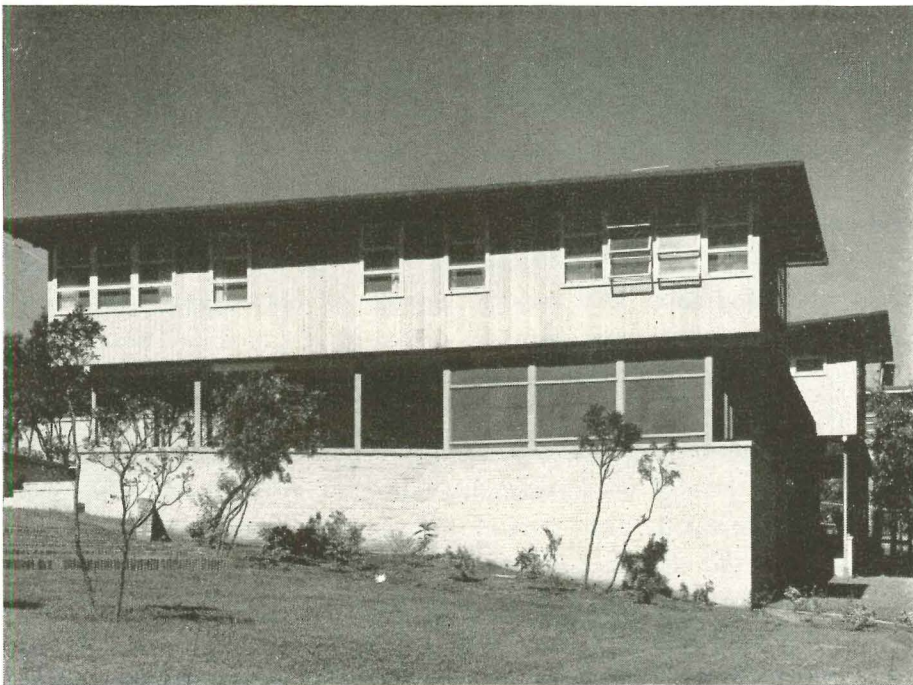
4. **SOLID WEST WALLS.** Put as few windows as possible on the west side, where even a 4' overhang cannot keep the afternoon sun from shining right in at the hottest time of the day. Try to place rooms that require few windows—carport, garage, utility, storage—on that side. A fully air conditioned house is not dependent on cross ventilation, so any

room can have a blank west wall. Important by-products of solid walls: lower heating costs, greater freedom of furniture arrangement.

5. **LANDSCAPING.** Use trees and shrubs, vines and hedges—to keep the sun off roof, windows, and wall areas. A house strategically placed among trees takes advantage of their natural shade to help its mechanical cooling process inside.

6. **HEAT-ABSORBENT GLASS, DOUBLE GLAZING.** The former will pick up 40% of the sun's heat (though some of this will be passed on to the inside by conduction and reradiation after the glass heats up). Its blue-green color also minimizes glare and makes the house look cooler. Double glazing is most useful in winter, when the difference between inside and outside temperatures may be as great as 60°, but is only a small factor in keeping the house cooler in summer, when the temperature differential is less. Double glazing with heat-absorbent glass as the outside layer combines the advantages of both.

1. THE VENTED HOUSE opens its windows to favorable breezes, uses its air conditioning only when necessary



East side of bedroom wing is open to prevailing breezes; bedrooms have awning sash, living room, below, a deep partly screened porch.

This house was planned so that it could be cooled and vented either by natural ventilation or mechanical refrigeration.

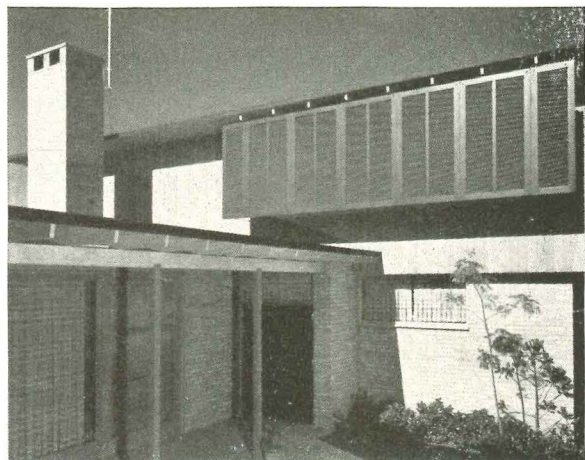
Unlike Dallas, San Antonio rarely has uncomfortably hot nights, and several months of the year there is a favorable easterly breeze. So, in this house, and in all the houses Architects Ford & Rogers have done in the area, they have made window openings big and east-facing when possible, always shielding them with porch roofs, sun-shades or planting. "Then we cut out all the west sun we could with blank walls well insulated. Where it seemed wise to put in a bank of west windows for light, cross ventilation or a glimpse of the garden [notably in the stair well of this house], we hung shutters vertically from the overhang, 30" from the wall."

For natural cross ventilation, they strung the floor plan out in an H shape, so that at no point is the house more than one room thick. Bedrooms and living room, faced east towards a view of a gentle green valley and a cooling summer breeze, were given generous areas of movable awning-type windows and sliding glass walls that can be used for ventilation when the outside temperature is below 80°.

Cooling load calculations indicated that ten tons of refrigeration would be required to cool this 5,039 sq. ft. house down to 82° when the outside temperature is at the 100° mark. But such a temperature differential was not considered necessary: the owners didn't demand it and it would have been too expensive. So the architects, engineers and owners decided to install only seven and a half tons, which has proved satisfactory.

LOCATION: San Antonio, Texas
O'NEIL FORD & JERRY ROGERS, Architects
ARTHUR BERGER, Landscape Architect
BIBB BROS., General Contractor

Photos: Ulric Meisel

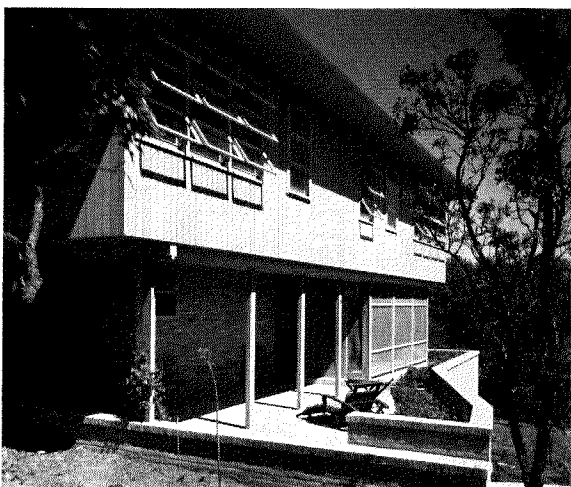


West side of bedroom wing (photos above and opposite) faces a patio garden. Three important design elements are used here to block hot sun: a nearly blank wall with a small, curtained window; roof and porch overhangs to west and south; a lowered sun-screen 30" out from windows.





Living room has floor-to-ceiling glass strip to north; full glass wall and screened porch to east. Note ceiling cool and warm air register.



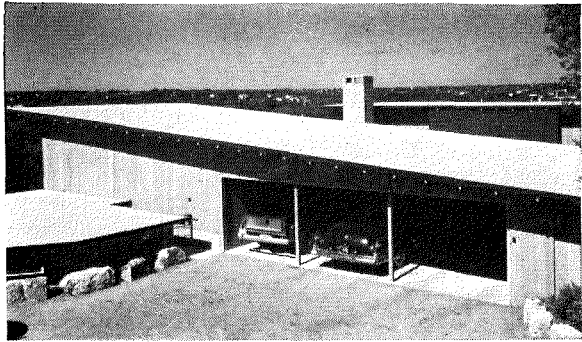
Open east porch is insect-screened outside living room. Awning sash above scoops valley breezes into bedrooms.

Living and dining areas are open to breeze, yet are shielded from south sun by deep porch, which also serves as sheltered entry walk.



Steps, left, lead down to garden court from higher hillside level. Second floor windows light the owner's workshop.

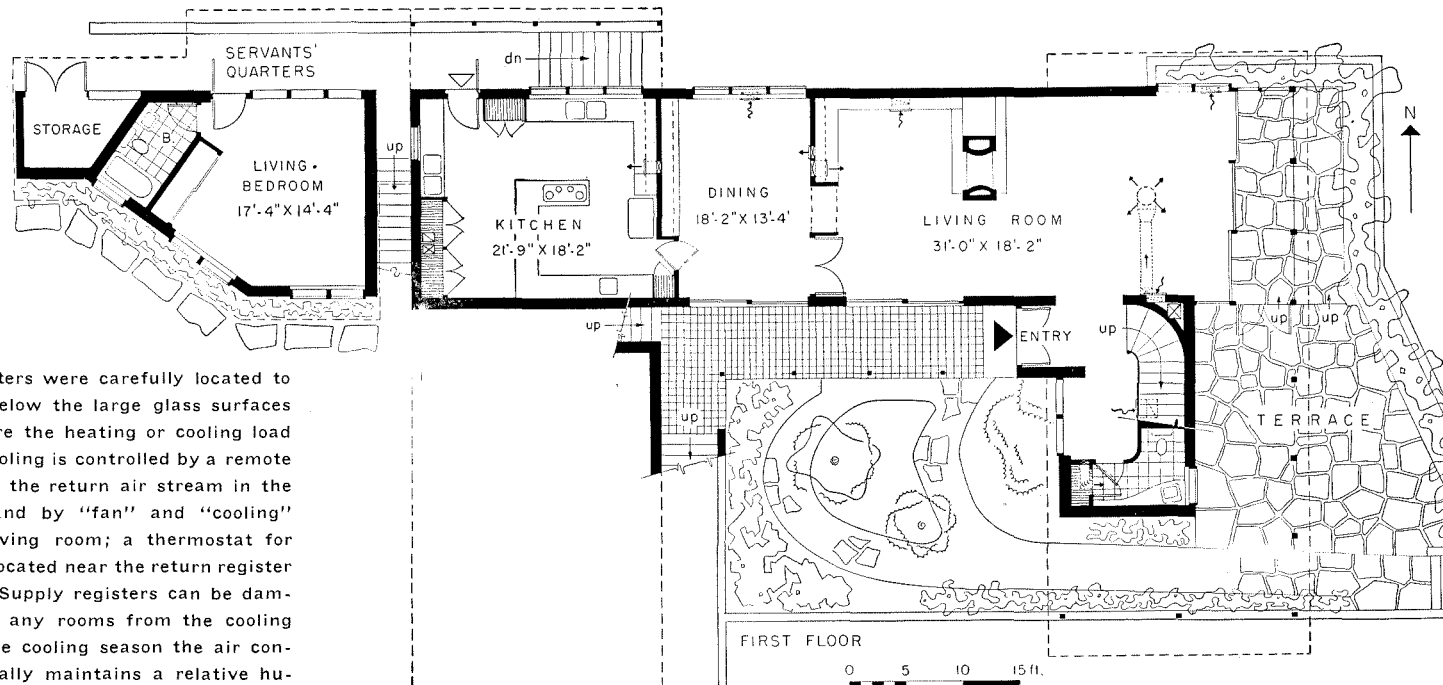
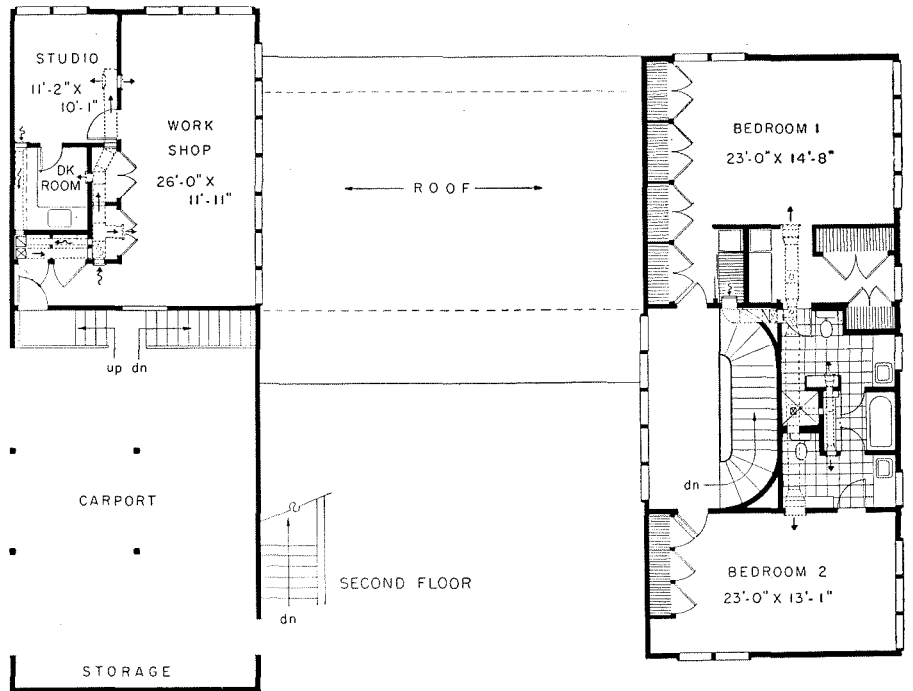




Carport, and workshop (blank wall at left), were placed on west side of plan, given sun-reflecting roof. Servants quarters are separate on a lower level at the left.

Air conditioning system (see floor plans)

Year-round air conditioning for the whole house is provided by a 7½ ton self-contained unit and a 250,000 Btu-per-hr. gas-fired winter air conditioner, both located in a basement equipment room. The cooling tower is an all-redwood forced-draft "Hideaway" tower, located on a slab under the house and discharging through a louver in the north wall.



Return air registers were carefully located to take in air from below the large glass surfaces in the house, where the heating or cooling load is the greatest. Cooling is controlled by a remote bulb thermostat in the return air stream in the equipment room and by "fan" and "cooling" switches in the living room; a thermostat for heating control is located near the return register in the stair hall. Supply registers can be dampered to eliminate any rooms from the cooling system. During the cooling season the air conditioner automatically maintains a relative humidity of not more than 55%.

To keep down heat transfer and noise, adequate insulation was used:

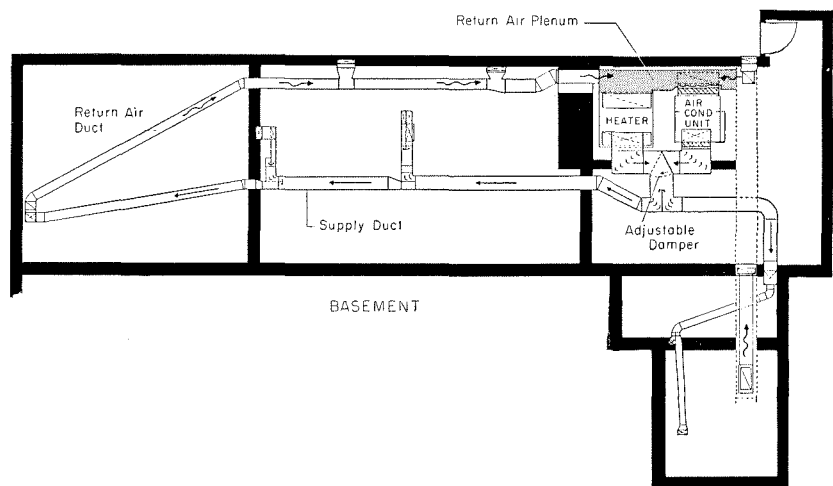
WALLS: Brick cavity walls have dead air space. Wood frame walls have aluminum foil insulation.

ROOF: A light-colored, sun-reflecting crushed stone over 5-ply built-up roofing over 2 x 6" decking 4" mineral wool batts underneath, and aluminum foil. (¾" glass fiber acoustical tile on ceilings helps reduce noise).

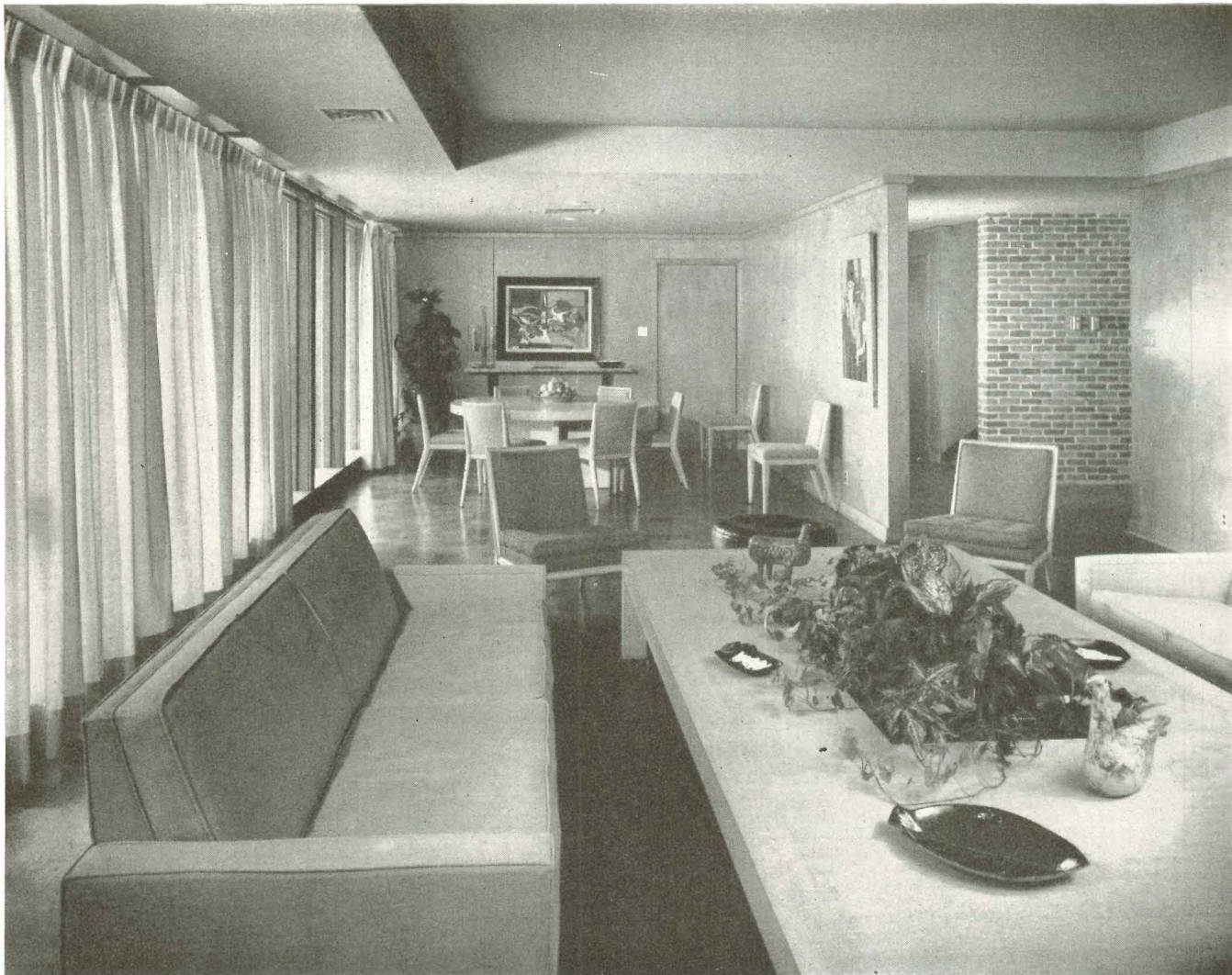
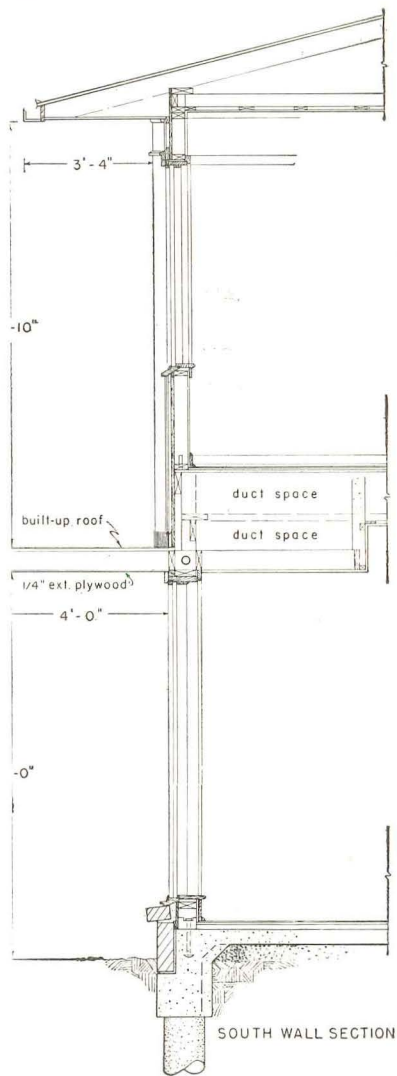
GROUND FLOOR: Fiber insulation board under plywood subfloors.

DUCTS: All ductwork is covered with 1" of glass fiber blanket insulation and vapor-sealed with aluminum foil.

COST DATA: The house, 5,039 sq. ft. of floor space (plus 2,400 sq. ft. of terraces, porches) was built for \$13 per sq. ft. including air conditioning. With 7½ tons of refrigeration used, this figures to 670 sq. ft. per ton of air conditioning, considerably more square footage per ton than the completely sealed Dallas house (p. 94).



DESIGN FOR AIR CONDITIONING



Dropped ceiling over living-dining areas carries ducts for both floors

2. THE SEALED HOUSE ignores nature's extremes,

creates its own climate year round

LOCATION: Dallas, Texas
 DE WITT & SWANK, Architects
 BOCK CONSTRUCTION CO., Contractors

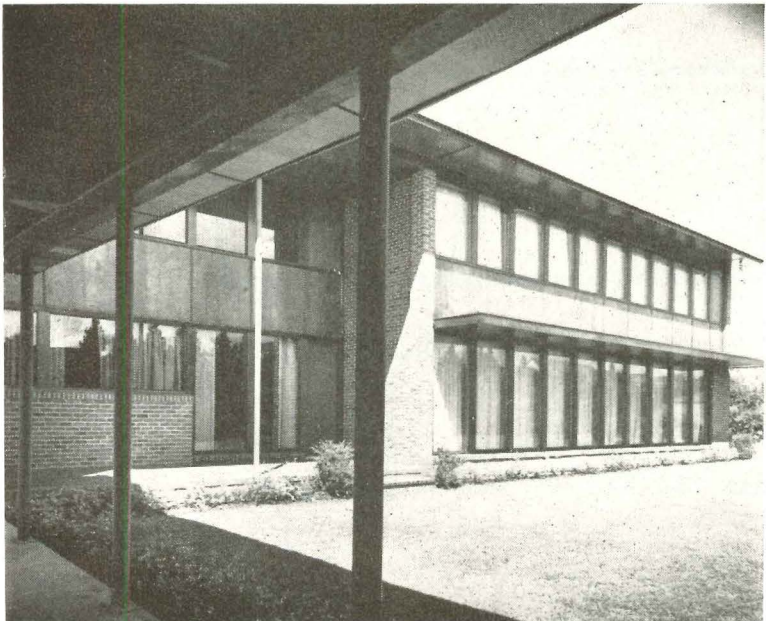
South windows have fixed double glazing, 3'-4' overhangs

The occupants of this \$100,000 house breathe conditioned, controlled, filtered air 365 days a year.

Built by the Carrier distributor in Dallas as a home for himself and as a showplace for his air conditioning equipment, the house is in effect a sealed box, entirely independent of the weather outside. The windows have become openings for light and view only; all of them are fixed glass set in putty. The only movable openings to the exterior are the four outside doors.

The design illustrates some of the possibilities that the growing field of residential air conditioning has introduced to the drawing board. The big factor of outside ventilation has been *dropped* from planning considerations. This means that architects and builders can put rooms where they want them, give their clients:

- ▶ *A more compact, economical floor plan*—it is not necessary to work out a rambling plan with wings, ells, breezeways, offsets, etc. to catch prevailing breezes. Thus total wall area can be reduced and the same square footage put into a squarish plan, saving the added cost of the extra walls.
- ▶ *Fewer orientation worries*—the house doesn't have to be turned, twisted and redrawn on its lot to take advantage of breezes. Site planning can be concentrated on the other factors of view, sun, privacy.
- ▶ *Bedrooms without cross ventilation*—two exposures, one of the first things most buyers and mortgage lenders insist on, are no longer absolutely necessary. In the future, architects and merchant builders



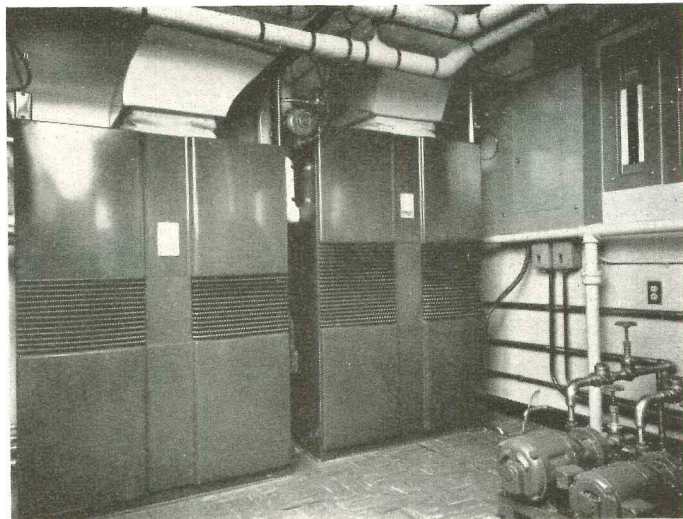
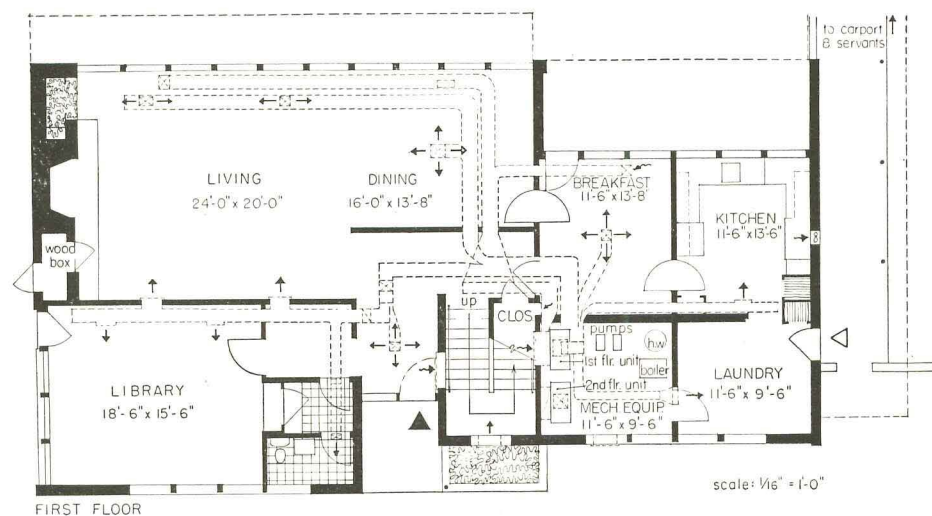
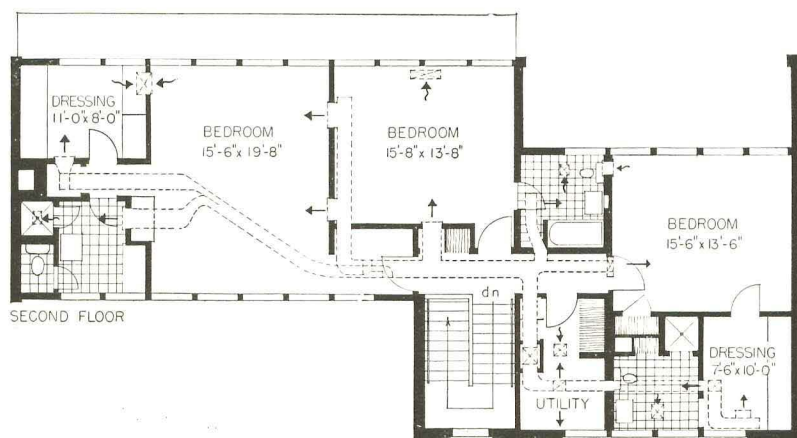
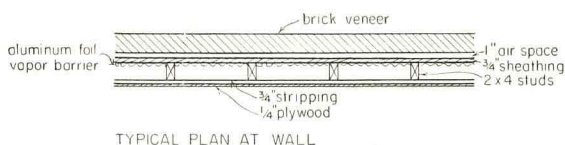
will be free to use blank walls or place bedrooms in line, saving the cost of windows and extra walls used when rooms are offset. Bedrooms no longer *have* to be on the southeast corner.

▶ *Cheaper windows, fewer of them*—with fixed glass replacing the normal double-hung casement or sliding sash on most of window areas, it is possible to reduce or completely eliminate movable sash, weather stripping, insect screens, storm windows and all the more costly equipment connected with conventional fenestration. (Note on winter heating: comparing his bills with his neighbor's, the owner of this Dallas house figures fixed double glazing saves him \$20 a month on his winter gas bills.)

▶ *Heating and cooling in one package*—with some air conditioning units, there is no need for separate furnace or heating ducts. Separate dehumidifiers, attic blower fans, etc. are not necessary.

▶ *Inside baths*—baths can be relegated to the interior, air conditioned and vented with exhaust fans, leaving the more desirable perimeter of the house free for living and sleeping areas.

▶ *Owner comforts*—in addition to year round filtered air at comfortable temperature and humidity, owners can have *lower cleaning and repainting bills* for interior walls and household fabrics, and a *quieter house*, sealed off from street noises and other disturbances.



Ground floor machine room: separate 5- and 3-ton cooling units and water pumps for each floor.

AIR CONDITIONING SYSTEM (see floor plans): Both the 5-ton unit for the first floor and the 3-ton unit are self-contained with their own hot-water coils and spray-type humidifiers. (Hot water for winter heating, and for summer reheating to secure relative humidity control, is supplied by a separate 80,000 Btu boiler a few feet away.)

Each unit is linked to its own condenser water pump which circulates water at 83° F. into the unit, out at 93° to a two-circuit cooling tower 60' away near carport-servants' building, and back into the unit at 83°. A low evaporative loss of 1 gal. per min. adds only \$4-\$5 to the monthly water bill.

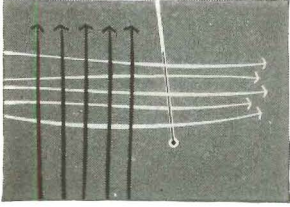
At night the first floor unit is closed down and the second floor unit, with its independent systems of supply and return ducts, is used exclusively to cool the bedrooms.

To keep down heat transfer, noise, and operating costs the architects insulated heavily in: **WALLS:** A five-thickness outside wall, including 1" of dead air space between wood frame and brick veneer, aluminum reflective paper between the studs (see detail sketch). **ROOF:** 4" mineral wool batts.

DUCTS: Galvanized steel supply ducts in the second floor ceiling were wrapped in 1" corkboard to prevent condensation and heat transfer from the warm attic. All supply ducts were lined inside with latex-coated glass fiber to prevent the mechanical noise of the 5- and 3-ton units from being distributed along with the cool air to all parts of the house. To insure quiet, the units themselves were mounted on 1/2" corkboard mats and linked to their supply ducts with vibration-absorbing canvas connectors (see photo). **WINDOWS:** Fixed double glazing with dead air space between the panes keeps the house slightly cooler in summer, definitely warmer in winter. The owner figures that without this type of window, his heating-air conditioning plant would have to be twice its present size and capacity. **COST DATA:** the whole air conditioning plant including ductwork came to approximately \$1,000 per ton, or a total of \$8,000. With some 3,840 sq. ft. of floor space in the house, this meant 1 ton of air conditioning for each 480 sq. ft.

Operating the system boosts the house electricity bills \$50 per mo. in summer:

	Winter	Summer
Electricity	\$28 per mo.	\$78 per mo.
Gas	\$18 per mo.	\$ 8 per mo.



air conditioning

Merchant builder survey

IN THE NORTHEAST: Great activity in air conditioning

Next to Texas, one of the most active markets for residential air conditioning this spring has been in the area around New York City. No one could say that Stamford, Conn., Westchester County, suburban Long Island and northern New Jersey have particularly bad summer climates. If builders this far north are beginning to think about air conditioning, the trend has significance for builders everywhere in the USA.

About ten builders are either installing air conditioning now or have gone far enough to make commitments with manufacturers. In addition, there are numerous builders who are on the verge of ordering air conditioning. One national manufacturer reports his dealers have 50 prospects who are genuinely interested.

Failures and successes in LONG ISLAND

Just to keep the record straight, it may be well to report the failures first. Last year, builder HOWARD BELL of Delworth Homes, of Long Island put up an air conditioned model and announced he would install a 1-ton cooling system in his \$12,000 houses for \$750 extra. He thought he had quite a sales attraction. In the months that followed he couldn't sell a single house with air conditioning. As a further slap to his pride, he couldn't even sell the model house until he removed the air conditioner. Air conditioning was clearly and pointedly an extra that his buyers didn't want.

This spring Castle Builders, a successful firm building in Babylon, opened a new group of houses at \$19,500 and up. Also offered was a larger split-level model with year round air conditioning at \$32,000. In the first four weeks, no buyers had turned up. One explanation was that it cost at least \$10,000 more than any other house in the neighborhood. Another is that no advertising was done. In either case, a more realistic test of air conditioning would have been to put it as an extra in the \$19,000 houses which were selling well.

DAVID STEIN is just putting a new group of \$12,990 houses on the market in Merrick, Long Island in which he will install a 2-ton cooling unit for \$750. His air conditioning contractor has not bought an as-

sembled unit but has purchased compressor, condenser, coils and other major parts from various sources and has assembled them. He is using an air cooled condenser.

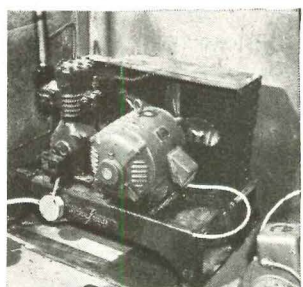
Stein says, "I think air conditioning is as sure to come as night follows day. It's going to be the thing to have. I want to be the first in my price class to have it. Maybe I'll put it in houses at \$10,500."

Air conditioning equipment dealers on Long Island are optimistic over the future market. Everyone has half a dozen or more hot prospects who will be signing up in the next few months. Dealers believe that the entire market is turning in their favor and when Regulation X is lifted, there will be plenty of families who want houses in the \$14,000 to \$18,000 market who can afford air conditioning. One dealer says he is about to sign a builder for 50 houses in the \$12,000 price.

In Cutler & Greenspan's 133 house project at Merrick, a buyer of a \$24,000 house can have 3 tons of air conditioning for an extra \$1,100. In the first month the project was opened last spring 12 houses were sold and of these, nine buyers bought air conditioning.

If Regulation X is removed, the sales department believes it can sell the entire 133 houses in two week ends and that 50% of the buyers will want air conditioning.

Platnick Photos



Above: Stein's house on Long Island. Below it: air cooled compressor. Hot air exhausts to the outdoors through ducts which were added later.

WESTCHESTER, air conditioned at a price

In Westchester County builder CHARLES NEWBERGH is well satisfied over the success that air conditioning has brought to the first of his 75 houses at \$40,000 up. This is the first group of air conditioned houses in the county. The 3-ton air conditioning unit is optional, but in the first nine houses (seven at over \$50,000) he sold in the opening three weeks, all buyers were willing to pay from \$1,800 to \$2,000 extra for it. Newbergh says that nine sales in that price class in three weeks is eminently satisfactory and he has "a hundred live prospects who are even better than the people I've already sold." He uses a Carrier unit.

When asked if air conditioning helped to sell his houses he replied, "I know very definitely that it has. I'm not here to push air conditioning, but I know from what the people have said that it has been important. It does represent an advance—something new. Any house without it will be obsolete in five years."

GREENWICH and STAMFORD also in the luxury class

In Greenwich, Conn. the Hvass Construction Co. started work last month on 66 air conditioned houses that will sell for \$26,000. Equipped with 3-ton year round equipment, this installation is one of the largest of its kind in the Northeast. Gas air conditioning is installed in all houses and is not an optional "extra." Houses have three bedrooms, two baths and a basement playroom, contain about 2,100 sq. ft. in addition to an expansion attic. BALDWIN HVASS, head of the firm, formerly built houses at around \$50,000, but has just moved into the new market. He estimates his year round heating and cooling cost about \$3,000 installed.

Builder CAREY WELLINGTON has used more imagination in merchandising year round air conditioning than almost any other builder. In developing his new \$40,000-\$60,000 Wellington Park houses in the wooded country near Stamford he realized in that climate he had to sell his customers more than summer cooling. The fact that New Yorkers think of Connecticut as a cool spot in summer would put selling summer cooling almost in the class with selling electric fans to Eskimos.

But Wellington is a man of imagination. He sells year round clean air: less dust, less dirt. He sells better health: fewer colds, less pollen, less hay fever, less allergies. He sells health in a big way and to

give his buyers something extra he installs an ultra-violet antiseptic lamp in his return duct which he says "purifies the air—as in all hospital operating rooms." He also sells less odors—and he backs up that claim by using a deodorizer lamp in the return system. He sold one house to a customer whose wife had hay fever and he knows air conditioning has brought him several other buyers. Wellington's most famous buyer has been Ezio Pinza, who bought a \$58,000 house partly because of its location but largely because he decided the air conditioning would be better for his throat.

Wellington uses two sets of filters and promotes that idea as part of his sales talk. He tells women their rugs will last longer and that there will be far less cleaning to do. He talks up the benefits of dehumidification, saying that window curtains won't sag in damp weather, that clothing hanging in closets will stay pressed longer. To dramatize the fact that he has year round conditioning and that the summer operation is different from winter, he installs two MHW thermostats and two humidostats and labels one pair "summer" and the other "winter." To parents of small children, he says his customers have already found that children have fewer colds because of proper winter humidification. In short, here is a builder who realizes that he has a real sales tool and that there are many plus values in air conditioning besides cooling.

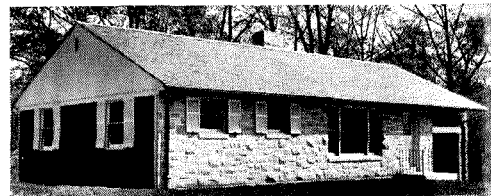
In his new project he has completed nine houses, has space for 55. He installs a 3-ton unit and divides his houses into two zones for cooling. As he does not have city water, he has to sink a well for each house and he uses well water (throwing it away afterwards) to cool his condenser. He estimates that the cooling unit, the larger ducts and the larger fan cost him \$1,800 more installed than if he put in only heating.

He is a great believer in the value of insulation. He puts 4" of loose bats on the attic floor and uses aluminum foil on the top side of his ceilings. Under the shingles or wood siding of his walls he uses an insulation board, adds 2" of mineral wool insulation in the stud space and an insulating plaster. To his customers he talks of "triple insulation" and claims they will save enough fuel in winter to pay for the summer air conditioning. He uses double glazing throughout.

He conducted a highly interesting experiment last year in a group of \$12,000 houses. He offered a 1-ton, two-zone system for

\$1,000. He sold 52 houses but not a single air conditioner. No one would pay that much extra.

Last year in New Haven, Conn. FRANK RABINO & SONS offered 3-ton gas air conditioning units as optional equipment in their \$23,000-\$24,000 houses at around \$2,000 more than heating. Eight of 14 families took the air conditioning.



One of several models built by Frank Rabino & Sons of New Haven, Conn.

Experiments in NEW JERSEY

In West Orange, N. J., builder ED SCHWARTZ is carrying on an experiment in low cost air conditioning which should be watched closely by other builders. In his \$16,300 to \$19,200 houses he adds a 1-ton unit for \$450 extra. Of the 45 houses built or under construction he has sold 39. All but one buyer wanted the air conditioning. Houses are from 1,100 to 1,220 sq. ft.

"Since air conditioning was offered me for only \$450, I went for it" says Schwartz. "It's worth \$450 as a sales feature. I can't say it is the one thing that is selling my houses, as I have a lot of other good sales points. But obviously, people will pay that much for it."

The air conditioning unit is of highboy shape, and sits beside a gas-fired warm air furnace. The cooling unit is hooked into the duct system through a plenum just above the heater. Larger ducts were not added to take care of cooling. Families who used the equipment last summer say it does "only a fair job" of cooling. When the outside temperature was 90° it was possible to reduce inside temperature to 80°. By closing bedroom registers during the day the living portion of the house is cooled, and at night the reverse is done. In particularly humid weather the unit takes 2 hrs. to become effective but in normal summer weather it takes hold more quickly.

Electrical operating costs are very low. One family reported a bill of only \$7.60 for July and August, which included electric lights but no heating, as the kitchen has a gas stove. Water bills are not known

BUILDER SURVEY

yet as water meters were not connected during the past summer.

Most recent New Jersey builder to use air conditioning is JAMES D'AGOSTINO of Teaneck who is erecting 100 houses selling for \$22,000 to \$29,000. He is using 2-ton equipment with a matched GE gas-fired furnace of 125,000 Btu capacity. His houses



Operational costs for D'Agostino's air conditioning are \$60 to \$80 for four months.

have 1,600 sq. ft. (see photo) plus garage and basement, where the cooling and heating equipment is located.

B. J. BERGTON, sales agent for the project, thinks that the widespread use of air conditioning in office buildings makes people want the same comfort at home. "In five years," Bergton said, "air conditioning will be just as important to the luxury house as insulation is today. It means less dusting, less irritating pollen and also less air-borne sickness. Put all these together and you have a potent sales argument that will cause people to demand air conditioning as a means of adding a value and enjoyment to their homes."

The development has just opened and it is too early to report how sales are going.

HARRY RAPPAPORT, air conditioning sales manager at a Newark, N. J. firm, says he

has six builder prospects who are hot and two who "are very very hot. We are sure of getting this business." He is confident in the near future he will sell some 200 to 300 units. One group will be in the \$24,000 to \$27,000 class, another around \$20,000 and a third at \$18,000. He says the total cooling and heating of these houses will run around \$2,500, of which from \$1,000 to \$1,200 will be for the cooling.

Builder LEO ROUGHGARDEN has done half a dozen air conditioned houses at over \$25,000 for custom buyers at Fairlawn, N. J. As word spreads throughout an area that the higher priced houses have air conditioning, builders are more anxious to include it in their projects.

PHILADELPHIA reports air conditioning makes sales

Builder MAX CHIPIN has air conditioned more than 60 houses in the \$17,000-\$24,000 class in Philadelphia. "It was very successful," he reports, "and we'd put them in all our houses if the cost of labor and materials weren't so high. We know now that central cooling systems, like television, are no longer luxuries. They're on their way to becoming necessities."

Chipin added a 2-ton cooling unit for an extra \$1,500 to his 2,000 sq. ft. houses. The system was not zoned but buyers were told to shut off bedroom dampers in the daytime. The equipment has been popular with his customers for the past two years. "We wanted something no one else had," says the builder, "and we found this was a real sales inducement."

Another Philadelphia firm, LUPOWITZ &

SONS, is now putting air conditioning in 31 houses that sell for around \$24,000. The firm's reason for adding summer cooling: "Other builders are doing it." The cooling equipment costs about \$1,500 extra. An unusual feature of the design is that winter air moves one way through the ducts and summer air the other way. Thus the winter supply ducts become the summer return ducts. (A diagram is shown on page 000.)

Builder MORTON DRATCH used a 3-ton unit in his \$15,500 houses, the cooling being optional at \$1,200 extra. Dratch is enthusiastic about cooling as a sales magnet: as word of it got round, hundreds of prospects came to see his model house. In the first 42 houses he built, however, only eight families wanted air conditioning. After more than two years of use, Dratch says the equipment is working even better than the manufacturer promised.

The only Philadelphia builder unhappy over his experience with air conditioning is CARL METZ. He planned to air condition 62 houses at around \$20,000. But his first buyer claimed the houses couldn't be heated in winter or cooled in summer. The builder blamed the equipment, the dealer said the fault lay with inadequate construction. In any case, only 13 houses were air conditioned and Metz "wouldn't touch it again with a ten-foot pole."

A new group of 68 houses at \$12,000 is just now being signed up by one of Philadelphia's large air conditioning dealers. The builder's name will not be released until the order is signed, but when these houses are started they will compose the largest air conditioned group in that area.

MIDDLE WEST

"We're coming to it in CINCINNATI"

In Cincinnati builder ROBERT WACHENDORF is a one-man exponent of residential air conditioning. He has installed central equipment in 18 houses. True he builds in a range between \$35,000 and \$55,000 that bears little relationship to the mass market. But experience in the Southwest has shown that when ideas get started in the luxury field they are often taken up by merchant builders in lower priced houses. In the next five years Wachendorf expects to build 75 more air conditioned houses. "It's a luxury now, but it's coming to cheaper homes," he is sure.

ARTHUR RADTKE, an air conditioning dealer, says without qualification: "Air

conditioning for houses is going to be a terrific business. Within five years it will take such a hold that even lower cost homes won't be complete without central cooling systems. Cincinnati is right square in the pollen belt. I don't think it will be much trouble to convince people that for \$600 to \$1,000 more than they'd pay otherwise they can get cooling as well as heating out of their central system."

KANSAS CITY factory-built houses with air conditioning

In Kansas City there have been many installations in the larger houses. While no speculative builder has used air conditioning, the building industry feels it is just

around the corner. "There is nothing wrong with air conditioning in Kansas City that a good hot summer won't cure," said CLYDE NICHOLS, a Chrysler distributor. "Four or five cool summers have made people forget how hot it can get here."

Wadsworth Homes, assemblers of factory-built houses, is beginning an experiment this summer that will be watched carefully. The firm has teamed up with Carrier to offer air conditioned houses to builders. Both BRUCE and L. D. WADSWORTH installed year round air conditioning in their own new houses last fall and liked the equipment so well they decided to offer air conditioned houses as part of their line. A builder buying any of their many models can now include air conditioning, bought

C. L. Wilborn



This large air conditioned house is a regular part of the Wadsworth factory-built line.

and installed through his local dealers.

Three exhibition models, advertised as "Wadsworth Weathermaker Homes," are being built in Kansas City this summer.

WICHITA finds low cost of heating hurts air conditioning

The cause of air conditioning has been hurt in Wichita because there are so many sheet-

metal shops that builders get low prices. "Heating costs from 20 to 50% less than in other cities," said KEN STOWELL, current local president of NAHB. The big market here is between \$8,500 and \$12,000, with most at \$10,000. People are used to getting their heating so cheap that the whole heating and cooling equipment would have to be at \$1,000 or less in this price range."

Not much cooling in DES MOINES, MINNEAPOLIS and CHICAGO

In Des Moines there are probably less than 15 houses with a central cooling system. WALTER GILBERT, a leading builder of expensive houses said, "If we should have a hot summer, there will be a lot of immediate interest in central cooling systems."

Most of the interest, he thought, would be in a unit that could be attached to the furnace for around \$1,000. However Gilbert does not expect cooling to be much of a factor in homebuilding.

In Minneapolis, two installation firms put in 14 central systems last year. But a lot of window coolers were bought. The weather gets hot, but hot spells don't last very long. One furnace man reported what holds down the sale of central cooling systems as (1) the weather and (2) the lack of any real sales effort.

In Chicago, no merchant builders have used air conditioning and it is rarely found in large houses. A spokesman for Park Forest said it "wouldn't be reasonable" to install air conditioning because "it would add too much to our costs."

IN THE SOUTH

CAMDEN, S. C. citizens are interested

Room coolers are being used in the huge Lynwood project outside Camden, S.C. A 1-ton console-type room cooler sits on the floor of a specially designed closet between two bedrooms. Cold air is blown through a high grille into each room.



Model house in the Lynwood project. It has a Remington cooling unit, about \$750 installed.

All models have about 1,000 sq. ft. of floor space, have three bedrooms on the ground floor, or two bedrooms there and one in the expansion attic with provision for a fourth. Houses sell at \$11,775. They have warm water radiant heat in the slab, provided by a compact York-Shipley boiler in the kitchen. A washing machine, electric stove and refrigerator are furnished. The houses, designed by New York architect IRVING M. FENICHEL, have not been on the market long enough so that the Atlantic Building Corp. can predict sales.

In RICHMOND, MEMPHIS, ATLANTA and MIAMI it remains to be seen

Builder MARK BANE in Richmond, Va. says, "Air conditioning may be the coming

thing," but neither he nor any other builder is putting such units in their present houses. Almost no existing houses have central cooling, although many have window coolers.

In Memphis the situation is about the same. Even luxury-house builders do not include central systems. The attic fan is counted on to do the cooling job.

Atlanta has about 800 apartment units that are air conditioned and an estimated 50 residences. There are thousands of Atlanta homes, including new ones costing over \$20,000, that have attic fans. But no one has pushed central cooling systems for private homes. Said ROY WARREN, merchant builder and real estate man, "Not a single builder I know of is putting cooling systems in. The costs are prohibitive; they are all out of line."

B. A. MARTIN, another leading merchant builder says: "I have considered it but I would not put it in a house for sale now. A lot of people might not like it. It makes a house a little more expensive."

Birmingham comes as a surprise to a census taker on air conditioning. No one knows how many houses have a central cooling system, but the best estimate is probably less than a dozen. Only two apartment buildings, Town House and Essex House, are centrally conditioned. Each has 136 units.

In Miami very few central cooling systems have been installed in residences or apartment houses. R. B. ROBERTS JR., vice president of the Florida Power and Light

Co., says, "They're few and far between and we have no record of them. There are thousands of room coolers in operation here. Nearly all of the newer hotels, apartments and commercial buildings are air conditioned but not homes."



Hundreds of apartment houses and hotels in Florida use built-in window coolers.

In LOUISIANA, a trend

Two power companies serving New Orleans report there are about 1,400 "central cooling units," both gas and electric, but this figure includes residences and apartments. The big ceiling fan is still the standby. Another power company that serves about two-thirds of all rural Louisiana reports it has about 50 customers using a central electric cooling system and about 60 using a gas system. However, ROBERT NORMAN, partner in the Aurora Development Co., notes a trend towards having houses in the \$18,000 and up brackets built with facilities for future installation of central systems. "I think all of them will come to it sooner or later."

BUILDER SURVEY

Builder A. K. AMMEN in Alexandria, La. has just started building the first of 200 houses priced from \$8,000 to \$13,600. He puts a 1-ton conditioner in a two-bedroom house and a 2-ton model in three-bedroom houses. The air conditioning unit, placed in the closet between two bedrooms, has a damper to divert cooling to the living room. Wall heaters are installed which are com-

pletely separate from the cooling system.

The builder pays \$265 for the 1-ton unit but total installation cost runs to about \$500 for the single unit and \$950 for the two units. Estimated operating costs are \$17 per month during the warmest weather when the compressor would run 14 hours per day. Ammen says he wanted air conditioning to give him a sales ad-



York Corp.

Builders have found that an "Air Conditioned" sign helps to sell houses rapidly.

vantage over his competition. He is sure the units will work as he put seven in his own home. A local banker handling the financing believes the houses will sell faster than non-air conditioned houses.

THE SOUTHWEST

In west Texas, Dick Hughes leads the fight

No builder has fought more determinedly for air conditioning than Dick Hughes. At this magazine's recent round table he said: "For the past four years I have been personally exploring the possibility of building homes for the low income group with both winter and summer air conditioning.

"I talked to every air conditioning company with whom I have done business urging them to assist me. But I made very little progress.

"Last summer the heat was unusually intense in the Southwest and I renewed my efforts but I could find only one firm interested in my program until the first "Operation Trade Secrets" meeting. There I said: 'In five years—even the very small homes will be completely obsolete unless they have winter and summer air conditioning.' The trade magazines picked up the quotation and after that I began to make progress. We now have our first completely air conditioned unit in operation in a house which I will be able to sell for \$10,500.

"Homebuilders all over the Southwest contact me daily wanting to know what progress I am making on my air conditioning unit.

"My primary interest in air conditioning stems from four major facts:

1. It gets hot in west Texas.
2. The wind is constantly blowing and it carries a lot of dust.
3. Eighty-five per cent of all the carbon black of the world is manufactured in west Texas. As a result the air around the towns in which I build is constantly filled with smoke.
4. The doctors report an increasing amount of sinus trouble because of the dryness of the air.

"Air conditioning becomes essential if

we are going to provide small homes for comfortable living.

"Air conditioning will, according to physicians with whom I have talked, improve people's health by allowing them to live in and breathe air that has been properly humidified.

"I have talked to homebuilders in practically every part of this country—I have discussed the matter with the FHA and VA and it is my opinion that proper air conditioning is needed in the small homes

worse than any other item at this time. Builders and the public recognize that fact and FHA and VA officials are extremely anxious to co-operate.

"When I contacted FHA and VA they were intensely interested but it is obvious that people in the low-income group will not be able to pay large water bills. The successful small home unit must be manufactured so that water will not be wasted. The FHA's first objection was the fact that water bills in Texas would amount to \$25 to \$30 per month and therefore low income people could not qualify.

"The conservation of space is also important. The unit should be small and located in the center of the house to conserve ductwork.

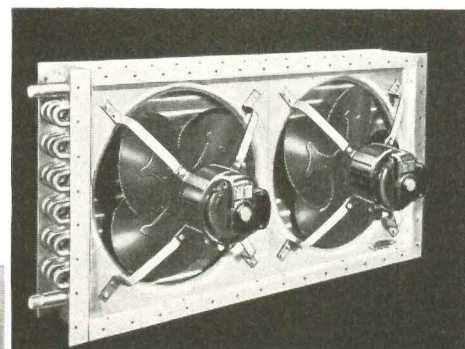
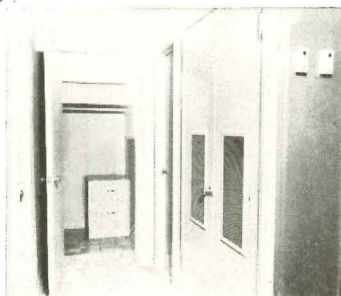
"The same ducts should carry both hot and cold air and the longest duct should be only 7' or 8'.

"This unit should be cheap enough so that the entire cost can be put in the mortgage and amortized at not more than \$10 per month. The operating cost must be lower than \$5 per month. When these items are accomplished air conditioning can and will be installed in the majority of the small homes of America."

The photo, at left below, shows one of the four air conditioned models Hughes is building now at his home base in Pampa.



Above is the first of four new air conditioned models Dick Hughes is putting on sale. Right: two doors lead to equipment room. Far right: air cooled condenser installed in the attic.



Hughes is putting up a group of about a dozen houses to serve as pilot models for a big future program.

His two-bedroom houses will sell for either \$10,500 or \$11,500 and the three-bedroom models for \$12,000 or \$13,000, depending on how much special equipment

they contain. Hughes estimates that heating and cooling of the three-bedroom models costs a total of \$1,500, including 3 tons of cooling and a 150,000 Btu heater. In the future two-bedroom houses he will use a 2-ton compressor.

To get away from the operational cost

of water, he is using an air cooled compressor located in the attic. Hughes is attacking the problem of operational costs with more aggressiveness than any other builder and what he discovers will be watched with great interest by both builders and manufacturers.

AUSTIN air conditioning is still a luxury

In Austin there are many air conditioned houses but nearly all are more than \$20,000. But Mr. H. E. CAMERON, an air conditioning dealer, says he is about to install some 3-ton units for two different builders in three-bedroom houses selling for around \$12,500. The houses will have a minimum of ductwork as the hall will be furred down for a plenum and short ducts will run into each room.

Cameron has made some interesting installations of an induced draft water tower in the garage, drawing air from the attic through the cooling tower. This lowers the temperature in the attic and raises the temperature of the pan water only $\frac{1}{2}^{\circ}$ as compared with using air not drawn through the attic. He hopes very soon to be able to supply a 3-ton unit to builders, installed with heating, for around \$1,500.

PHOENIX, TUCSON, ALBUQUERQUE and EL PASO are on the bandwagon

While Houston and Dallas may boast of the total number of air conditioned homes and business places, it might be that an actual count would show that for its size Phoe-

nix, Ariz. should win the national prize. Estimates are that 75% of the 42,200 dwelling units have some kind of duct cooling. About 30,000 houses have evaporative coolers; about 1,500 have refrigerated coolers, of which 800 were installed in the last two years. This year 400 or 500 will be installed. Based on past growth, within five years 800 to 1,000 central refrigerated units will be installed annually.

Local observers feel that most houses costing \$20,000 and over will have mechanical cooling systems, and that as soon as equipment prices go down, there will be a boom on in the less expensive house market. Many older houses are now being converted to refrigerated cooling. There is a water problem so when air cooled units are developed, they will increase the size of the market. It is highly significant that all houses built in Phoenix since the war have ducts installed for cooling. Even \$7,000 houses are prepared for an evaporative cooler, but the buyer always adds the cooler after he moves in.

In Tucson there are actually more coolers than there are houses. A. R. SEAMAN, Power Co. official, estimates there are 105% coolers—as many houses or business firms have more than one. Some stores or

churches may have eight to 12. In the past few years practically all new houses have had built-in duct systems for evaporative coolers. Mechanical cooling units are used primarily in business places.

Albuquerque is as high as Denver and most residential cooling needs are met by window units. The best estimate is that less than 5% of houses have a central cooling system and these are in houses of over \$25,000. Builders report a number of new houses in the \$15,000 and up class that have provisions for central cooling but installation is left to the future.

El Paso is high and dry and is an ideal climate for evaporative coolers. Virtually every home has one. It is easy to find the poorest kind of adobe shacks with evaporative coolers on the roofs. Probably less than 1% of houses have a central mechanical cooling system and these houses cost \$50,000 or more.

Joey Starr



Evaporative cooling units on the roof of a Phoenix house

IN THE WEST

CALIFORNIA is trading evaporative coolers for refrigeration

Visitors to the Golden West may have the feeling that the climate's fine—never too hot, never too cold. But it is a great place for air conditioning, anyway, judging by figures. Servel alone has 522 residential air conditioners in the greater Los Angeles territory, 190 more in San Francisco and nearly 500 in the rest of the state. With the natural gas rates low, Servel's gas burning equipment got the jump on other units.

A California firm making evaporative coolers, Utility Appliance Co., claims it is the country's largest and that it sells about 17,000 coolers yearly in Los Angeles county alone. The firm makes 35,000 to 40,000 an-

nually and officials estimate that about 750,000 evaporative coolers are in use west of the Rockies and in Texas.

One of the summer hot spots of the state is Fresno where nearly every house has home cooling. Builder BRUCE YOUNGER estimates that 95% of houses use evaporative units. Of the 100 houses he has built with summer cooling, only 10% were refrigerated units, for his more expensive houses. He believes this type is on the increase now because of the growing humidity due to irrigation. He reports that when he advertises "Cooled by refrigeration" his inquiries are doubled.

Builders TAYLOR & WHEELER of Fresno estimate they have installed at least 84

refrigeration units and more than 100 evaporative coolers in new residences in the past 15 years. The price range of houses with evaporative units is from \$7,000 to \$20,000, and from \$15,000 up with refrigeration units. They have used practically all makes of equipment, including a heat pump. People there don't have to be sold on air conditioning, they report.

In Sacramento's 80,000 homes it is estimated that less than 10% have evaporative coolers. There are about 300 central mechanical cooling systems. In the more expensive new houses there is a trend to central systems. Bakersfield, 200 miles further south, is like Fresno: really air conditioning minded.

What do builders want . . .



Photos: Roy Strovens

A round table discussion on residential air conditioning

P. I. Prentice:

Editor and Publisher, MAGAZINE OF BUILDING

We have invited you here today because we believe that residential air conditioning may well be something of tremendous importance and value to the volume homebuilders. We also believe the 20,000 volume homebuilders, who erected something like 83% of all the professionally built houses in the US, can be very important to the air conditioning industry.

If I may quote Manny Spiegel, who speaks with the authority of being first vice president of NAHB, "We all hope that air conditioning is going to be the next big thing in homebuilding, but it won't be unless a great many changes are made."

Some of those changes will have to be made by the manufacturers, who will certainly wish to study the volume builders' needs with an eye to fitting their product to what the builders want. But some of those changes are up to the builders and their architects, who must get a better understanding of what air conditioning can do for them and what they can do for air conditioning. And some of the changes must come in the thinking of the mortgage lenders.

This is the first time there has been a get-together like this between top factors in the manufacturing of air conditioning equipment, top financial people, designers, NAHB representatives and builders who have already put air conditioning into volume-built and quite low cost houses. You can learn from them firsthand what was good about it and what was bad about it, what came off right and what came off wrong, and profit by their experience.

Irwin Jalonack: Chief mechanical engineer of Levitt & Sons

A builder looking for a volume market has a basic problem. He has to have a house priced low enough so he can sell a lot of them, and he has to get as much possible appeal as he can into the house.

You have all seen the old sales triangle. Every time you raise the price of the house \$100 or \$500, you eliminate some prospective purchasers.

No one can dispute the fact that if you can air condition a house, it lends a great deal of appeal to it. What would the builder like? He would like to have the air conditioning, and he would like to get it for nothing.

Now, before somebody accuses me of undermining the basic economy of the country, I don't mean that we won't pay for it. We will pay the manufacturer for it, but let me highlight for a minute what I am talking about when I say the builder would like it for nothing.

We put full insulation in our house, and we use double-glazed windows. We consider this costs us zero because if we didn't do it, we would have to put that much money into the heating plant and the distribution system. So we have this insulation and the double glass, both highly desirable features, and they cost nothing.

We use a paint that by ordinary standards costs three times as much as what you would think. It is probably the most durable and washable paint that is made, a wonderful product, yet, because we apply it by spraying, and because we don't have to come back and use a separate paint to trim over the wood (as this covers wood, plaster, plasterboard and everything else) it doesn't cost us anything.

A few years ago, we were going to put in a laundry tray. When we figured the cost of the laundry tray, the additional cost of the cesspool, extra depth and plumbing involved, we found we could provide an automatic washer for nothing, so we did.

All these things are highly desirable. But air conditioning is the manufacturer's problem because the builder's desire to get this stuff is at zero cost to himself.

You have to put a heating plant into a building. It is conceivable that the air conditioning can be so combined with the heating plant that it costs nothing.

Well, we might be able to compromise. We might be able to pay a little more, \$10 or something. (Laughter.) To be big, we might raise it to \$11. But this business of \$1,000 is out.

There are other costs besides the cost of the equipment which the builder is faced with. There is the space problem. Space costs money. If any of



Representatives of the building and air conditioning industry were invited to New York City on April 10. A list of men attending is at the end of this article.

you have seen our houses in Levittown, you know that we don't have a utility room. As far as our heating plant is concerned, we dedicate a space in the kitchen that is 25" deep, 30" wide and 36" high. That is our heating plant. (For photo see page 120.)

The virtue of having the plant there is that you have the whole kitchen for accessibility to it. If you put it in a utility room, in addition to the space the equipment takes, you have to provide space for getting at it. This is more or less lost and wasted space, so you can't just lightly design an air conditioner and say the equipment has cost so much, and not remember that it cost the builder something to provide that room. While floor space is most important, even the height is of some value. In the case of this 36" high unit we use, the top of it is a work surface. It is a stainless steel top, and it is right near the stove and is used all the time.

The manufacturer has got to turn his wits to get this thing developed, so that he combines heating and cooling, so that the cost of the cooling equipment is the same or very, very little more than what the cost of the heating would have to be, and that is the goal. The goal is zero. I didn't ask that the combination be cheaper. (Laughter.) We are very conservative. We don't want to alarm you, but it has got to be close. It can't be \$400 or \$500 or \$600 above it.

This year we are selling some 4,000 or 5,000 houses. If our volume was 2,500 houses, everything else being the same, we actually would lose money; there isn't any question about it. We have to predicate our whole position on selling a lot.

Up to this time, no air conditioning manufacturer that I know of has seen that the hen came before the egg, so to speak. They have looked at what the market is, and then they have set their price accordingly. Nobody has been willing to say, "Well, we would sell this for about a third if we could get ten times the volume."

If you could put in an air conditioner in a house for no more cost, I think that anybody would take it. Nobody would say, "Just leave out the air conditioning because I don't like it; my cat is allergic to it." If it costs zero you have an unlimited horizon.

Well, you can't all have it, but whoever gets there first will get the market, and it will be a very profitable one.

That, briefly, is what we want. In other words, what does the builder want? The builder wants it for nothing. You asked me, and that is why I told you. (Laughter and applause.)

Harry Madway:

President of Home Builders Assn. of Philadelphia

As a builder, I think the air conditioning industry has a job to do in solving certain problems. They have to determine whether they can get away from a water cooled job and do the job properly air cooled. In many areas of the country, if you are compelled to use a water cooled air conditioning system, you are going to run into trouble where you have high-cost water or limited waste disposal facilities.

Most people are too ready to accept the idea that it is most economical to combine your heating and your cooling. It is conceivable that it might be a lot cheaper to keep them entirely separate. In the type of perimeter warm air heating system that we use, the cost of modifying it so that it will operate efficiently for cooling would make the whole system impractical. I think, too, you have to do some thinking about the kind of wiring load that you might be imposing. Many are wired for 110 v. current, and we have got to think of an inexpensive prewired system, too, if we are going to use air conditioning.

Mr. Jalonack raised the question of space. Perhaps in slab houses we can use the attic in some fashion, and then, you also have to consider the flat roof houses.

There seems to be room for an industry research program similar to that which resulted in the perimeter warm air system.

Emanuel Spiegel:

First vice president of NAHB

As builders, I wonder if we should be discussing details of the type of unit, or whether it should be air or water cooled.

I agree that there are many problems. I think that what it boils down to is that instead of building Cadillacs, you fellows in the industry are going to have to build Fords. I think somewhere in this room, one of these manufacturers is going to be the Henry Ford of the air conditioning industry, and when you get to the point where you have designed a unit at a price that we can afford, we will use it.

It will have to be as practical as the very devil, because, considering Mr. Jalonack's problem—and it is the same with all of us—space costs money, and every inch of space that we have to give up to an air conditioning unit, we are going to have to add to the cost of the house. Air conditioning is the next big step, and you fellows are going to have to do the research, you are going to have to dig up the method. You must be designing it and having a lot of research done in your own laboratories right now.

Builder Dick Hughes's remarks are on page 100.

... and manufacturers promise?

F. J. Van Poppelen:

General manager of Air Conditioning Dept., GE

There is no doubt that the lower the price, the more we will move. But I think we have another big job as manufacturers to do, and that is to create a demand. The public will spend money for expensive things like automobiles. People are perfectly willing to spend for something they think is necessary or good for their health and comfort. When we sell the idea to the homeowner that air conditioning is something more than a luxury, that it is a necessity, that it serves a real purpose, it will be easier for the builder to charge a little more for his house and sell it, too.



O. W. Bynum: Exec. vice president of Carrier

We certainly have a new objective on this "\$11 system" and I am going to go back home and work on it pretty hard. It is interesting that the consensus of this meeting is that we have a terrifically big market. I agree that an air conditioning market in residential work has been building up now over a period of some 15 to 20 years, and it is just beginning to snowball.

The point has been made that air conditioning is important besides the summer cooling. I think that summer cooling is merely the sensational side of air conditioning. We have a considerable job to do in educating people on the year round benefits. In my home, I get more benefit from air conditioning in the winter than I would get from summer cooling.

There is a possibility of doing residential air conditioning some damage if we are not careful about the applications and type of equipment we put in. If we don't get capacities and applications right, and if we don't provide for good service, we can kill the goose before it starts laying eggs. It has been the experience of most firms that they can be set back a long time unless the applications are properly made.



J. R. Hertzler: Vice president of York

Any remarks that I would make I would like to classify under two subjects. First, we can dream, can't we? Second, who is going to create the demand for residential air conditioning, year round air conditioning, that will make it a commodity?

Carl Boester has some ideas (see page 106) we can dream about. They stimulate our thinking.

Last week, I had the privilege of inspecting the new Armstrong Cork Co. Research Laboratory at Lancaster, which is a marvelous installation. I saw tests being conducted using insulation in such forms that you can eliminate the wall, and then a little further dreaming (and a little further thinking, takes the air conditioning engineer over into the field of dreaming) where we might like to conceive of an air conditioned outdoors which would permit of the elimination of a building, or possibly of all buildings.

Howard L. Spindler:

Director of public relations, American Radiator & Standard Sanitary

I think we have three parts to this problem. First there must be a product, then a market, and then you have to finance it.

When it comes to marketing, our problem is one of education, and that will be the job of the manufacturer, in conjunction with the publishers, in order to get that story to the people of our industry. The manufacturer will have to make that product to fit the home. He cannot expect the builder to build a home around our product.

This meeting has stimulated the thinking of all of us. We have got to do a lot of work at the manufacturing end before we can start the educational thing. I think there is a present demand, and I think that demand is bound to grow, regardless of any promotion on education. But we have got to have the product first and be sure that it is going to fit the builder's home.

James N. Crawford:

Vice president of Bryant

The advantages of summer air conditioning need to be appreciated by the public. Even in this colder climate there are many advantages of summer air conditioning which we have not sold, and by "we" I mean the industry.

Sometimes I think we get so enamored with the subject ourselves that we forget that we have to sell it to the public. All of us have got to really roll up our sleeves and sell this idea of summer air conditioning and what it will do for the public before we can make a success of this business.

Jack Kice: of Coleman

This month we begin deliveries of our first production model cooling units in 2- and 3-ton sizes to fit the residential market we have been discussing today.

Our entry into this field was predicated on the same analysis that prompted this meeting. . . . Air conditioning is growing up! It is now ready—or almost—to make its bid for the mass market—that magic situation that is so much responsible for the many wonderful things in America.

I'm sure that everyone here recognizes the problems in consumer education, product design, financing and all the others that must be handled as we steer air conditioning into the homes of America.



J. A. Gilbreath:

Ass't. vice president of Air Conditioning Div., Servel

Installation and maintenance must be well done.

From a manufacturer's viewpoint, I know that residential air conditioning can be damaged a great deal unless it is carefully handled and applications are properly made and good service is provided. The manufacturers today, as a group, are work-

ing diligently in the direction of *lowering* the cost of equipment to the practical minimum consistent with good business practice.

The matter of establishing air conditioning values in the minds of the people who buy and occupy these homes is the most important job that we collectively have. It has been mentioned by practically everybody here, but the values of air conditioning are such that when they are known and understood, they justify some additional costs in a residence.



A. B. Newton: *Vice president of Acme*

People do not yet know what residential air conditioning is. That is a No. 1 problem, as well as financing. In most cases when it came to selling those houses, the general public had no conception of what air conditioning could do for them. That is a problem that everybody in the industry ought to tackle, builders and manufacturers alike.

We have a lot of educating to do in getting people to know how to live in an air conditioned house.

When my family first air conditioned our house, they had to open the windows every night. Eventually we kept our windows closed and our storm sash on all summer as well as all winter, and never put the screens on.

Three or four years ago, we moved to Jackson, Mich. where we are now. We went through one of the two summers during that period when we did not have air conditioning. The things that the family complained about I think were important and different.

I think of air conditioning with comfort and health as the important things. But those were not the important things to my wife. She objected to the fact that we had no air conditioning from the point of view of noise and dirt in the house; the fact that she had to open windows to keep cool was now an objection instead of something she had to do.

People just don't realize the unexpected advantages of air conditioning as well as comfort. So perhaps the thing we are talking about, such as leaving off screens, is coming in the future, but we have got to do a lot of educating before we get there.

George Boeddener:

Managing director of National Warm Air Heating & Air Conditioning Assn.

It has been suggested that some research ought to be done on summer cooling tied in with year round research that has been done on warm air heating. I am glad to tell you that we have a research program on summer cooling which is about ready to go on. The equipment is already installed in a research house at the University of Illinois, and we will have a report this fall. In addition to that, we have our Mobile Field Laboratory which has made several investigations of houses that are equipped for year round air conditioning. They have made tests out in the field on heating and this summer we are going to make tests on the cooling. We hope some day soon to give you a report.

Harry Steidle:

Secretary of Prefabricated Home Mfrs. Institute

I am neither an engineer nor a homebuilder, but I am a secretary of the Prefabricated Home Mfrs. Institute. It has been the aim of prefabricators to deliver a house that is complete in all details. We have come up against many hazards, and we have not yet accomplished that aim but we are working well in that direction.

The emphasis today on volume-building ties in with the job of the prefabricator. He is the man who is doing it, and he started in the low cost field.

The trend now, as you will notice from the advertising in the pages of both editions of THE MAGAZINE OF BUILDING, is toward higher priced, better designed, and more completely engineered houses, all of which makes me believe that if you gentlemen can get air conditioning down in price, the prefabricator would be the ideal man through whom you could work.

Several firms are making houses that sell for \$25,000 and \$30,000. I am sure that air conditioning would be a welcome addition to those units.

Lawrence Wadsworth:

President of Wadsworth Homes

We are comparatively small manufacturers of houses in Kansas City, but we are believers in the market for air conditioning. In fact, we have been associated with Carrier in their promotion. We are now showing air conditioned houses in our line, the Weather Master House. We have designed and will ship to our builders in Kansas City three different models of air conditioned homes for display purposes, to be available early this summer.

Housing Consultant Carl Boester suggests wall coolers

I suggest that you reconsider the application of the room cooler to the problems of the homebuilder. I am thinking about the problems of air conditioning for the small home on the premise that the room cooler, as a device, is a good one—a good solution that technically and physically is acceptable.

Instead of tearing up the pea-patch by hanging your unit in the window and making it hard to get at in a lot of other ways, why not take the cavity of the wall as the space to do it?

If I were in your position, particularly with materials shortages, I would start out with a component part of the homebuilders' construction, the wall, and use that as a case for my equipment, constructed not out of metal but of wood.

I would take the same component parts that you have in your room cooler—your compressor, your evaporator, your condenser, your restrictor tube, or expansion valve, and the other little things that go with it—and just rearrange them to fit in the stud space.

I would provide the builder not with a metal cabinet but a wood container which becomes his wall. The 2 x 4" frame which you assemble your equipment into goes to him and he just sets it in line with the wall.

Then I take one space which is, roughly, 16" x 8', and add a little propeller fan at the top that blows the air out in the room. Down at the



Carl Boester: *continued*

bottom I would put an opening with a grille in it, and then I would put my evaporator coil next to it. On the outside wall I would cut a hole for my propeller fan, put my condenser coil below, and cut a grille so that the air from the outside comes through the cavity space, through the blower and out, so I accomplish my condensing function.

Then I would go a step further. We are talking about the heat pump. I would use a pair of three-way valves, so that in the early spring and early fall you could reverse the cycle and make it an air-to-air heat pump.

Here in effect you have the basic element for heating and cooling right in the stud space. You are not requiring the builder to take any additional space. There are several electric resistance heating panels on the market. You could put booster heaters suspended from the ceiling controlled by thermostats, and apply the electric resistance heating on severe days to make up the difference on this heat pump cycle.

In addition to that, on winter heating, you can steal a page from Dr. Mills in Cincinnati and line the walls of your house so they have certain reflective aspects to them, so you reduce your heating load there.

When I came into the room I would turn on the heaters and when I left, I would cut them off.

It is my computation that the annual electric heating and cooling bill would be less than it would be on a combination of oil or gas, and with separate refrigeration for summer cooling.

This is all predicated on the assumption that you as businessmen take the position that the room cooler is a good idea. It is simply a suggestion. You may need to investigate the patent situation, because that is involved.

This combination of the air-to-air heat pump cycle, plus some resistance heating boosting, will mean that your first cost will be considerably less than what builders are now paying for air conditioning.

It is all self-contained. When the electrician is running his service line he provides for power requirement and controls. You have no water consumption or anything else. It seems to me it is not an item, as far as the homebuilder is concerned, that needs to go through the appliance dealer. It could go direct to the homebuilder, and there is nothing to keep the homebuilders from assembling units like this from parts that you manufacture. After all, we have wall furnaces; why not wall cooling?

Subsequent to this round table and the challenge by some round table members, Carl Boester has built and now is testing such a unit as he proposed, with plans for limited availability of such units to homebuilders this year.

At the round table conference

Manufacturers

Acme

A. B. Newton

Airtemp

M. T. Bard

American Radiator & Standard Sanitary

Joseph Grazier, Howard L. Spindler, William Cooper

Brunner

F. C. Hawk

Bryant

James N. Crawford, R. T. Killian

Carrier

William Bynum, J. M. Bickel, William Lake, A. E. Meling, S. F. Shawhan

Coleman

Jack Kice

Fedders—Quigan

Frank Mitchell

Frigidaire

Wendell Smith

General Electric

F. J. Van Poppelen, H. M. Brundage, Harold Donley, S. J. Levine

Majestic

George Boetinger

Philco

W. H. Eichelberger, John Cherry

Radio Corp. of America

William Carolan, Sam Conley

Remington

Fred Stidfole

Servel

J. A. Gilbreath

Westinghouse

J. C. Thompson, T. E. Smith

Williams Div. Eureka Williams

C. S. Stackpole, Andrew F. Ward

Worthington Pump & Machinery

M. M. Lawler, Charles Butcher, John Larramy

York

J. R. Hertzler, C. A. Barnes

Associations

American Gas

Carleton Wolf, managing director

Air Conditioning & Refrigeration Machinery

William Henderson, exec. vice president

Gas Appliance Manufacturers

Leigh Whitelaw, managing director

National Warm Air Heating & Air Conditioning

George Boeddener, Randall Nelson

Prefabricated Home Manufacturers' Institute

Harry Steidle, manager

Builders and Prefabricators

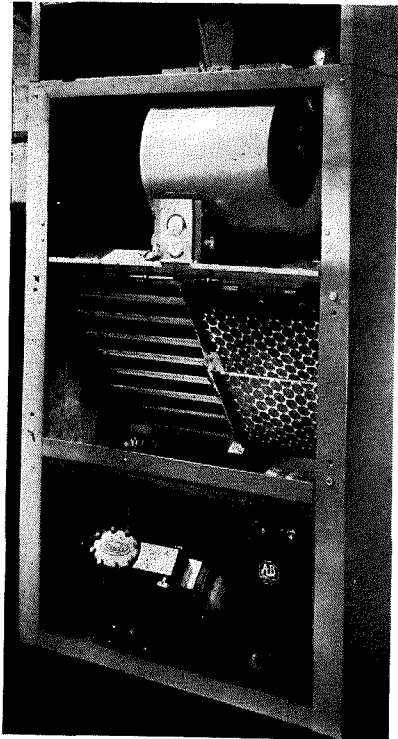
Emanuel Spiegel, first vice president, NAHB;
Richard Hughes, treas., NAHB;
Leonard Frank, exec. committee, NAHB;
Leonard Haeger, director of research, NAHB;
Lawrence Wadsworth, president, Wadsworth Homes Inc.;
Irwin Jalonack, chief mechanical engineer, Levitt & Sons;
Harry Madway, president, Home Builders Assn. of Philadelphia;

Mortgage lenders

Thomas E. Lovejoy, pres., Manhattan Life Insurance Co.;
Brown Whatley, first vice president, Mortgage Bankers of America, and president, Stockton, Whatley, Davin & Co., Jacksonville, Fla.;
M. K. M. Murphy, past president, US Savings & Loan League, Rutherford, N. J.;
John Austin, president, T. J. Bettes Mortgage Co., Houston, Tex.;
W. A. Clarke, president, Clarke Mortgage Co., Philadelphia, Pa.;
Allyn R. Cline, president, Cline Mortgage & Trust Co., Philadelphia, Pa.;
Warren Hill, asst. exec. vice president, N. J. Savings & Loan League

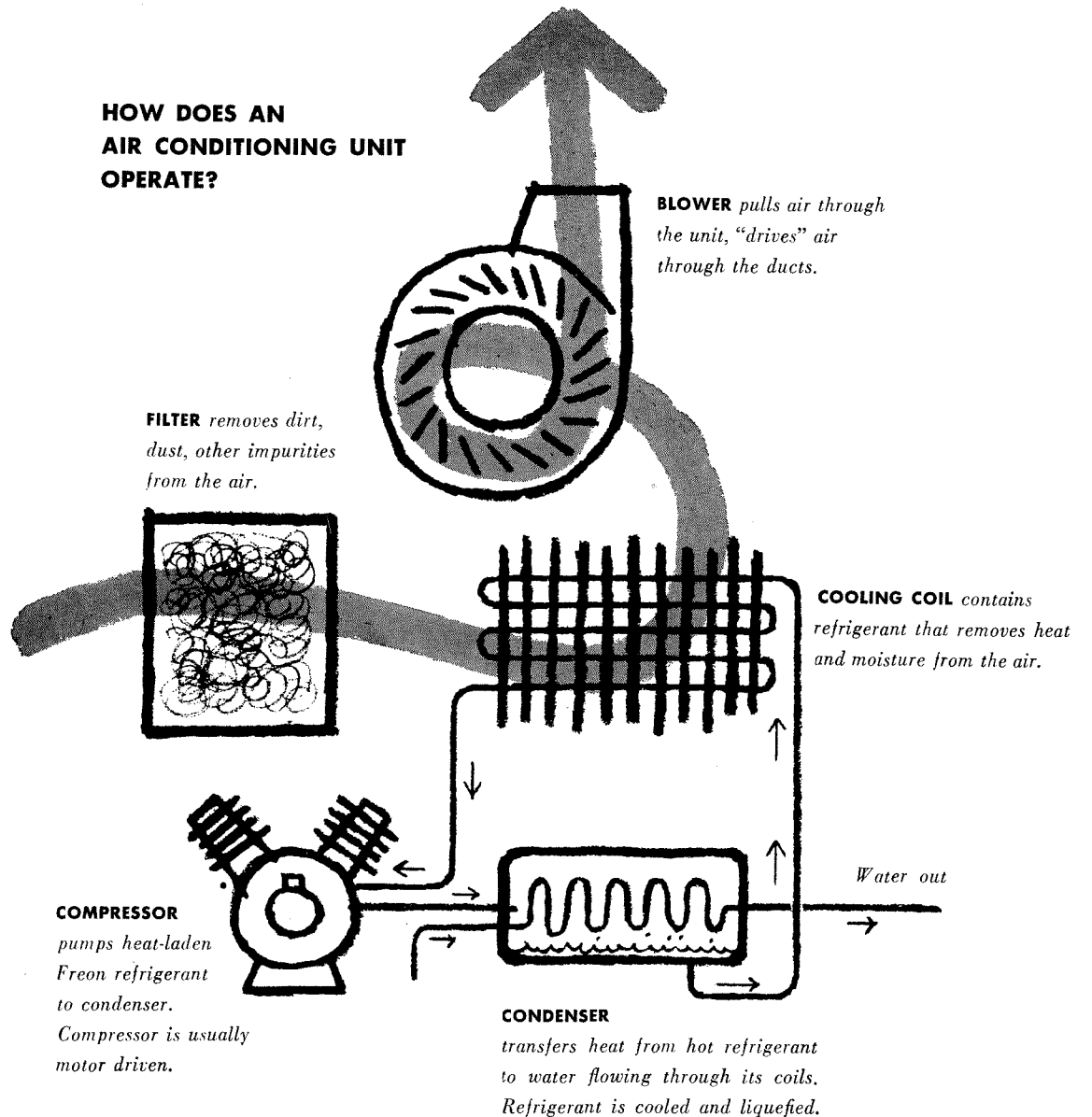
Others

Carl Boester, housing consultant, Purdue University;
Saul Fromkes, president, City Title Insurance Co., New York, N. Y.;
P. I. Prentice, editor & publisher, The Magazine of Building



Typical air conditioner, with machinery exposed, has a sealed compressor and motor in the lower section; condenser is at the rear. One filter is removed from in front of the angled cooling coil. Blower is at the top of the unit.

HOW DOES AN AIR CONDITIONING UNIT OPERATE?



What equipment is on the market?

WHAT IS AIR CONDITIONING?

Air conditioning is probably the most misused term in the builders' vocabulary.

When a builder says, "I've got air conditioning," he may mean that he's done nothing but add moisture to his warm air heating system. He may mean basement air circulates through the house in summer, or that there is an evaporative cooler on the roof. But he does not have complete year round air conditioning unless his system:

1. Heats in winter
2. Cools in summer
3. Removes moisture from the air in summer and adds it in winter
4. Cleans the air by filtering it
5. Circulates air throughout the house, using some outside air constantly to freshen inside air.

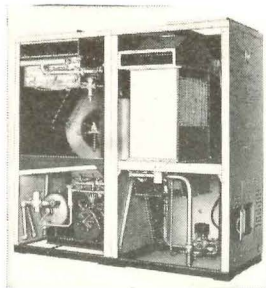
Here are the choices

available to a builder or architect

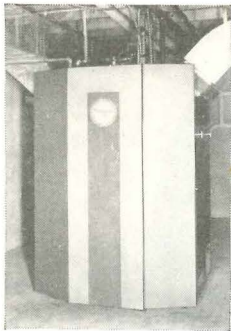
When a builder or architect shops for air conditioning equipment, he finds many makes of units, a variety of first costs and operating costs, and obvious advantages in every type of unit.

To help him over the first hurdles, a short description of the more common types of residential air conditioning units is given on the following pages, with information on cooling towers and equipment costs.

The rudimentary principles of air conditioning, illustrated in the drawing above, apply to window or room air conditioners, to all the commonly used mechanical units and even to the heat pump. They do not apply to evaporative coolers used in the dry regions of the country or to absorption refrigeration units that are powered by gas, oil or steam for cooling. The condenser in the drawing is water cooled, whereas the air cooled type of unit has a condenser coil that is open to the outdoor air, e.g., window models.



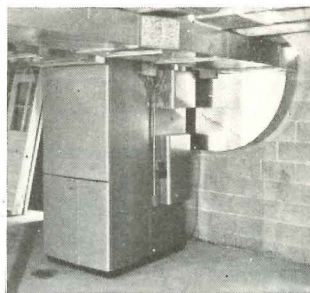
Bryant's combination heater and cooler.



Servel's gas fired combination unit.



Carrier's unit includes gas heater.



Automatic Firing Corp. combination.

Heating and cooling equipment inside one jacket or shell

Since it combines heating and cooling in one the trade calls this a "combination unit."

One blower and one set of ducts handle both warm and cold air. The smaller combination units usually occupy less floor space than separate systems. Duct design may give a more efficient air flow and there may be shorter interconnecting ducts between heater and cooler than when air must travel through two separate units.

The system can be changed from winter to summer operation or back by a single switch. One thermostat controls indoor temperature the year round.

Combination units are manufactured by several firms (see photographs at left and below). One type uses either gas or oil for heating or cooling, the others are electric. All of these use a water cooled condenser, recirculating cooling water through a cooling tower or throwing it away.

Separate cooling units

Separate cooling and heating units do not differ basically from combination units in design or method of operation.

Most manufacturers now building such equipment were in the heating business before they made air conditioners. It was logical to build or buy a cooler, matched in size with their heaters, which could be installed separately.

The fact that a separate cooling unit can be added to almost any warm air heater or furnace means that any heater manufacturer using a central, warm air system with duct distribution can also offer summer cooling by matching his equipment with refrigerated coolers. The two units must be engineered to work together.

Such equipment lets builders offer their house buyers a choice of taking air condi-

tioning with the house or adding it later.

To owners of existing houses, the separate cooling unit is a great asset. It can be put near the present heater and tied into existing ductwork (if there is space for the unit and if ducts are large enough).

Another phase of flexibility is that the separate unit may possibly take less floor space than the combination equipment, as the cooling section may be put on top of the heater or even in the attic. Units may be side by side, or one in front of the other, whichever solves the space problem.

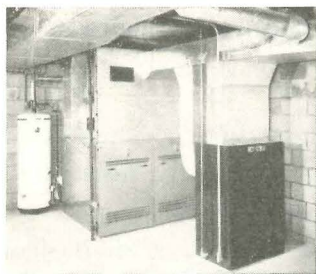
To offset their greater flexibility, separate units may need more servicing than certain combination units. Some equipment needs to have minor adjustments in fall and spring when it is changed from heating to cooling or back. Separate controls

are often required. Installation costs may be slightly more because two pieces of equipment need to be received, installed and tied together with ductwork.

Can separate residential coolers be linked to any forced air system?

No—not unless the heating ducts were sized very liberally. In general, it takes more cold air to bring a room down to a comfortable 75° on a very hot day than to keep it comfortable in winter. Builders who doubt this well accepted engineering fact and use ducts that are too small will discover their cooling system won't operate efficiently.

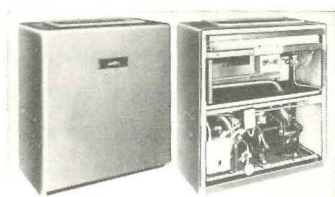
Another reason for caution is that the blower in the heating system may be too small to push the greater amount of summer air through the ducts.



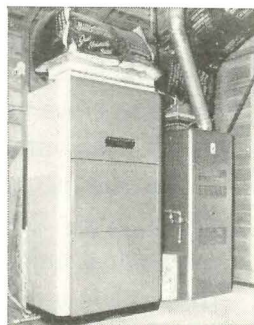
York cooler matched with gas heater.



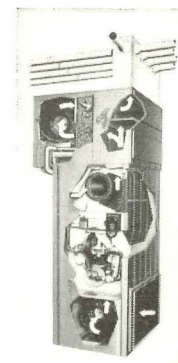
Chrysler unit with Trion filter.



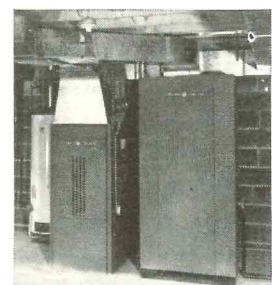
US Air Conditioning Co.



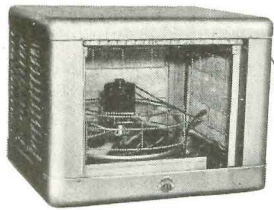
Westinghouse cooler (left)



Coleman's new heater-cooler.



GE matched pair for heating and cooling.



Wright evaporative cooler with front panel removed.

Evaporative coolers—lowest cost summer cooling

Though these provide summer comfort in hot, dry areas, they cannot be called true air conditioning since they do not dehumidify and work effectively in only a small part of the US. They are most popular in the semidesert areas of the Southwest and California or wherever wet bulb temperatures are below 65° and dew point is below 55°.

An evaporative cooler is a box which fits outside a window or sits on the roof. A blower or fan draws a large volume of outside air through a pad of glass fiber, loose excelsior or similar material soaked by a continuous flow of water. Air is not only cooled by picking up moisture, but

cleaned and washed as well. Roof coolers have a plenum under the cooler and short simple ducts that carry air to each room.

But do they really cool? "They're wonderful 11 months a year," say people in Phoenix, "but they're hell when it gets humid." As irrigation is brought into an area, and increases the moisture in the air, as in certain parts of California, the evaporative cooler inevitably loses a good deal of its charm.

Window units cost as little as \$50 but to put a cooler on the roof and install pipes and ducts costs from \$175 to \$300. One roof unit will take care of about 1,000 sq. ft. of floor space.

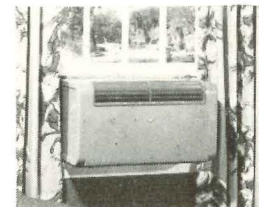
Window or console coolers

Window units fit into a window or are built into the wall. A console cooler is the same general construction but stands on the floor just inside the window. These units, which cool and dehumidify, have water or air cooled condensers. This year 300,000 will probably be sold.

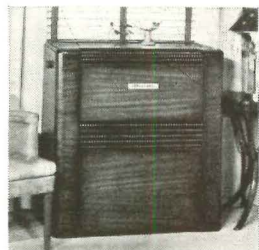
Hundreds of console units are being used in hotels and apartments but few builders have installed them in new houses. At this magazine's round table on air conditioning, Frank Mitchell of Fedders-Quigan criticized builders for not using them. "I look at the bedroom windows being built in homes near where I live. I

see little windows about 20" wide and 12" high. You can't put air conditioners in those bedroom windows."

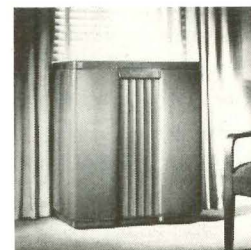
Console types from 3/4 to 2 hp can cool up to three rooms. Air cooled consoles require a window or a wall opening, but water cooled models can be tucked into a closet. Two bedrooms in each house are cooled this way in a Camden, S. C. project (see p. 99). This kind of unit can also be used with ducts to cool bedrooms at night and a living room in the daytime. To work successfully, units handling two zones must be engineered by experts. One hp costs \$750, 2 hp costs \$1,000.



Frigidaire window cooler



Remington window unit



Carrier console type cooler.

Two-in-one heat pump

So far the heat pump (H&H, Apr. '52), which both heats and cools, has not found a way to use its undeniably strong potential. Handicapped by high electric power rates in many areas and expensive installation costs, there are less than 1,500 heat pumps in the US today.

The machine acts as a reversible refrigerator, taking heat from the house air in summer and adding heat in winter. A refrigerant gas acts as the heat transfer agent. To accomplish both purposes a heat pump needs only compressors, condensers and fans. Source of the heat can be water, ground or air. In the Southeast, where water is abundant, the water-to-air system

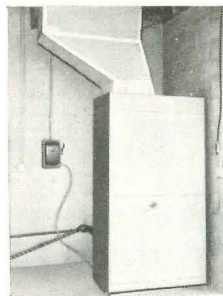
has been a favorite year round air conditioner. In the Southwest, where water is scarce and expensive, the air-to-air type is making sales gains, with dealers crying for a bigger share of the small production. One newspaper ad in Ft. Worth brought 1,000 telephone calls about a heat pump. But the relatively high cost of installation has kept it in the luxury market. To estimate costs roughly, the unit will cost a little more than a heating plant plus a complete air conditioning unit, but its operating cost will be lower (in a cheap power area). Though operating costs are tied to electric power rates, the heat pump's economy stems from the fact that for every unit of heat (electricity) it uses, it borrows two from water or air. Improvements in compressors may be expected to increase this ratio still farther.

Because there is no combustion, no chimney is needed, but the ductwork required is the same as for an ordinary air conditioning system, and the heat pump using air as its source must have a large inlet

and outlet on an outside wall. Water systems need a deep well, either open or closed, in which to gain and exhaust heat.

As might be expected, the South has been the biggest market for heat pumps, though there is a unit installed as far north as Minneapolis (it takes its heat from the bottom of a lake adjoining the house). Another area getting heavy attention from heat pump manufacturers is the TVA region, with its cheap power and balance between heating and cooling needs. The heat pump is tied to the "high cost means low production, low production means high cost" tail chasing, but with GE, Typhoon, Acme, Brunner and Muncie Gear in the field their combined activity should bring important promotional and marketing gains. Biggest assist the heat pump could get would be its installation by a major merchant builder in the middle price field. With the all air conditioned house the hottest thing in the housebuilding industry, the heat pump might be coming into its own.

Typhoon heat pump





American Standard's convector type uses chilled water for cooling, hot water for heating.

Summer cooling with chilled water systems

Builders who prefer wet heat may wonder if summer cooling can be used with it. The answer is yes. Many office buildings, apartment houses and hotels are cooled with chilled water systems.

In new houses a chilled water plant can be put in the basement or equipment room near the boiler. In summer chilled water is pumped through insulated pipes to convector-type units in each room over which air is blown by a fan. The same pipes and the same convector-type units serve in winter and summer. One great advantage is that temperature in each room may be individually controlled. In long, strung out

houses it may be cheaper to install pipes than ducts, although the special room units necessarily cost more than grilles.

In thousands of existing houses where wet heat is installed owners wanting summer cooling will be able to get it with chilled water systems.

Builders who want warm water radiant heat in either floor or ceiling or any form of wet heat can add summer cooling at relatively low cost by locating an air conditioning unit in the center of the house and using very short ducts. A variety of cooling equipment is available, including "store" coolers, console or window units.

How about cooling water?

Any builder or architect considering air conditioning for a group of houses must understand the local water problem. Nearly all systems use water to cool the condenser. A 3-ton condenser will use about 360 gals. per hr. Some cities are using so much water for air conditioning that the summer load has doubled in recent years. In most areas where water is short local ordinances forbid wasting water for air conditioning, or if there are no ordinances, the cost of water makes throwing it away prohibitive except for very small systems. In Philadelphia, water is cheap enough so that it could be wasted, but in the suburbs it costs around seven times as much. Air conditioning systems that use water from wells on the owner's property eliminate the problem.

In a few areas owners of air conditioning systems use the condenser cooling water for their lawns or gardens. They figure they would spend \$50 or so for sprinkling water during most summers (and the hotter the summer the more often they would sprinkle) so they count the cost of their air conditioning water as zero.

But the most common solution to the water problem is to recirculate through cooling towers. Water that circulates through the condenser is piped to the tower. As it cascades down it gives up heat to the surrounding air. Only 5 per cent is lost through evaporation, and the balance is recirculated, generally about 10° colder than before it went through the tower.

Two types of towers

There are two kinds of towers: the first, called a forced draft or an induced draft type, has an electric fan and draws air through the tower. The second has no fan and depends on wind to do the cooling. It is generally referred to as an atmospheric tower, or a natural draft tower.

Each has its advantages. The atmospheric tower is considerably cheaper, costing from \$100 to \$150 (plus the piping and pump), while the forced draft tower may cost from \$400 plus pump and piping. The

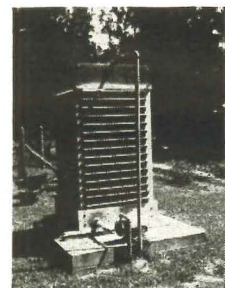
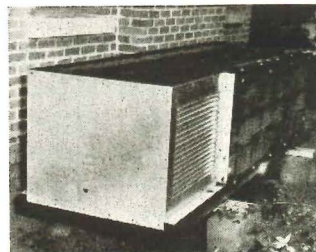
atmospheric type is quieter because there is no fan.

An atmospheric tower must be put in a relatively open space where there will be some breeze. It should not be surrounded with rose bushes or other shrubbery. Therefore it is nearly always more conspicuous than an induced draft tower which can be put next to the house or hidden with vines or a fence. Architects and builders are now putting forced draft towers inside the garage or in an equipment room.



Metal cased forced draft tower.

Horizontal forced draft cooling tower, below.



Atmospheric tower

A new solution: the cooling fountain

Building materials dealer C. C. Rouse of Houston got tired of looking at cooling towers and decided that a water fountain could do the same job. He developed the plumbing sections of a fountain that ejects water horizontally to the center of the pool. The water breaks up into fine particles and is cooled by contact with the air. Engineers agree that his fountains do a good job.

The shape of the pool and the design of the center section can be varied to suit individual taste. His fountains cost about \$400 more than a redwood tower, but not much more than the forced draft tower needed for a 5-ton system.

Below, fountain developed by Rouse



How many tons?

From long experience builders believe they know about how many Btu's of heat they need for a given size of house but if they are in doubt they can always use the next larger heater to add a few more. But heating is relatively cheaper than cooling, and no builder planning air conditioning can treat cooling as casually as he does heating.

A rough rule of thumb is: for each 500 to 600 sq. ft. of floor space figure 1 ton of air conditioning. And normally for each hp of the compressor, there is 1 ton of air conditioning: a 3-hp compressor develops about 3 tons of cooling. The better compressors develop a little more capacity than the less efficient ones.

This rule should be used with great caution because it is valid only when houses are well insulated, when there are no window walls to the west, or any other unusual heat loss. Tests show that the sun bakes a roof up to temperatures around 180°. Without roof insulation, the average house would need a double-size unit for cooling. In Phoenix a long, narrow house with many windows exposed to the sun and with no shade trees or roof overhang would clearly need more cooling than a square house of the same square footage shaded by trees in Wisconsin. Design factors, discussed on page 107, are most important. In fact, a properly designed house can get along with a smaller air conditioning plant than one that is not planned for cooling.

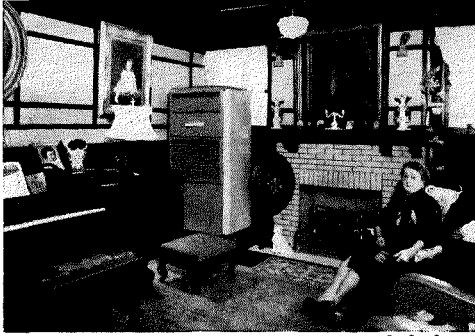
Too much capacity may be worse than not enough because an oversize system does not run enough on a cool humid day to do a good dehumidifying job.

Choosing the right size cooling unit is highly critical. The builder should call in two consultants: an architect to design the house for air conditioning and an experienced air conditioning engineer who can work with the architect and recommend the proper size cooling unit.

How much does air conditioning cost?

It is as difficult to say what air conditioning costs as it is to answer the question: "What does a residential heating system cost?" All these factors have an influence on cost: size of house, type of construction and insulation, amount of glass, duct lengths, cost of a cooling tower, geographical location, labor costs, number of units purchased by a builder, and the degree of perfection demanded by buyers.

One-ton units are being added for \$450 in northern New Jersey and for \$750 in two other areas. This in addition to heating costs.



A package air conditioner will cool a whole house

Two-ton central systems vary from \$750 to \$1,500 in addition to heating. A number of builders are installing 2 tons for around \$1,000, some are paying \$1,200, others \$1,350 and one \$1,500.

Three tons are being installed for as little as \$1,100 but some installations cost \$2,800. As a general rule, 3 tons cost about 50% more than 2 tons because equipment is larger, it is put in a house requiring more ducts, wiring may be heavier and cooling tower costs might be more.

Five-ton units installed cost from \$2,500 to \$6,500. In large houses air conditioning including all installation costs comes to approximately \$1,000 a ton including heating.

Some typical costs around the country:

In Dallas, builders Lewis, Lamberth, Laughlin & Silver are paying about \$1,000 for 2 tons of cooling plus \$500 for heating.

In west Texas Dick Hughes says his 3-ton unit plus heating will cost about that much too, and FHA will evaluate his heating and cooling up to 15% of total house cost.

In Houston, builder Ira Berne is paying \$1,200 for 3 tons of cooling in addition to his heating but his air conditioning contractor says from \$200 to \$300 could be cut out of this price if the house was designed for short ducts and a more efficient installation.

In Kansas City a 2-ton system would cost about \$1,000 plus another \$350 for cooling tower, pump and piping.

Three-ton equipment with both cooling and heating costs from \$1,800 to \$2,000 in Westchester County, but in one project in Connecticut 3 tons with both heating and cooling cost \$3,000.

Three tons of cooling in Philadelphia added \$1,500 to the cost of two groups of houses, in addition to the heating.

In houses under \$15,000, cooling alone has been costing around 10% but some installations have been done for less.

Operating costs

Like the initial cost of equipment, operating costs depend on the climate, how well a house is insulated, how many children run in and out, the cost of water and how cool a temperature is maintained.

Last summer in Philadelphia a 2-ton unit air conditioned a six-room house for a total of \$40, including water and electricity. In Pittsburgh a 2-ton unit cooled a six-room house for \$38. In Houston the electric power company reports that air conditioning costs about 20¢ per ton per day during the warm weather. Last summer cooling was used by most people for 210 days. The Dallas Power Co. advises that air conditioning is used about 1,000 hours during a cool summer, 2,000 for an average summer, and 3,000 for a really hot summer. Operating costs for a 3-ton unit would run from \$61 to \$161 per season depending on temperature. A 5-ton unit would cost from \$118 to \$283. These figures are for electric bills only and do not include water.

Builder Clayton Wyman said it cost a total of \$160 last summer (a very hot summer) to cool a 1,700 sq. ft. house in Houston. A dealer in Houston reported that owners of houses of around 1,200 sq. ft. would pay about \$1 per day for power and for the water they run on their lawns for their 3-ton systems.

In Wichita the water costs on 5-ton gas units were \$10 a month.

In Austin, Tex. monthly operating costs for gas units in \$20,000-\$25,000 houses run about \$30 for water, gas and electricity. Water in Austin for a 3-ton electric system costs about \$15 per month and one owner used it on his lawn, saying he would use that much water anyway.

Operating costs with air-cooled condensers are not yet known.

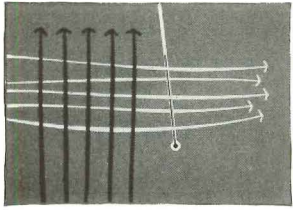
Cooling without water

Cooling water may be expensive or a nuisance. Air cooled condensers eliminate water. This is no novelty as refrigerators are cooled this way, as are many window coolers. But the problem for the larger residential air conditioners is a more difficult one and air cooled compressors are only beginning to be used for such work.

Electronic filters—greatest unused sales tool

In the electronic filter, builders have a valuable potential sales tool for customers who will pay extra for a de luxe job of air cleaning. Builders have already learned that clean air, free of dirt, pollen and other irritants will sell some families on air conditioning who would not buy cooling alone.

When it comes to an extra-special cleaning job, electronic air filters are at their best. They are used in nearly all the new scientific laboratories where clean air is of great importance. They cost about \$350 for a small house and from \$400 to \$1,000 for a large house.



air conditioning

News about duct systems designed for air conditioning

No matter how expensive or efficient a cooling unit is, it won't work well unless the distribution system is right

A distribution system for year round air conditioning should be designed by a specialist because cooling problems are different from heating problems. A duct system that works well for winter heat may not work well for summer cooling.

While precise rules cannot be given that apply to all types of houses in all parts of the country, the following general summary should be helpful both to architects and to builders.

► Ducts for cooling should, in most cases, be larger than heating ducts. Reason: fear of creating a cold spot near outlet grilles prohibits the use of air sufficiently colder than 75° to do a proper job with the same air quantity that is enough for heating.

► Several firms now have "small pipe" duct systems designed for both heating and cooling which use 3½" or 4" metal ducts. (See page 116.) Higher velocities are used in summer than in winter.

► Fresh air should be supplied to the unit through an outside air duct. This is especially important for tightly sealed houses, otherwise no outside air is added to the house except through occasional opening of doors or loosely fitting windows.

► Additional grilles should be provided for living areas or any rooms that may be crowded. Extra air can then be stolen from bedrooms (by temporarily shutting off registers there) to provide increased cooling for parties. Later the extra grilles can be closed to permit the system to function normally again.

► Kitchens should have exhaust fans to carry off cooking heat and food odors. Baths should be vented to the outside or have small exhaust fans. There should be no return from kitchen or baths.

► Supply ducts for cooling must be insulated if they pass through hot attics or other

warm spaces. However, return ducts do not need insulation.

► Equipment noise transmitted through ducts is a serious problem. Supply ducts can be lined with soundproofing; short, straight runs of return duct may require acoustical lining or a baffle.

► The entire distribution system is related to equipment room location. In most in-

stances a central location permits economy because of short duct runs. However in many houses machine rooms are located near kitchen or garage to keep noises away from the living area. In some sprawling houses, there are two or even three equipment rooms and several zonal duct systems.

On these pages four systems are illustrated that typify different designs.

1. SUSPENDED CEILING PLENUM

LOCATION: Houston, Tex.

KOETTER & THARP, Architects

ATLAS AIR CONDITIONING CO., Air conditioning

Surrounding trees combine with roof overhangs to shield this partial two-story house from the sun. Roof insulation and double glazed windows serve as added protection from heat or cold.

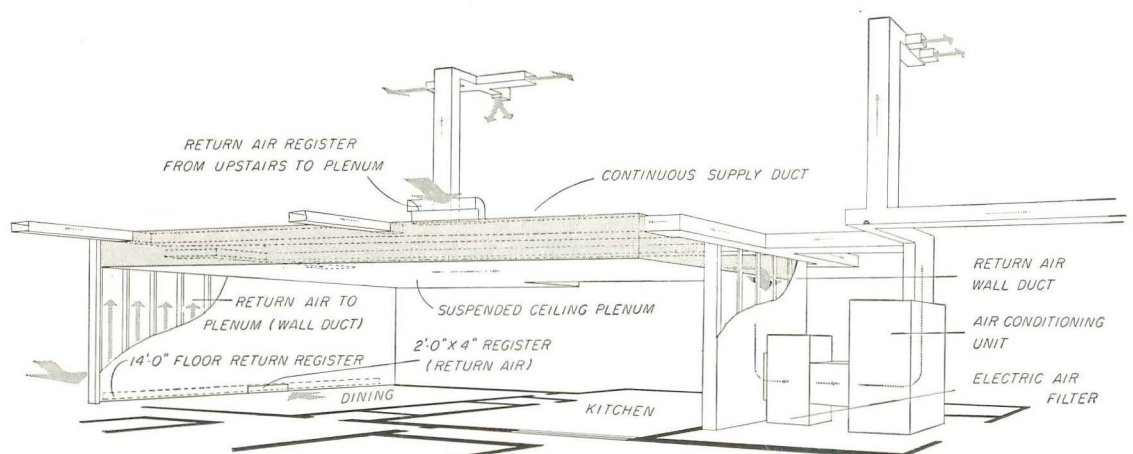
Problem: Provide year round air conditioning without extensive ducts winding through a 4,000 sq. ft. house and without sacrificing either the heating or cooling performance.

Solution: Heating and cooling are supplied by means of a distribution system which fans out and up to all rooms. Air blows into rooms from high wall grilles

and from ceiling diffusers. Air is returned to the air conditioner through baseboard grilles on interior walls. The equipment room is located off the drive-through, with an outside entrance.

That's fine for cooling; what about heating?

The engineers planned for continuous air circulation in winter to prevent cold



air stratification at floor level. This is said to be satisfactory in Houston where winters are not severe, provided double glazing is used in windows. (Return grilles under windows, however, are recommended in colder climates. They scoop cold air off window surfaces and outside walls before the cold can penetrate to the rooms.)

2. A REVERSE FLOW DESIGN

LOCATION: Philadelphia, Pa.
 JOSEPH LUPOWITZ SONS, Builders
 PEIRCE-PHELPS, INC., Air Conditioning

Merchant builders face a dilemma when some buyers want summer cooling, others don't. A case in point: these 1,800 sq. ft., one-story houses have wood floors built over a crawl space. Front is insulated 12" stone. Side and rear walls are brick. Asphalt shingles are used with 2" bat insulation over the ceiling.

Problem: Provide ducts for heating and cooling in 30 houses. Allow for the addition of cooling equipment at the option of the individual buyer, now or at any future time.

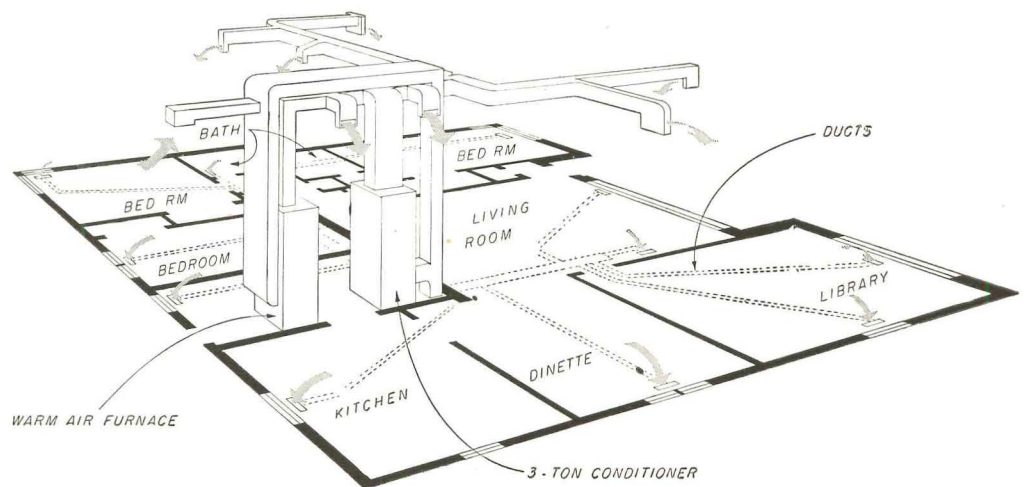
Solution: The builder provided a central location for separate heating and cooling units. The air conditioner can be easily added and linked to the heater. A radial type of perimeter heating provides warm air in winter. Supply ducts extend under the floor to outside walls. Warm air is dispersed through floor registers under windows; glass and outside walls are thus blanketed with warm air. The engineers let air return through grilles high on interior walls, via separate ceiling ducts which lead back to the furnace.

The homeowner operates a change-over damper which reverses the distribution in summer. Cool air is now *supplied* through the ceiling ducts, which are insulated, and

How was cost cut down?

Above the kitchen and dining area is a suspended ceiling space which the engineers used as a return air plenum. Air from outlying rooms flows back to the conditioner through this plenum (see *drawing on p. 112*). Thus, the engineers eliminated the need for return ducts in most of the house and consequently cut costs.

Equipment and cost data: A hot water boiler is teamed up with a 7½ ton air conditioner and hot water is pumped to a coil in the conditioner for heating. An electric air filter, germicidal lamp, and cooling tower round out a de luxe year round system. Total installed cost: approximately \$6,300. Of this, the ductwork, acoustical insulation, grilles were \$1,350.



enters the rooms at the ceiling level.

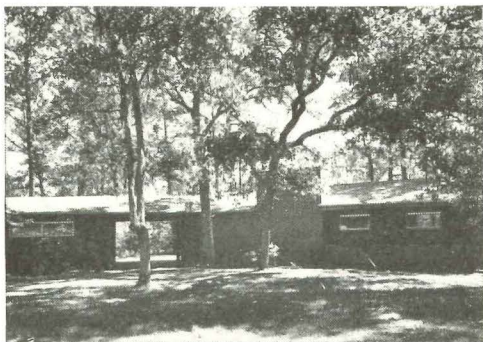
Air is *returned* to the equipment in summer through the floor registers and crawl space ducts. Come winter, the distribution is reversed.

Result: engineers have incorporated proved methods for heating and cooling in a reverse distribution system, i.e., warm air discharged at floor level in winter and cool air directed at the ceiling in summer. (With this type of system, however, it is essential to size all ducts accurately for double duty.) Without cooling, the over-

head ducts are not necessary; air is allowed to flow back to a single return grille in the equipment room door.

Equipment and cost data: Heating alone with a warm air furnace is \$750. Adding a 3-ton air conditioner brings the over-all cost for heating and cooling to approximately \$2,200. A cooling tower isn't included since the city water rates in Philadelphia are favorable for home air conditioning. The houses sell for \$22,250 without cooling; if the buyer wants air conditioning the additional cost is \$1,500.

3. SIMPLIFIED PLANNING



LOCATION: Houston, Tex.
 ARCHITECT, Dean Eichelberger

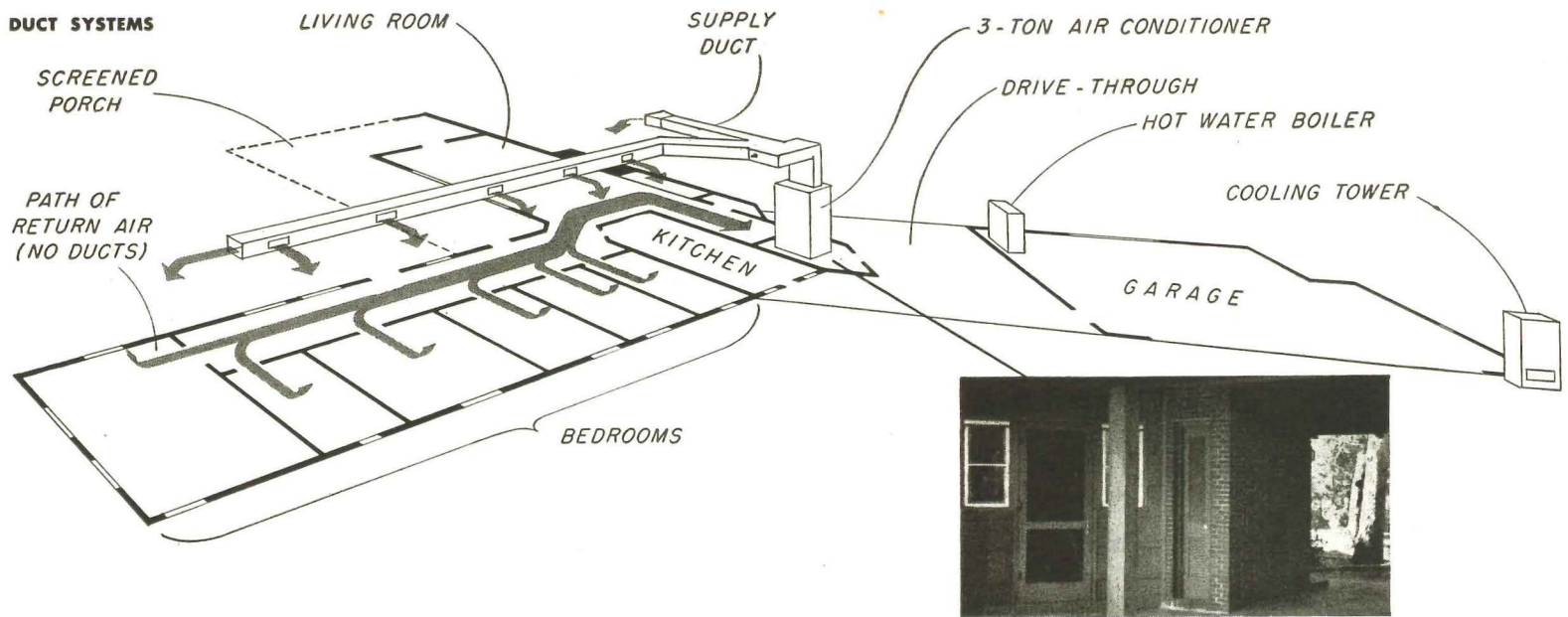
When York air conditioning engineer W. S. Miller installed heating and cooling in his house, he exploited simple design to eliminate extensive ducts and cut costs.

Miller's house (see *photo*) has a brick and shingle exterior and a concrete floor slab; it's in the \$26,500 class. The roof is insulated with glass fiber and insulation

board. Trees shelter the house from summer sun and from north winds in winter.

Problem: Provide year round air conditioning for a Y-shaped plan, with living areas in one wing, bedrooms in the other.

Solution: The air conditioning unit occupies a special equipment room at the center of the Y, convenient to cooling tower and heating boiler, so pipe runs are short. Exterior door gives easy access for servicing.



From the central location a straight overhead run delivers warm or cool air to the row of four bedrooms. This duct is unobtrusively furred-in under the bedroom ceilings and against the interior wall like a running beam. Another duct reaches over the kitchen ceiling to feed air into the dining and living areas.

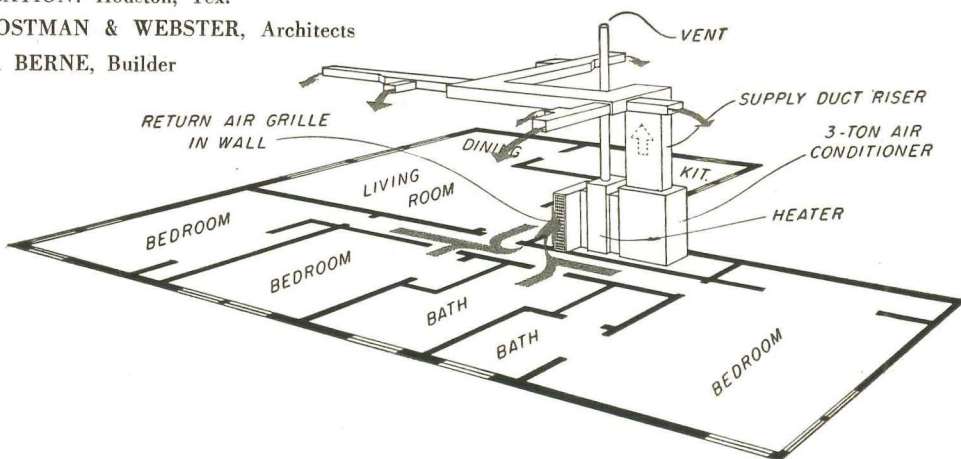
Return air escapes from the bedrooms

through grille openings in the doors, and is pulled back to the air conditioner from all parts of the house. Fresh air is brought in through an opening in the outside door of the equipment room. By careful planning, Miller eliminated any ducts for return or fresh air. Bends and turns, the most expensive items in ductwork, are conspicuously few in this house.

Equipment and cost data: Hot water from a separate boiler is pumped to a coil in the air conditioner for heating. For 1,300 sq. ft. of floor area, there is a 3-ton conditioner. Total cost for the heating and cooling installation was \$1,800. This figure includes \$485 for ducts, grilles and duct insulation where the supply runs through a furred space over the kitchen.

4. AIR CONDITIONING IN \$14,500 HOUSES

LOCATION: Houston, Tex.
 KNOSTMAN & WEBSTER, Architects
 IRA BERNE, Builder



Cooling and heating are distributed to each room by an overhead system in these 1,260 sq. ft. slab houses. There are no return ducts and return air is pulled in through one grille in the equipment room.

Cost for heating and cooling is approximately \$1,600. No cooling tower is used and water is run out onto the lawn.

This house was not designed for air conditioning. The engineer who installed it believes he could save \$200-\$300 by using a furred down supply plenum in the hall and shorter ducts. He could use a 2-ton unit instead of 3-ton if the house was designed for air conditioning. (See p. 89.)

Location of registers or grilles

This is one of the most complicated technical points in air conditioning. Any location in a room tends to be a compromise. The best spot for a heating register (usually low and under windows on outside walls) is not the best for cooling (often high on inside walls, with air directed toward the point where heat gain occurs).

In the South, where cooling is more important than heating, registers are placed with primary consideration given to cooling. In the North, heating is more important and takes priority. When a common duct system is used for both heating and cooling there are advantages and disadvantages to all register locations.

The least expensive duct system is one with the equipment room in the center of the house, using short ducts supplying air from registers high on inside walls. While such ducts perform well for cooling, they may not provide enough warm air in cold climates to keep outside wall and window areas comfortable in winter.

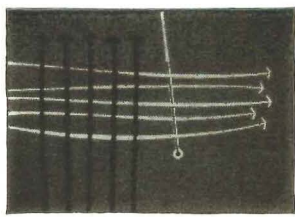
Warm air entering the room from a high outlet may tend to stratify near the ceiling unless properly deflected.

Floor outlets under windows with air directed toward the ceiling are considered by some engineers to be the best solution in the North for year round conditioning. Outlets can be put in the window sill. This arrangement can be made for houses with

basements or crawl space, but require ducts in the slab for on-the-ground houses. Disadvantages are the problem of furniture placement to avoid cold drafts in summer and formation of pockets of cold air.

An interesting variation of normal distribution practice is illustrated in the Lupowitz houses (see p. 113), where the air moves one way in summer through the ducts and the opposite way in winter.

Return air ducts are less important in the South than in the North. Many Southern houses, including large ones, do not have return ducts, as the drawings on these pages show. From this brief discussion, it is clear that the distribution systems and the location of outlets is a matter for experts.



Advice to builders

A digest of suggestions made by engineers, dealers, manufacturers and builders

1. Get your consultants early

Architects, dealers, engineers or other consultants can save a builder up to 20% of the cost of his system if they are brought in early. Installation of an efficient system can be trouble free and economical if it is planned soon enough.

2. How to buy

Buy equipment which is guaranteed for a known period and which will deliver a specified performance. Equipment is usually chosen to produce 80° inside temperature and 50% relative humidity on hottest, most humid days. A builder should know what his equipment is supposed to do and should educate his buyers on what to expect. Residential equipment, especially in builders' houses, is not designed to produce 70° inside temperature when outside temperature is 95° or 100°.

If possible get advice from your own engineer; in any case be sure to get professional advice by using a dealer who has engineers. A dealer who has added air conditioning to his line only recently may not have engineers who can design a system.

Buy from a dealer who is known to give good maintenance. Poor servicing can ruin the reputation of a builder, even though he is not technically responsible for providing maintenance. Poor servicing of the first installation in any community can damage the future of air conditioning. If word gets around that "it won't work," builders will have a liability on their hands instead of a sales asset.

In buying new equipment, a builder should know fairly accurately what monthly operating costs will be. Buyers will be dissatisfied if costs are higher than they anticipate. Both FHA and VA are watching operating costs very carefully.

Don't buy solely on the basis of price. In some areas builders have become so cost conscious of heating that they buy any heater that is cheapest. That policy will not work successfully in buying air conditioning. One builder has already had a disastrous experience from chiseling on his ductwork and installation. He tried to buy cheap, and as a result the subcontractor making the duct installation tried to save money and put in a poor job. The cooling

did not work and the builder got a black eye. After a builder has had several years experience with air conditioning he will know enough to cut some corners, but he'd better not pinch pennies on his first jobs.

3. Good construction is necessary

When a house is loosely constructed or poorly insulated such faults show up faster and are more expensive with cooling than with heating. Roof or attic floor insulation is important in the winter, but is an absolute necessity if the house has summer cooling. Wall insulation is valuable, but is not as vital as in the roof which gets a greater sun load than side walls. The west wall is the most important to insulate.

Good construction, coupled with the design factors described on opposite page, will save money on original equipment and will reduce operating costs.

4. Installation is as important as efficient equipment

Location of equipment room can save money in ducts and piping. It should be large enough for the equipment and also for servicing. The most common criticism that air conditioning dealers have against architects is that equipment rooms are too small and inaccessible. Condensate drains are important and must be planned properly. Provision should be made in advance for pipes to and from cooling towers, and for adequate wiring. If equipment is put in the attic some builders believe it should be mounted on 2" x 10" members, not for added strength but to prevent vibration.

5. Don't skimp on ducts

Cheap ducts are apt to be made of metal that is too light and they will be noisy. If ducts are not tightly joined they will let air escape. When supply ducts go through warm air areas, such as attics, or crawl spaces or basements that are not cooled, they should be insulated. Square elbows without veins will reduce efficiency. Sheet-rock ducts are inadequate for cooling as the outside paper will come off. As a general rule, return air ducts are less important for cooling small houses than for heating but this is a technical problem for engineers.

(Continued on page 154)

How to use air conditioning as a sales tool

Year round air conditioning is one of the greatest potential sales tools a builder can find. Yet scarcely one of them is taking full advantage of it. Here are eight of the best ideas from builders throughout the country:

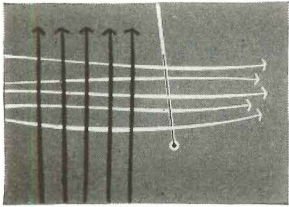
1. Use signs in model house to explain air conditioning equipment and what it does: heats, cools, dehumidifies, cleans.
2. Put a full size "cut away" model of air conditioner in garage, or install one with panels open, and explanatory signs.
3. Hang a pair of dirty filters on garage wall with sign: "This dirt removed from air of this house in only two weeks."
4. Explain how circulating cleaned and filtered outside air is as beneficial as opening windows and cleaner.
5. Dramatize the idea that clean air means less housework: less dusting, less cleaning of rugs, etc.
6. Emphasize health benefits: less pollen, hay fever, smoke, colds, chemicals in the air. Closed windows mean quieter nights.
7. Show how much moisture is removed from house air on a humid day by exhibiting pails of water taken from the system.
8. Use a drawing or a three-dimensional model of the house to show how ducts distribute air to all rooms.

Sell the women

As a general rule, men are already sold on air conditioning from their work experience. But women as a group are not yet sold. Women want windows open, distrust the effect of "cold air" in summer on their children. They are prejudiced against air conditioning because of unpleasant experiences in glacial movies.

These apparent liabilities can be turned into sales assets if builders dramatize the healthful effects of air conditioning. They can also emphasize that residential temperatures can be kept considerably higher than in theaters or restaurants, and that there need be no chilling drafts in a well designed house.

The woman in the family is very definitely the one who will say yes or no to the air conditioned house, and it is she who must be sold by the builder.



heating

What's happening in heating?

In five years residential heating has gone through a steady evolution, including the most complete "disappearing act" in construction history

Residential heating has changed more since 1947 than in any similar period in history. New ideas have so thoroughly altered the design and installation of heating that they can be called either evolutionary or revolutionary.

Heating equipment is not only new and different. It is clearly the best designed and most efficient ever put on the market. Here are the new trends:

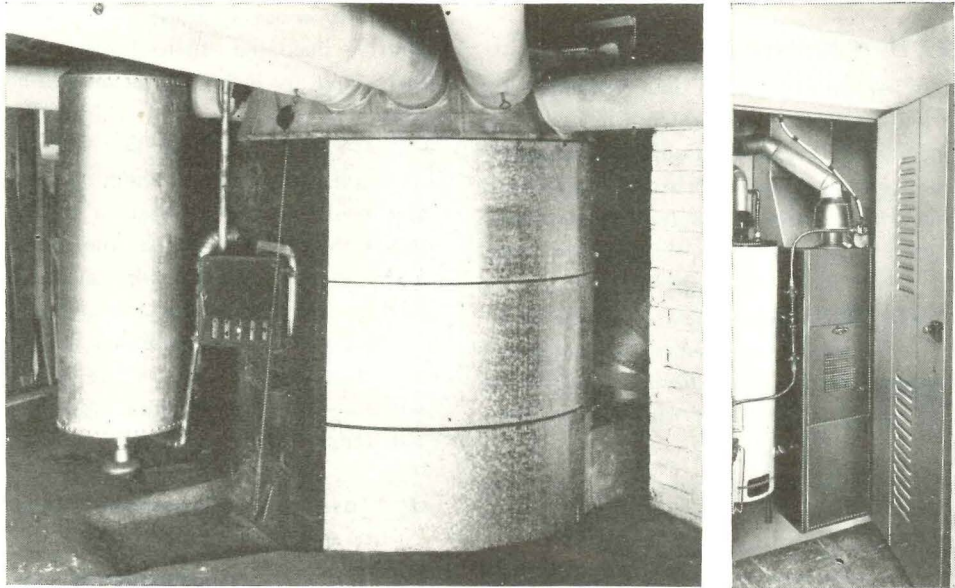
The disappearing act

With the disappearance of the basement in many builders' houses the enormous furnace or boiler has also disappeared. The old-style furnace room has been replaced by a small equipment room located in a closet, or the heater has been moved to a corner of the utility room, to the garage, tucked away in the attic or in a crawl space. Some horizontal heaters are hung from the ceiling or put on a high shelf in an out-of-the-way place. Old-style wall furnaces have been redesigned to occupy less space and yet produce more heat.

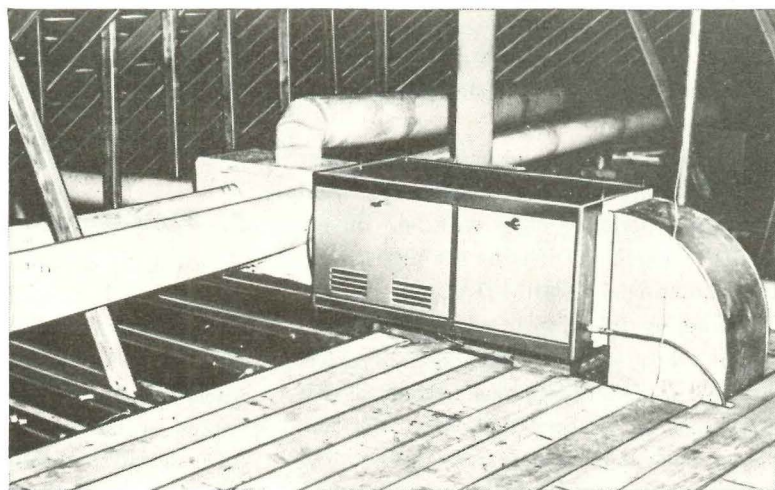
One of the most complete visual disappearing acts has been performed by boiler manufacturers who have made their units so compact and so beautifully tailored that they fit unnoticed into the kitchen. Even in basement houses where space is not so tight the trend toward compactness, begun in the 1930s, is still going on.

Ducts are smaller

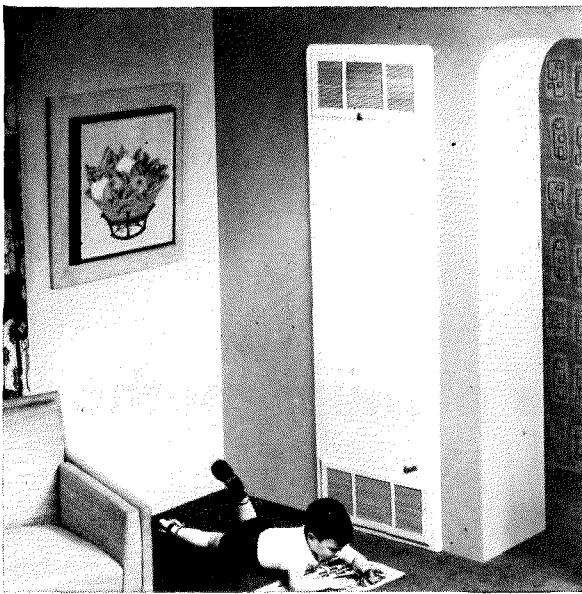
In many slab or crawl space houses the ducts have disappeared as far as the home buyer is concerned, for he never sees them. But even when they are in sight, they are becoming smaller. The trend to smaller ducts is so strong that President John W. Norris of the Lennox Furnace Co. says: "I am so confident that the combination of 4" pipes and the 2" x 14" floor diffusers represents the forced warm air installation of the future that I have freely predicted



Old-fashioned gravity warm air furnace and hot water boiler required enormous space compared to modern equipment. Present-day furnaces can be hidden in closets, attics, or crawl spaces; blowers circulate warm air to all parts of house.



Horizontal furnaces are designed especially for attics or crawl spaces. Box plenum at left of this Norman gas-fired unit dispatches air to ends of house. Return air is pulled up through ceiling at right. This furnace is made in four series, 40,000 to 100,000 Btu's.



Kresky dual wall furnace supplies warm air to front and rear independently. Furnace has a fan, is oil fired, and panels are finished in ivory baked enamel. Access door is built into panel on opposite side. Output is 57,500 Btu's per hour.

that it will be the accepted standard within three to five years."

More than half-a-dozen firms are now offering small pipe systems. Builders, FHA and VA officials have become so vitally interested in them that a new small pipe guide has been prepared by the National Warm Air Heating and Air Conditioning Association.

Also disappearing: the large register

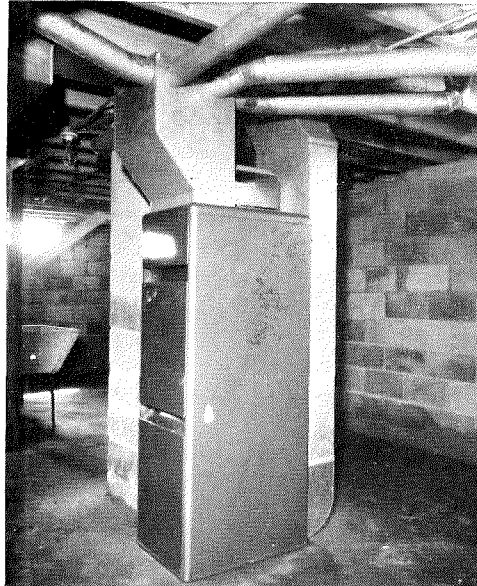
In both warm air and wet heat systems a steady trend has been to make the register or the heat transfer equipment smaller. Old-fashioned radiators have been replaced by inconspicuous convectors or baseboard units. Registers in floors, walls or ceilings are greatly reduced in size.

Some systems, such as warm water radiant panels in floor or ceiling, or electric panels in the ceiling, leave no evidence of heating outlets.

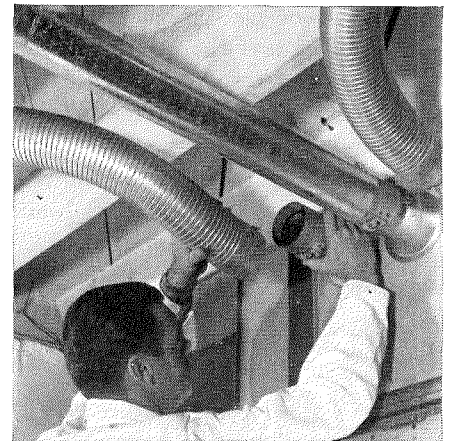
More experimentation, better engineering

Credit for the improvements in heating should go partly to the merchant builders who wanted something better and who were willing to work with manufacturers and to experiment. Credit should also go to manufacturers who are spending large sums of money for research to improve their units. Research sponsored by the National Warm Air Heating and Air Conditioning Association at the University of Illinois and also by the Institute of Boiler and Radiator Manufacturers has been directly responsible for many improvements. Steady information from FHA and VA has kept builders informed as to both successes and failures in systems that have been tried out.

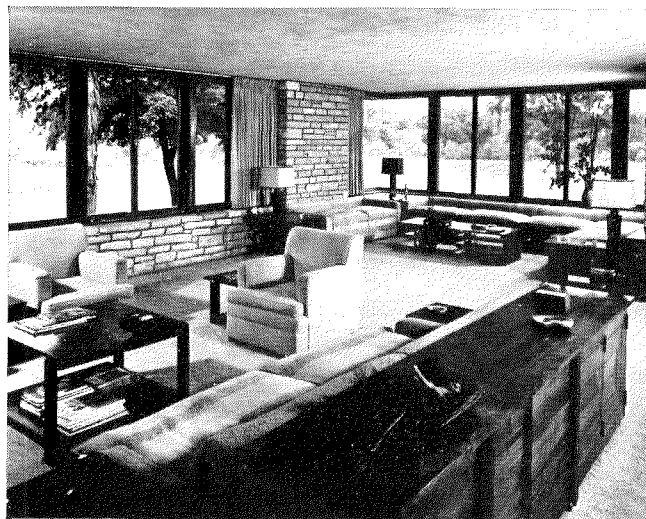
The photographs on these eight pages illustrate the trends. Those on the preceding pages show the beginnings of a trend to year round air conditioning that will affect builders in many parts of the country.



The compact Janitrol furnace with its 4" ducts owes much to research in aircraft heating this firm does. Engineers have emphasized highly responsive, compact furnaces; continuous air circulation; sensitive thermostats and small pipe distribution for perimeter systems.



Coleman ducts are fast to install because flexible sections eliminate elbows and other expensive fittings.



Zonal system is ideal solution for large house with much glass. Rooms like this facing south need little heat on sunny days, should have a separate thermostat. Rooms on north need to be zoned separately so they can be provided with heat whenever they need it.

Minneapolis Honeywell's outside "anticipator," below, can forecast inside heating needs.



heating

Newest contender: the crawl space plenum method

Most significant news in residential heating during recent months is that the crawl space plenum method has proved to be one of the most efficient systems developed.

This rather casual method of blowing air into a crawl space from short, stub ducts in a counter flow furnace and forcing it into the house through floor registers (see drawing, lower right) has been thoroughly tested by the Mobile Field Testing Unit of the Warm Air Heating and Air Conditioning Association. These tests, last winter, revealed that the system worked extraordinarily well.

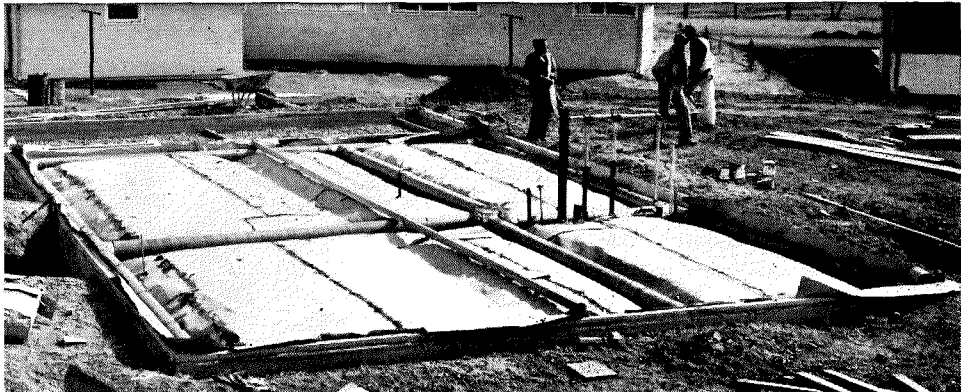
Principal advantage is the low cost of installation, due to the speed of installing the stub ducts. Because the entire crawl space is kept warm, the floor is warm.

Builders are cautioned, however, that many codes forbid the use of open plenums; heating ducts must extend fully to all registers. Though already proved safe and efficient, crawl space plenums are restricted in some areas until codes are revised.

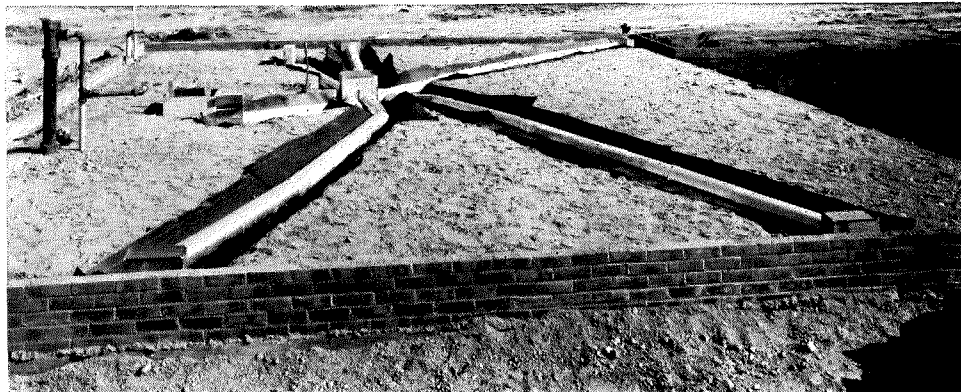
An absolute necessity with this method is to insulate the foundation wall to prevent heat loss. Another requisite is to prepare the area below the house so that vegetation does not grow and to erect some kind of moisture barrier. Some of the early experimenters had weeds growing under their houses. When the weeds died in the fall the smell of rank vegetation was pumped through the house. It was also discovered that this heating system will not work well in damp, poorly drained areas.

Enthusiasts for the small pipe system believe builders will find it is just as cheap to run 4" ducts through the crawl space as it is to take all the precautions necessary to insulate and install a moisture barrier for crawl space plenum heating. A moisture barrier, preferably laid on 4" of gravel, must be used in crawl space plenums. Field tests show that there is not an excessive drying out of wood framing and floors with this method.

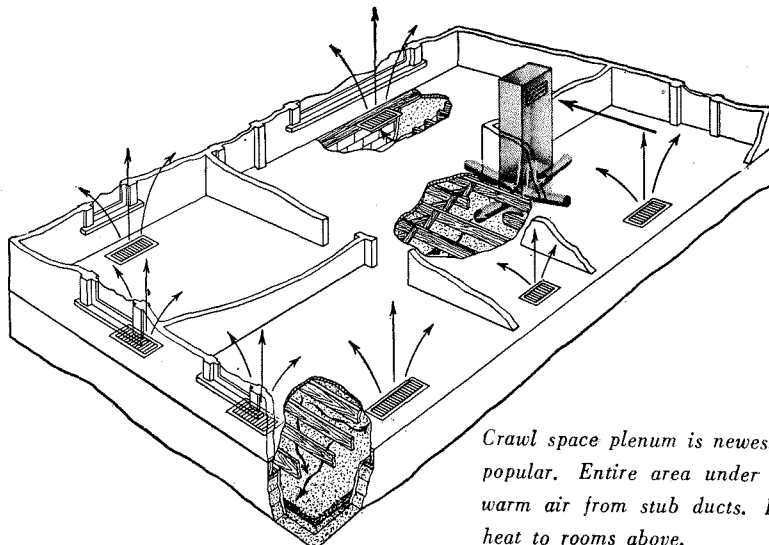
A considerable amount of experimentation is now going on among builders in



A perimeter system with four feeder ducts leading to an outside loop has become standard for many builders of slab houses.



A radial system, without a perimeter loop, is used in many areas. Duct runs are shorter, but some exterior floor areas are colder.



Crawl space plenum is newest method to become popular. Entire area under floor is filled with warm air from stub ducts. Floor registers send heat to rooms above.



Tod Sloan is convinced assembly, left, is superior to square box plenum under furnace. Elbows act as turning vanes, reduce turbulence. Sheet metal elbows are cheaper than precast concrete plenum.

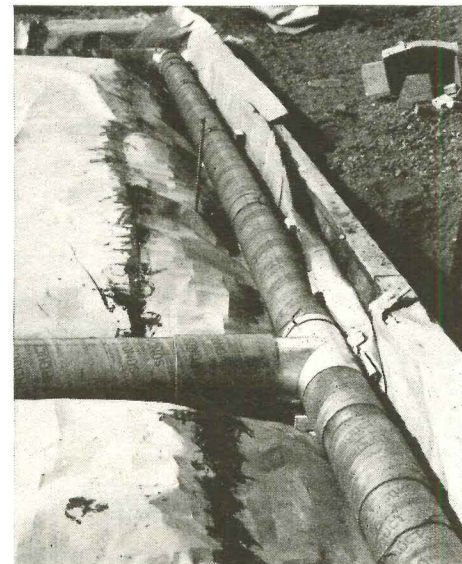
all parts of the US with many kinds of systems. Nearly every big builder is trying to give his clients a better, more economical system. Such activity, combined with the manufacturers' own progressive attitude, is certain to bring steady improvements.

Experiment in Colorado Springs

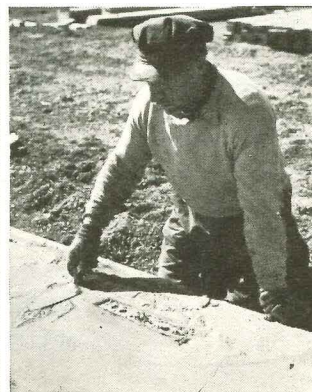
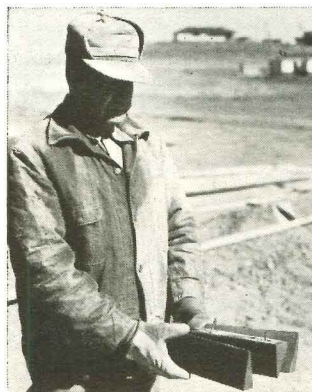
Builder H. M. (Tod) Sloan of Colorado Springs is representative of progressive experimenters. Using asphalt-impregnated fiber ducts in his slab houses, he believes he provides an efficient heating system at minimum cost.

Sloan claims to have cut duct costs 25% to 33% by reducing freight and handling costs. He uses three duct sizes and the factory nests 6" ducts inside 7", and these two inside 8" ducts. Thus he gets approximately three times as many ducts in a carload as he could without nesting. His installation costs are also low because two men "regularly will install the entire duct system in a 1,000 sq. ft. house in less than 2 hrs." (Photos, right, show details.)

Sloan also saves money by placing his very simple plenum chamber below his down-draft furnace, which consists of four standard 8" elbows. Another economy comes from the absence of expensive fittings to take his 2" x 14" floor register.



Above: concrete poured around ducts. Photo at right shows spun glass insulation around perimeter foundation and 2 by 4 blocks that raise duct 2" so concrete can be spread below.

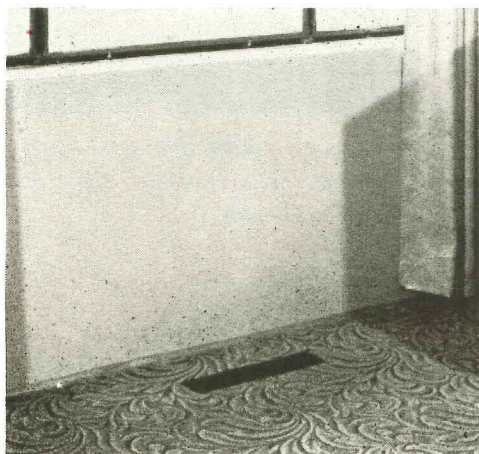


1

2

3

Sloan saves time by using (1) three triangular shaped wood blocks to form register openings. Blocks are screwed to fiber ducts, and can be used many times. Cement finisher trowels around them, (2) and blocks are removed next day. Workman saws through fiber duct, (3) Register is 2" x 14".



The 2" x 14" floor registers are set out from the wall enough to be clear of curtains and small enough to be inconspicuous but provide a curtain of warm air over window and outside wall.



Mobile Field Unit engineers, left, from National Warm Air Association have checked heating in hundreds of houses, have contributed valuable information.

heating

Warm water systems offer much that is new

In the trend toward compact heaters and heat transfer equipment the "wet heat" manufacturers take off their hats to no one.

Some of the most remarkable demonstrations of space saving equipment have been by the boiler makers. In-the-wall convectors, baseboard units that can scarcely be seen and warm water radiant heat in floor and ceiling have completely transformed typical prewar warm water installations.

Three examples of ingenious boilers are illustrated on this page. Two are no larger than a kitchen stove, yet each contains an oil burner, a boiler, a pump and a domestic hot water coil.

ADVICE ON BUYING BOILERS

1. Builders should accept only boilers with the marking ASME in order to be sure of durability and good construction.
2. The IBR stamp (Institute of Boiler & Radiator Mfgs.) assures a buyer that a cast iron boiler will produce the output it is supposed to deliver.
3. Steel boilers should carry the SBI label (Steel Boiler Institute) as an assurance of rated capacity.

Baseboard radiation

The inconspicuous, highly efficient baseboard unit has been a real advance in the warm water heating field. It completely overcomes the housewife's objection to old-fashioned radiators: the space they take up.

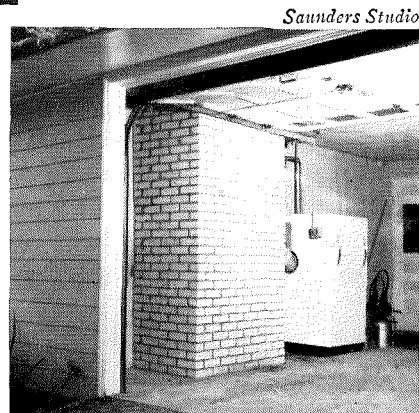
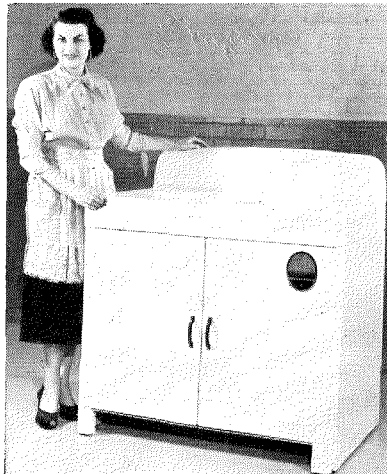
The baseboard unit is an elongated radiator or convector. Because it is carried around the outside walls of most rooms, it becomes a perimeter system, providing warm walls and an even room temperature.

The *series loop* is the latest method of installing baseboard units. Because the baseboard itself is the "main line," dozens of fittings and connections are eliminated. Research at the Univ. of Illinois has proved that total cost of piping can be reduced approximately 50% compared with old-type installations. (See drawing opposite.)



York-Shipley unit has 90,000 Btu hot water boiler plus domestic hot water coil. It must sit next to brick or insulated wall to get a chimney outlet. In Levittown houses (H & H, Feb. '52) it is in kitchen and stainless steel top provides a valuable work surface. Size: 30" x 25" x 36".

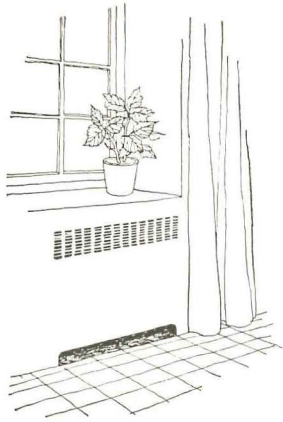
M. C. Hartwick



Saunders Studio

National's 116,000 Btu boiler has a tankless hot water heater. Size is 32" x 30" x 56" high.

Copper heat cast iron boiler, left, is 38" x 24" x 36", has 120,000 Btu input burner. Chimney connection is at rear. Oil burner, pump and expansion tank are inside the jacket, at the right of boiler. Jacket is insulated with 1" glass fiber.



Drawing of a typical convector that is completely recessed in wall: a series loop can be used for hook-up.

Panel heating

Should warm water radiant heat be put in floor or ceiling? While the floor sounds like a more logical location, there are arguments in favor of putting such heat in the ceiling. Although warm air rises, heat as a form of energy will travel downward. With ceiling panels kept at from 100° to 120°, rooms are warmed evenly. Up to 70% of the heat gain is radiated from the ceiling compared with 50% radiated from floor panels.

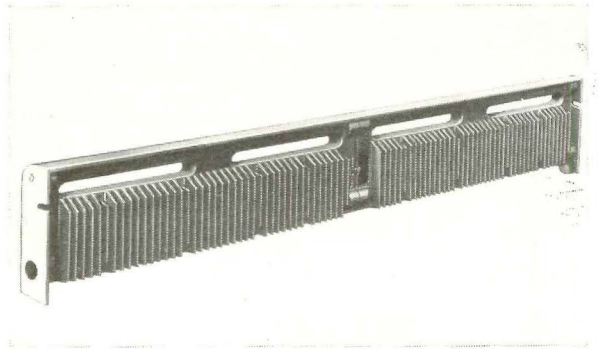
There is less heat lag in ceiling panels since the mass there is less dense than in a concrete slab. Ceiling panels require more time to install but operating costs are lower. Although laboratory tests show that people are more comfortable with ceiling heat, it is significant that the largest builder in both Chicago and New York uses wet heat in the slab and finds the buyers like it.

Precautions on radiant heat in slab

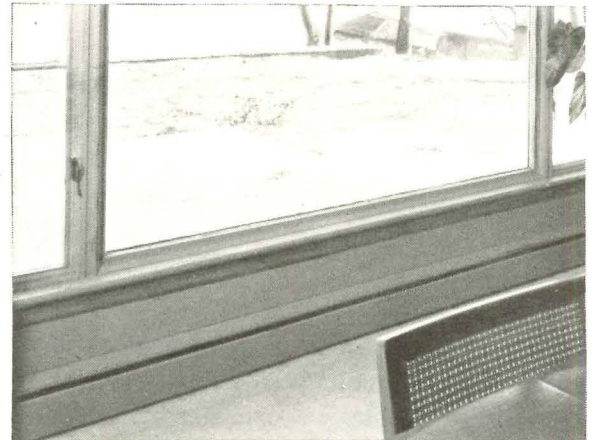
1. Avoid wet ground. Heating panels should not be installed in a slab where the water table is less than five feet from the surface.
2. Builders should only use *inorganic* insulation for the slab such as foam-block.
3. Water under 150 psi pressure should be put through the closed pipe circuit before the concrete is poured. If no leaks develop the builder can then be sure that pipes and fittings will stand up under expansion stress inside the slab.

An electronic control system is believed to be the first practical means for controlling floor panel heating. A supersensitive electronic thermostat is located outdoors. It actually forecasts heat requirements inside the house before a weather change occurs. The outdoor thermostat is co-ordinated with inside controls to anticipate heat requirements and regulate slab temperatures accordingly.

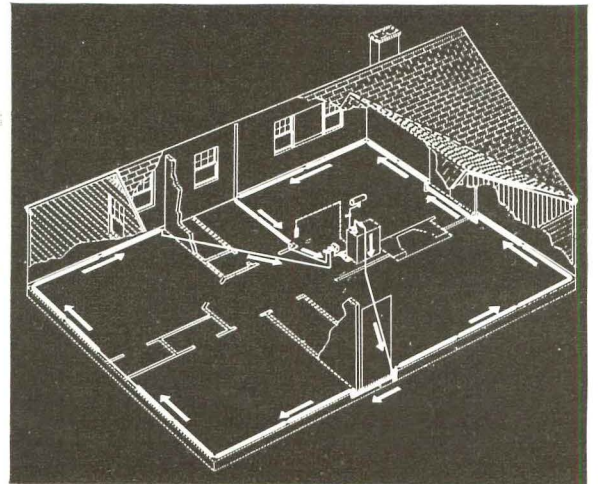
Rear of Burnham's cast iron baseboard unit. Hot water is supplied at temperatures up to 200°. Baseboard units average 7" high, come in many lengths for all size rooms.



Baseboard units, right, are at floor level in place of wooden baseboard. The Webster unit radiates heat through horizontal opening 5" above floor level in this room.

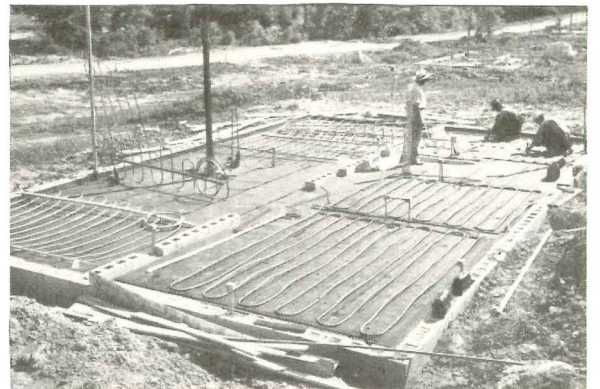


Hot water is pumped through two "series loops" of this perimeter baseboard system. Hot water passes through all units in flow around circuit. In series loop units are not bypassed by parallel connections. Fifty-seven firms make baseboard units.

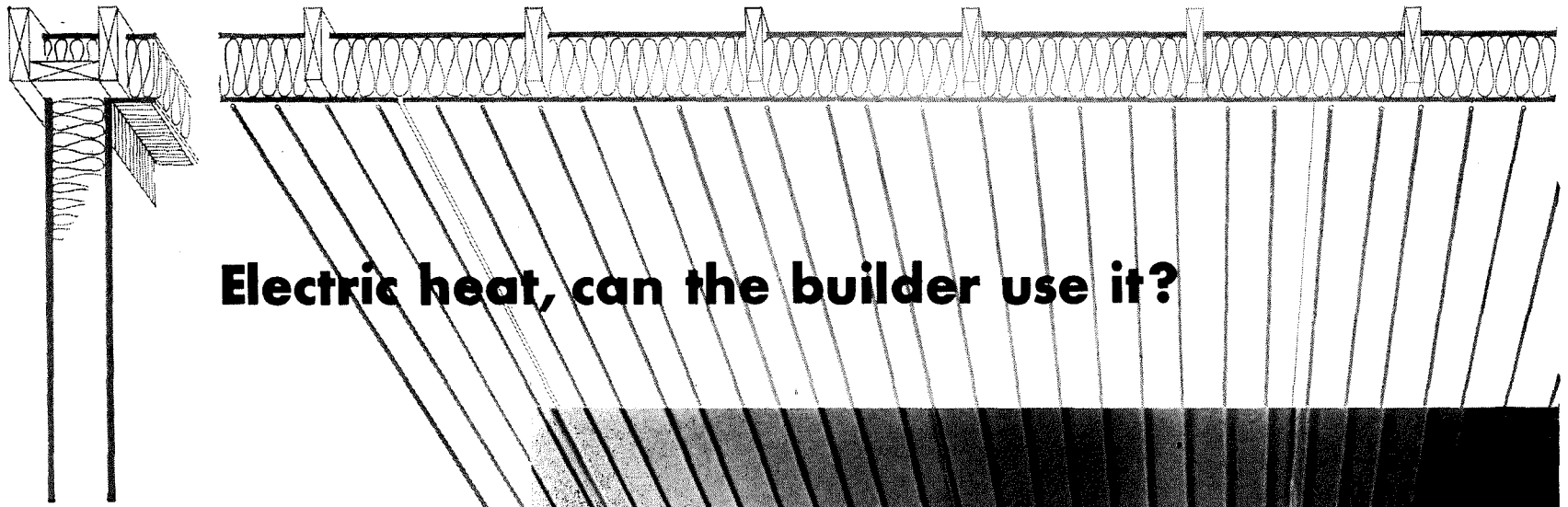


Experienced crews can cut installation costs of ceiling heat panels. It is important for coils to be installed carefully to prevent possibility of plaster cracking.

McGraw-Hill



Installation of copper pipe coils is carefully supervised to prevent "creasing," and to insure that all fittings are tightly connected. Slab should be protected from moisture and only inorganic insulation should be used.



Electric heat, can the builder use it?

IN A FEW favored areas of the us chimneys are disappearing from roof lines, and builders are finding a strong sales gimmick: electric heat. Where power rates permit, all-electric heating systems are both practical and popular with housebuyers, and rising costs of combustible fuels make the newcomer more competitive every year. Though first costs are relatively low, due to easy installation, high power rates or undue heat loss can make operation dear.

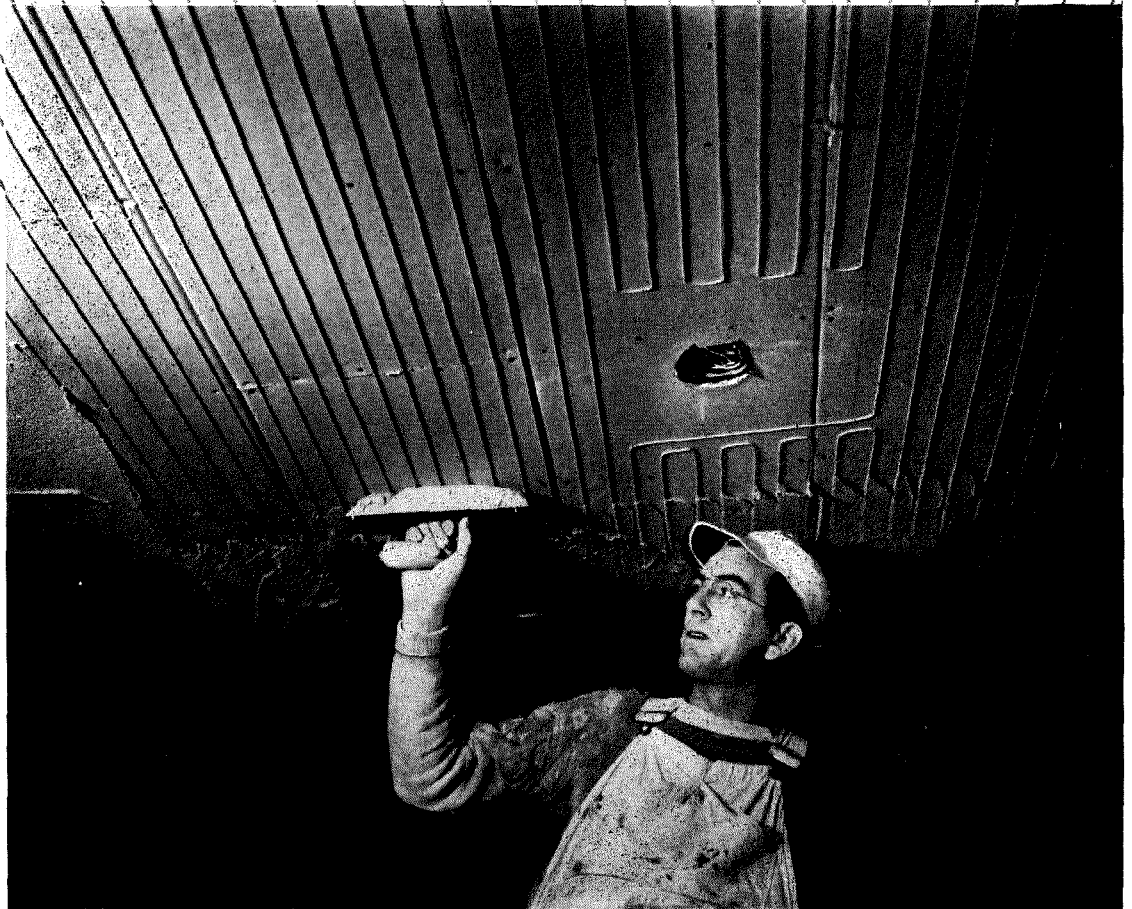
The builder interested in attracting women housebuyers with the cleanliness of electricity and men with the low maintenance and replacement costs must ask:

1. How high are local electric rates?
2. Is the house insulated to the requirements of this heating system?

To be completely competitive with gas, coal or oil, electric heating has to enjoy a rate of $1\frac{1}{2}\text{¢}$ per kWh or less. Up to 2¢ per kWh, electricity is still feasible, provided the homeowner is willing to pay a reasonable premium for the convenience and safety of the system.

Utility companies in some areas have deliberately discouraged the use of electric heat for one primary reason: it threatened to increase their peak load during the winter without a corresponding use of the facilities during the nonheating months. Peak loads vary tremendously and there is no way to store up electricity. The system must be geared to the dark afternoon in December, when everything that will draw current is turned on. Those periods determine plant capacity, not the average load.

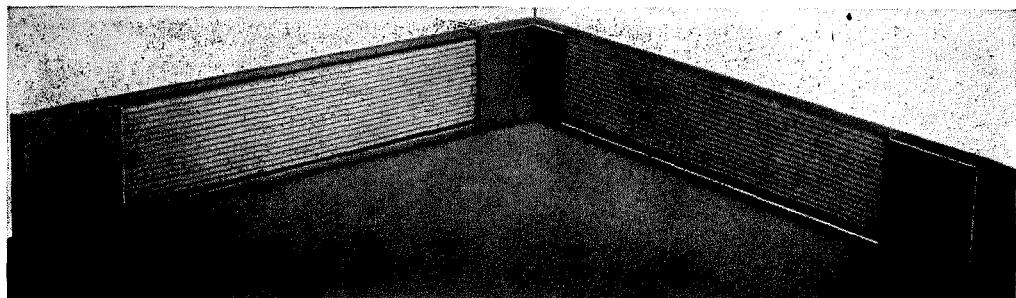
One factor that promises to help this situation is the increase in summer cooling equipment to balance the demand. Some southern cities, including Memphis, Dallas

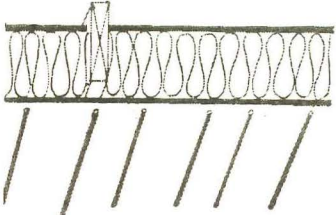


Thompsons

In radiant panel system resistance wire is fastened to gypsum lath with patented stapling gun, then embedded in ceiling plaster. A 6' nonheating lead connects heating cable and junction box. Heat is not turned on until plaster has dried thoroughly to avoid too rapid "dry-out" or "sweat-out."

Radiant glass panels, 6" high are now made in baseboard shape for either new or remodeled houses. Furniture should not be placed directly in front of units as radiant heat will be blocked. Aluminum reflectors behind glass panels direct heat out into room, rather than back into walls.





and Houston, already have a summer peak rather than the ordinary winter one, due to the increased use of air conditioning.

Current NPA rules allow just 50 lbs. of copper in a house using electric heat (15 lbs. extra). Unless every design economy is used, the wiring of an electric heating system can use this up fast. To compensate, the absence of any pipes, ducts, furnaces or chimneys frees design of the house to a hitherto unknown degree. With good planning great advantage can be taken of this.

Though manufacturers disagree on how and where electric heat should be used, all are agreed on the importance of insulation. Most of them refuse to guarantee their equipment in houses that are not insulated to their specifications.

Ceilings are required to have at least 4" of insulation (not reflective) with a U factor of .07 or less in both ceiling and walls. With wood floors, the U factor should be .125 or less; and with a slab, 4" of loose gravel and a vapor seal are called for. In areas having over 4,500 degree days, weather stripping and storm windows and doors are required. Poorly insulated walls act just like a blotter, absorbing the radiated heat from the body at a faster than comfortable rate.

Builders have found that they can put electric heat into speculative houses where

power is cheap and winters are mild. In the TVA area, there are more than 75,000 all-electric houses. Large projects in the South and West where winters are mild have used electric heat successfully. In some parts of the North and East, builders are taking advantage of the popularity of the system.

The builder who plans to use electric heat has a choice of two basic systems:

1. Radiation: Radiant panel systems, currently in use in many builders' projects, function primarily by raising the temperature of the interior surfaces of rooms, rather than the air itself. Most common are glass wall panels and various forms of ceiling panels. A resistance wire embedded in a plastered ceiling has been in use for many years, while a rubber manufacturer and a leading electrical firm have brought out panels using, respectively, conductive rubber and a copper filament-vinyl resin-foil sandwich, both specifically intended for ceiling installation.

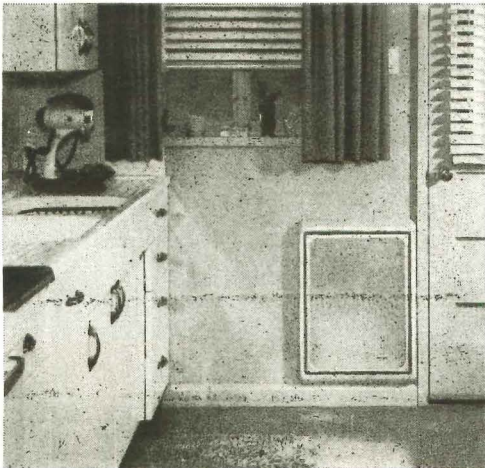
Ceiling advocates claim their location provides the highest degree of radiant heat (70%) and that the ceiling offers the largest unobstructed area from which heat can be radiated. Its large surface can be low temperature source of heat and it puts no limitations on furniture placement.

Glass panels, furnished for either walls or baseboards, have metallic conductors permanently fused into the backs. Though they reach a relatively high temperature (300°) they will not burn the skin on temporary contact and are incapable of setting fire even to inflammable materials.

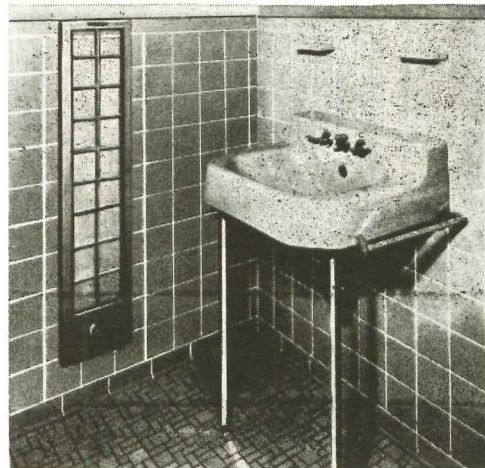
2. Convection: The West Coast, with its light heating load and favorable power rates, has long been a stronghold of electric heat. Most common system is that of convection in which air is warmed around heated coils, radiators or resistance wires, expands and rises, setting up a circulation within the room. The heated air transfers its heat to the objects in the room. One drawback to convection-type heaters is the problem of "smudge" on walls and ceilings from dust borne by the moving air.

Though electric installations cannot compete in first cost with the cheapest warm air systems, they do compete with quality installations (and, of course, there is no maintenance or replacement to consider). One production builder in Knoxville claimed that \$400 will cover all costs of a heating system for a 1,000 sq. ft. house. Other panel systems run between \$65 and \$80 per 1,000 cu. ft. Conductive rubber panels are considerably higher today, but they are just beginning to get into mass production and the cost may be expected to drop.

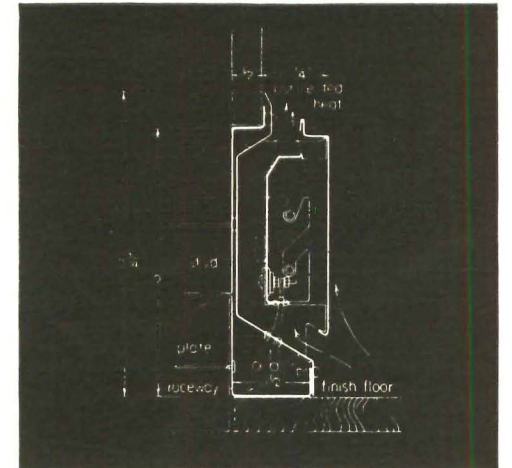
Rodden



Metal heating element is fused into back of glass panel and all units carry guarantee against breakage. Panels can be individually controlled so that only rooms in actual use need be heated. The first use of radiant glass was in the deep, damp tunnels of the Maginot Line fortifications.



Supplementary heat is easily furnished by electric units in bath or nursery, or where extension of present heating system would be too expensive. Panels come in several sizes and shapes to fit specific needs. Average panel costs \$75-\$80 completely installed, heats approximately 1,000 cu. ft.



Convactor baseboard unit illustrates basic method of all convector heat. Cold air on floor is drawn in at bottom, heated by resistance wires, then rises along wall to set up circulation in room air. Other units use fins or coils as heating surface, with built-in fans to distribute warm air.

TEXTBOOK HOUSE

Its compact plan, its clear, expandable structure and its novel framing details make this an important solution to the problem of the small house.

This 1,600 sq. ft. house has three things to suggest to builders and architects alike. And it makes its points clearly and well:

First, its **utility-core plan** with interior baths is a neat and well studied solution for the three-bedroom house;

Second, its **post-and-beam structure** makes future expansion much easier than the traditional balloon frame could;

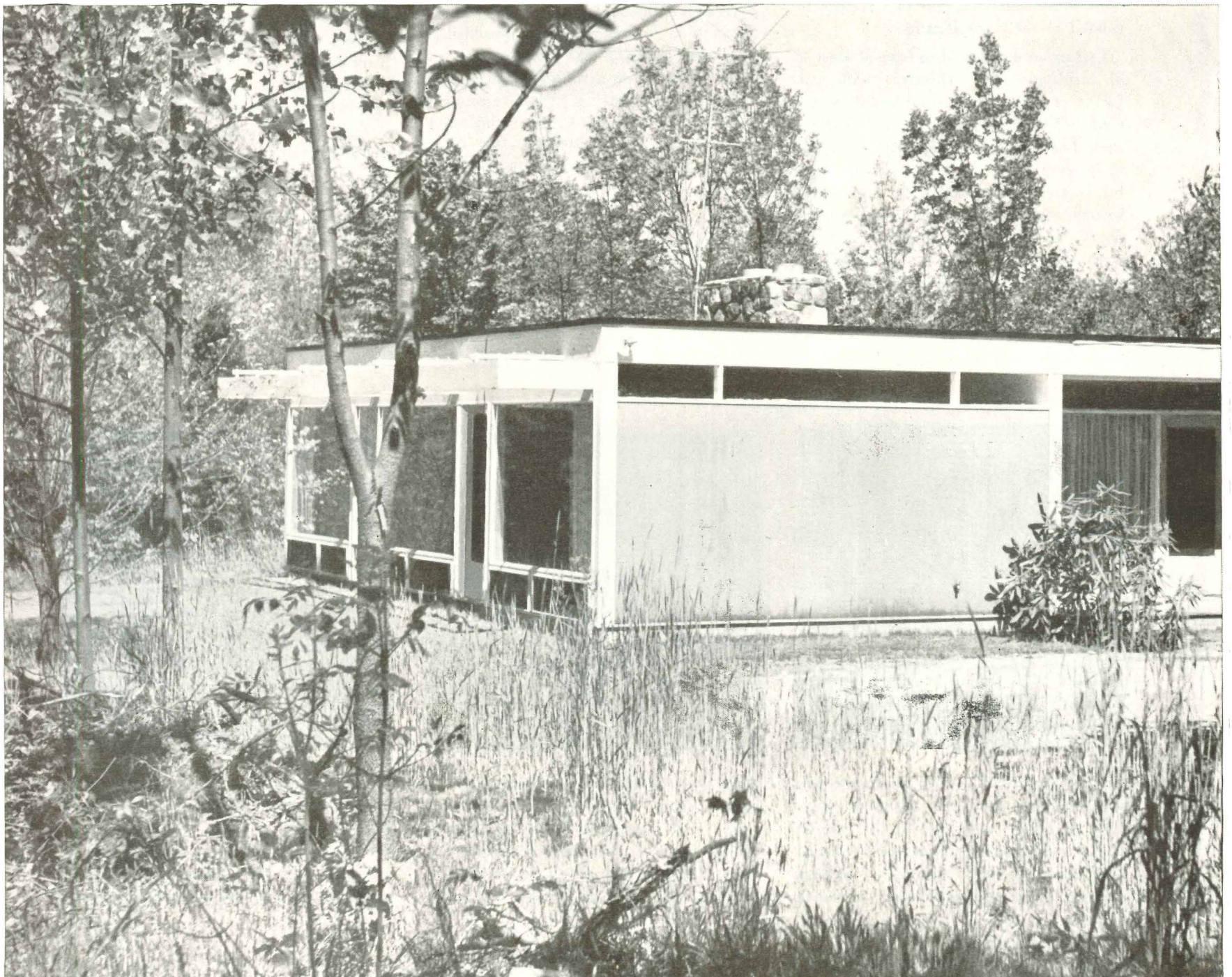
Third, and most important, its **framing system** (which mixes rough and milled lumber) makes the assembly of wall panels, windows and doors an effortless operation. It promises to make it an increasingly economical operation as well—for unlike many modern wood houses (which *look* simple but turn out to be hard and expensive to build) this one *is* simple to frame, to finish and to expand.

LOCATION: New Canaan, Conn.

JOHN MACLANE JOHANSEN, Architect

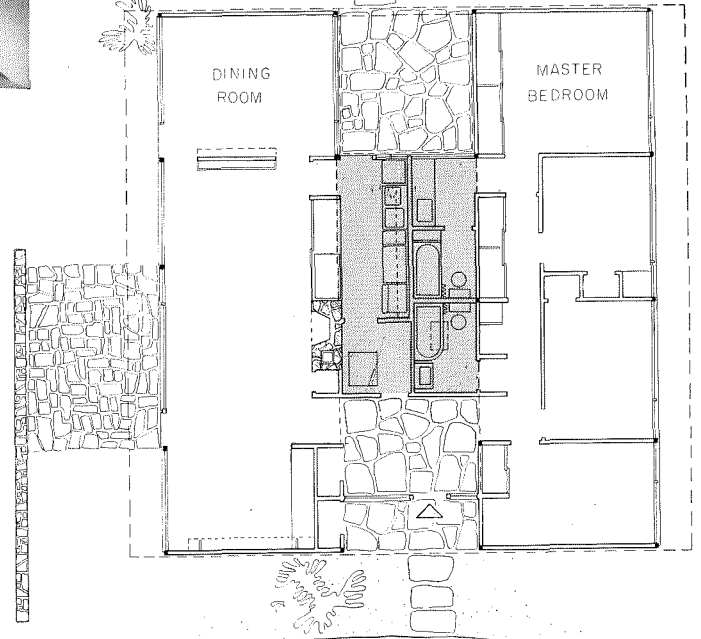
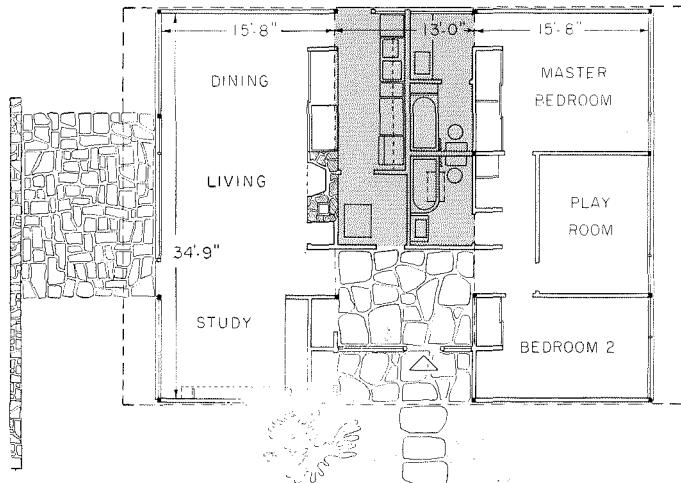
THEODORE DE F. HOBBS, General Contractor

Photo: P. B.





DAY SERVICE NIGHT



Plan at left shows house in present stage, a 35' by 45' rectangle divided into daytime, service and nighttime zones. The post-and-beam framing makes future expansion easy, and plans (above) are already drawn to add a new dining area, new dining patio, and new master bedroom.

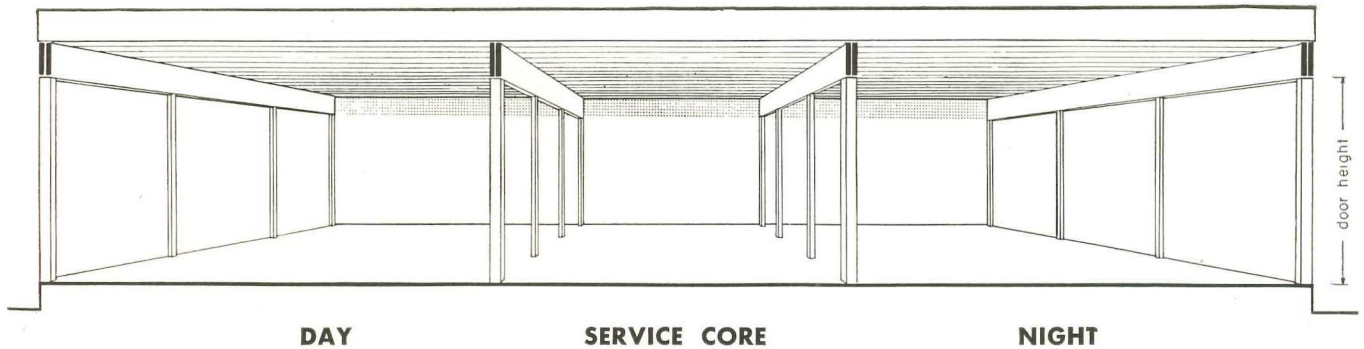
Utility-core plan

Two points make this an unusually good plan: first, it is carefully zoned into daytime, service and nighttime areas—all within a 35' x 45' rectangle; and, second, it was designed for effortless expansion—without structural or other design complications.

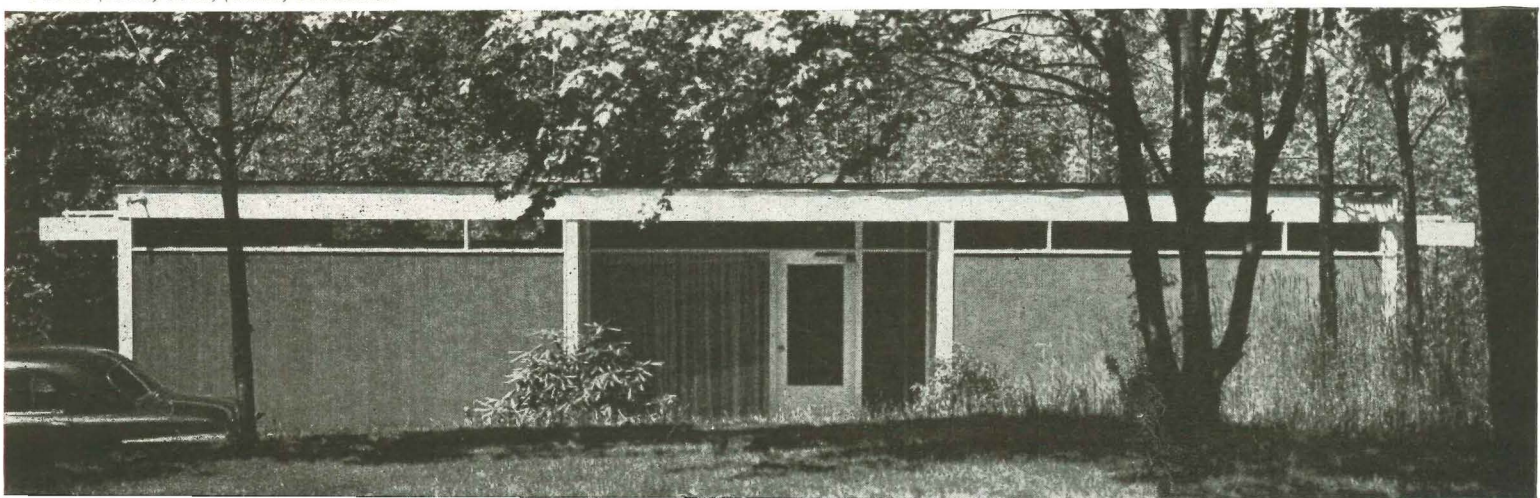
The central utility-core plan is not a new idea, but it is an idea that has found surprisingly few adherents (perhaps because FHA doesn't care for inside bathrooms). The plan avoids long plumbing runs, doesn't waste precious outside walls on bathroom windows, and allows for an effortless separation of study-living-dining areas from bedrooms and playrooms. And the entrance can be located between these two zones.

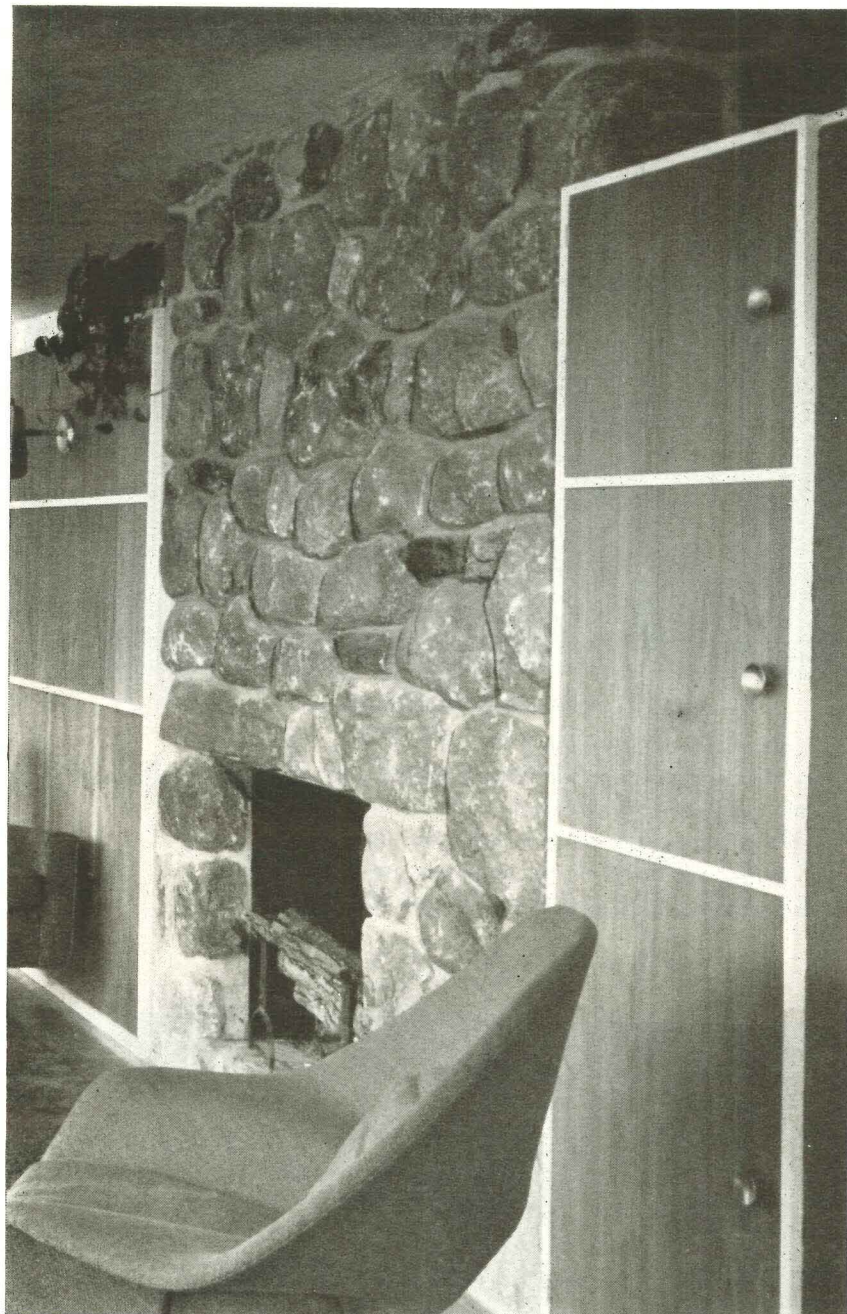
Architect John Johansen has made quite a feature of his entrance lobby—and with great success: its spaciousness (9' x 13') relieves this house of any stigma of minimum living, gives it some of the formality of the traditional New England home. Yet the space is by no means wasted, for the lobby is the main (and almost sole) corridor area.

When this house is expanded to take in a fourth bedroom and to enlarge the living-dining area, the plan will in effect become an H scheme (see Breuer story, H&H, May '52), for in the expanded version there will be a dining and service patio at the west end of the house to balance the formal entrance to the east.



Photos: (below) P. B.; (others) Ben Schnall





View of living-dining area shows Johansen's system of dropped beam construction, with spaces between ends of beams taken up by glass slots. Note that there is continuous trim line under both beams and slots. To see how Johansen avoided "jogs" in this line, turn to details on the next page.

At right, study area and entrance lobby. Dropped beams form entrance archways, close off tops of storage walls.

View at foot of opposite page shows entrance facade. Sun shades project above living and bedroom windows.

Post-and-beam structure

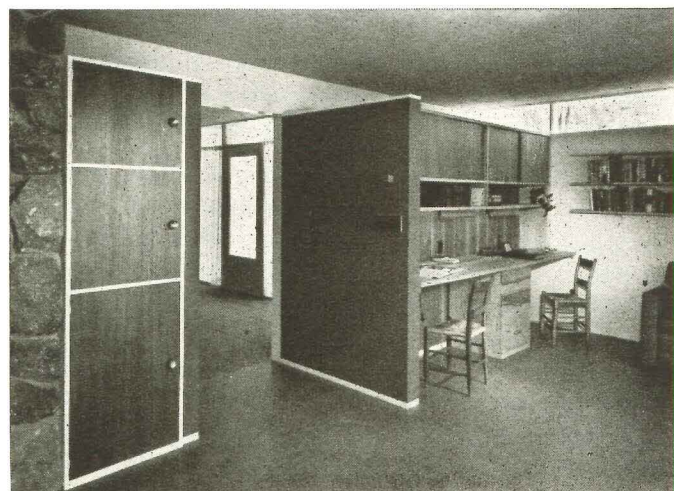
For several years Johansen has been working to perfect a post-and-beam system of construction to conform to the more open spaces in today's interiors and to the bigger glass areas in today's exterior. (See his own house, July issue '51.) The details and construction method he has worked out (described in full on pp. 128-129) should make a contemporary wood house a great deal easier to erect, for this is the kind of universal "housebuilding kit" many have been dreaming about.

But since the kit is an integral part of the post-and-beam concept, it is first necessary to describe the bare structure of the typical Johansen house.

In this one, the structure consists of 16 4 x 4 posts (or their equivalent), all but four of them in the outside wall. The posts are set in four rows and mark off the house into its three plan-zones. They support exposed 4 x 12 beams that run the short way (east-west) and these, in turn, support 2 x 10 joists that are buried in the ceiling and run north-south (see diagram).

Now, the way Johansen handled his joist-over-beam-over-post frame produced three conditions that simplify his structure, plans and elevations:

1. The beams are dropped to the level of door and window heads, thus eliminating costly framing and complicated "fudging" above these openings. Since the dropped beams line up with the divisions in the plan, they help to suggest dividing lines between adjoining and open spaces; and they are also used to close off the tops of free-standing storage walls. Actual ceiling height is 8'- $\frac{3}{8}$ "—which happens to be the same as the AIA-NAHB standard for builders' houses.



2. The nonstructural wall panels between the posts can be knocked out without any trouble whenever the house needs to be expanded.

3. And the fascia around the roof line is a 2' deep wood-and-glass band that holds the house together, visually. Here is how: There is a double-depth fascia on the north and south facades, where the beams are visible. On the east and west sides, however, the depth between 4" wide beam ends is taken up by long slots of glass, which make the ceiling appear to be floating on air, and which give the interiors an illusion of great spaciousness.

Millwork frame

But the most unusual aspect of this house is the millwork frame Johansen has developed for it. This innovation is perhaps as important to easy construction of modern houses as the stud frame was to the economy of more traditional homes. For, by mixing two standard milled sections with his rough lumber, Johansen has produced a universal system that is ready to take all doors, all wall panels, all glass panels and all windows as soon as the structural frame is up. In fact, the carpenters can then all but throw away the blueprints!

In this particular house Johansen was still experimenting with the system, required seven very slightly different milled profiles (all cut out of 2 x 6s) to produce his revolutionary frame. Since that time, however, he has been able to standardize all millwork in his "housebuilding kit" to two profiles, milled out of a 2 x 8 No. 1 common lumber piece.

Here is how the "housebuilding kit" works in practice:

▶ When the floor slab (or platform) is in place, carpenters put down strip "A" all around the periphery of the rough floor—in place of the usual shoe made up of 2 x 4s. This immediately produces: a) exterior bottom trim with a drip and shadow line under the striated plywood panels used on the outside; b) exterior door sills; c) interior baseboards projecting above the finish floor when that is laid.

▶ The 4 x 4 posts, widely spread, are capped by another "A" strip, nailed directly on top of posts but acting as head trim, with 4 x 12 roof beams nailed in turn on top of the trim.

This one strip serves as head trim for all doors, windows, or wall finishes, interior or exterior, and again as sill for strips either of wood fascia (or of glass inserted in the space between ends of roof beams).

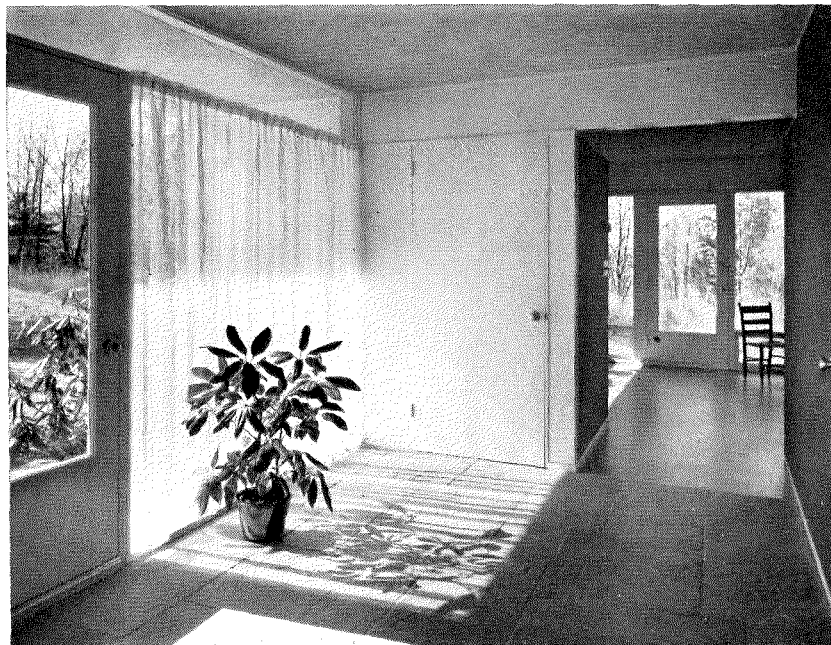
▶ Now the carpenters case all posts from top to bottom with lengths of strip "B" (cutting in window sills of strip "A" where needed). Mullions are built up likewise of strip "B."

▶ The beams are now topped off with joists. Here again the carpenters will insert lengths of trim strip "A" between beams and joists, and thus produce not only a visible dividing line outside between these two structural elements, but also obtain all heads for glass slots between beam ends, and a corner molding all around the plaster ceiling inside.

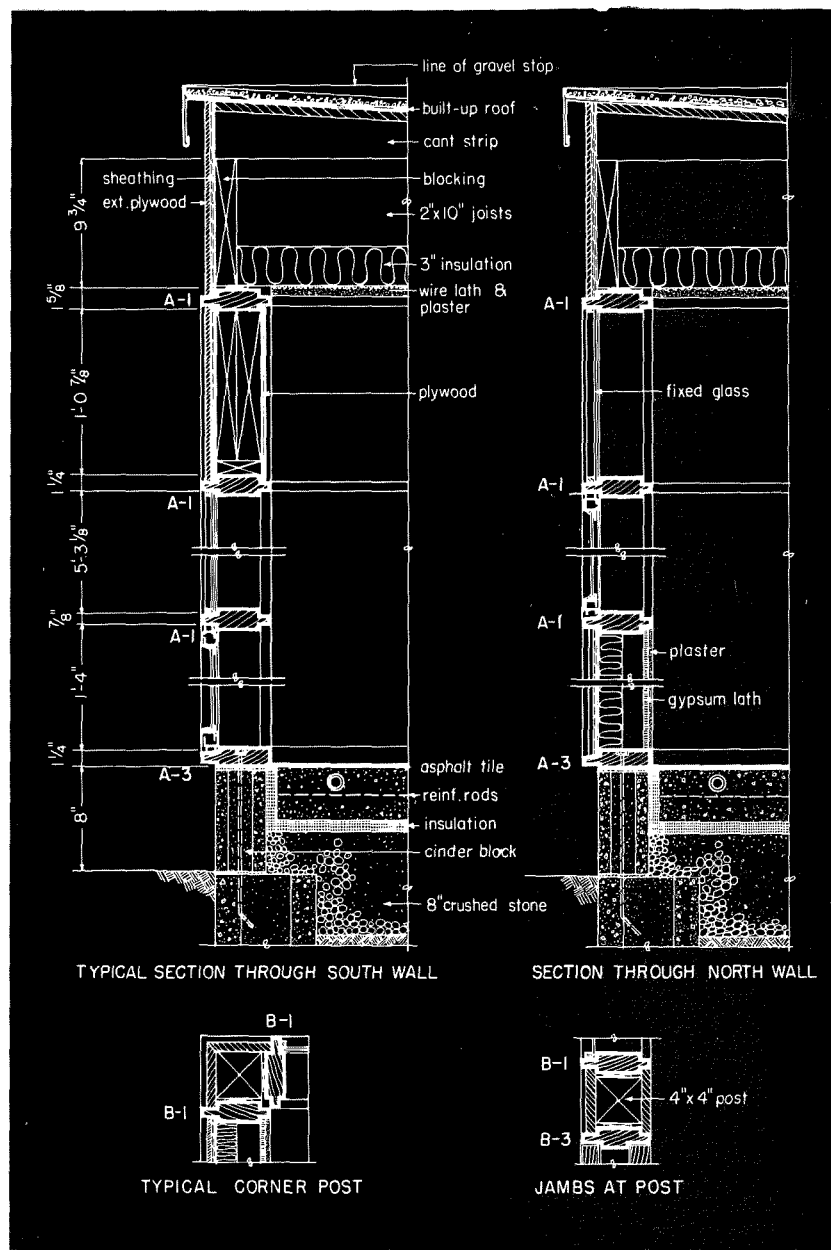
The result of this unorthodox way of mixing rough and milled lumber is impressive: in this house the millwork cost \$675 (including the cost of the No. 1 common lumber) eliminated all plates, some studs, much blocking. It took only 280 man-hours to erect the entire rough-and-finished frame.

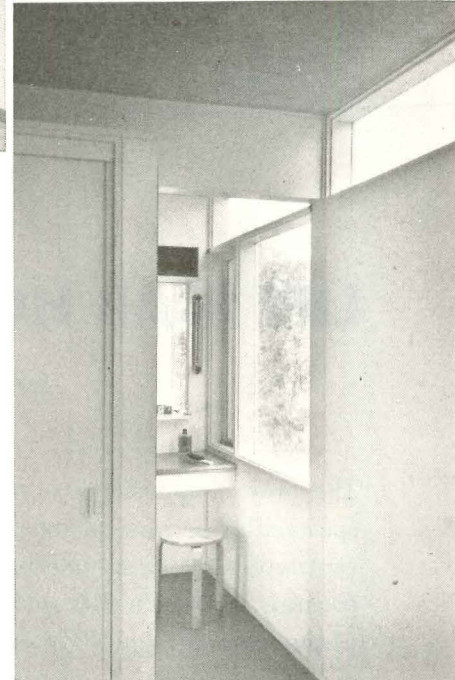
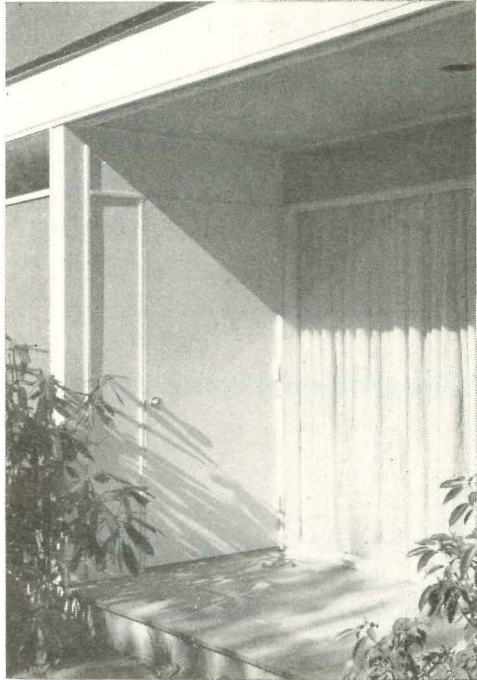
What Johansen has devised, then, is a house modulator—a three-dimensional grid made up of precisely milled sections, into which you can fit all building parts (and even the structure itself) without trouble.

It is too early to say just what the savings in labor will amount to in the end. Already Johansen is building other houses that use the identical detailing system but vary radically in plan. The system should pay off handsomely in large developments of houses that use sheet materials like plywood for all finishes. And if it proves to be as flexible and as economical as Johansen believes, then it should make house architecture a good deal simpler, and the house architect's practice a good deal more profitable.

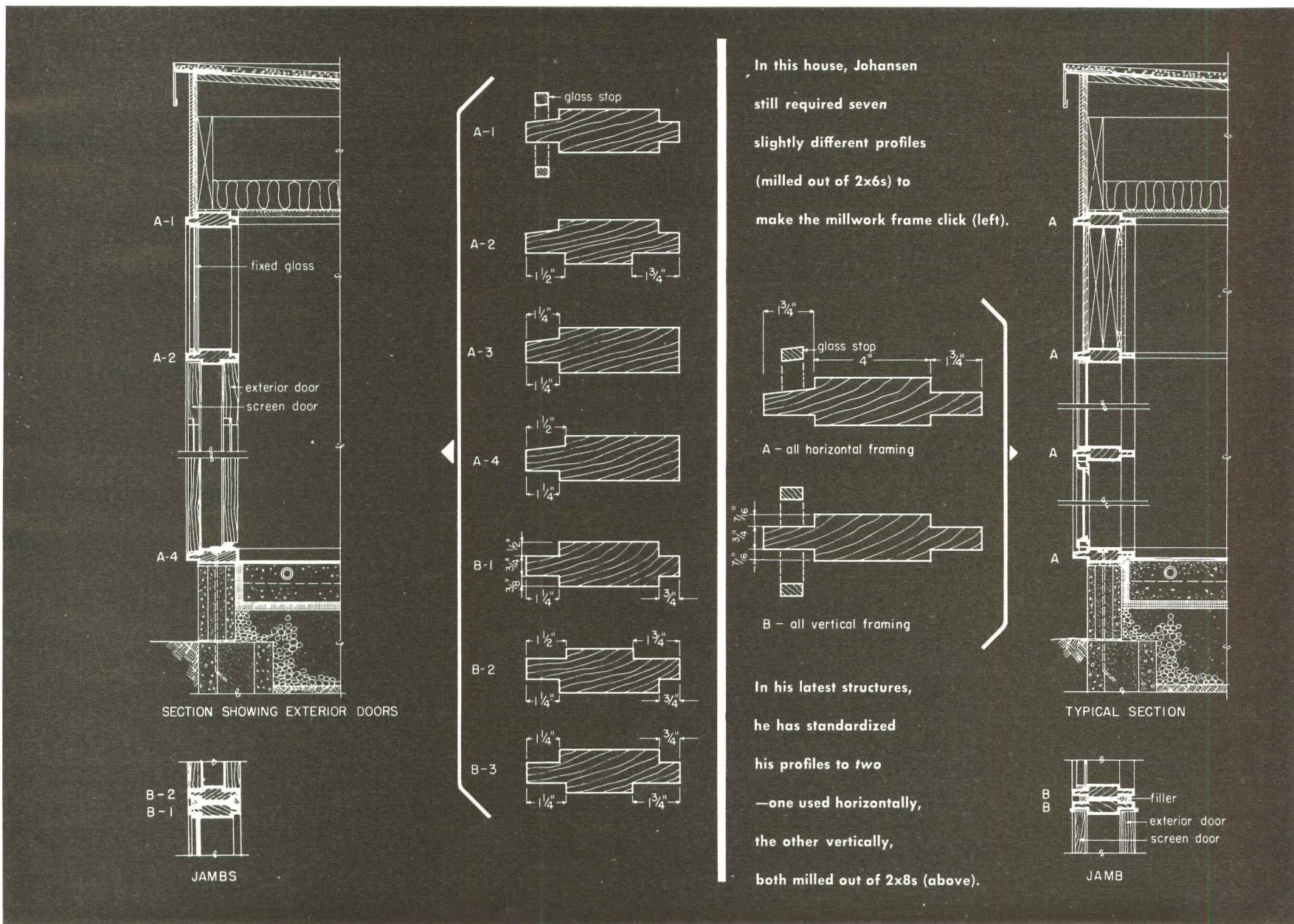


View of formal entrance lobby above shows beams dropped to door height. This avoids costly fudging above door openings, gives interiors an orderly coherence. Picture next right shows main entrance. Dropped beam again tops off door to outdoor closet, and standard trim neatly defines posts, wall panels, glazed openings and doors. Details are shown below.





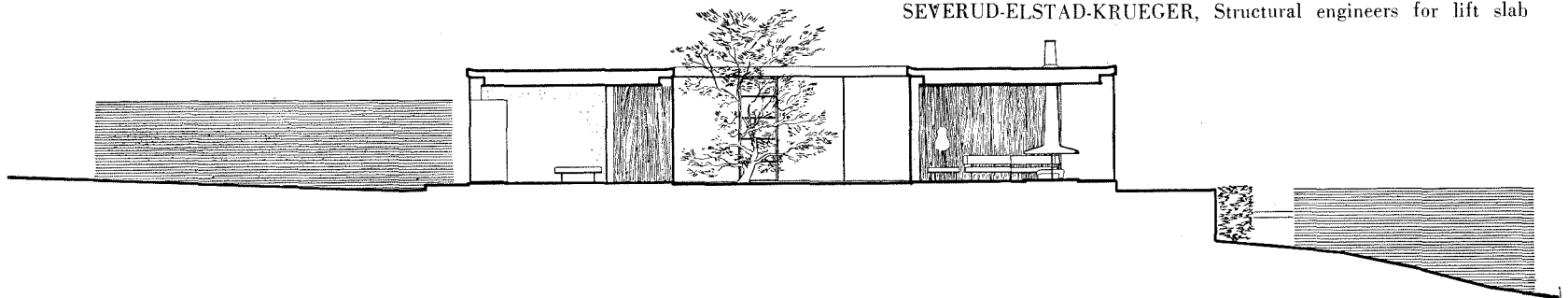
Children's bedroom (above) has large windows under dropped beam, glass slot between ends of beams. Standard millwork trim forms molding around plaster ceiling and heads, jamps and sills. Plywood or other sheet finishes can be neatly fitted into this framework. View into dressing room (right) again shows several typical conditions: e.g., a dropped beam forming an archway and closing off top of storage wall; glass slots between ends of beams; head, jamb and sill conditions solved identically within the millwork frame.



LOCATION: Birmingham, Mich.

WARREN PLATNER, Architect

SEVERUD-ELSTAD-KRUEGER, Structural engineers for lift slab



LIFT SLAB HOUSE: its patio plan shows flexibility of structural system, its detailing points toward a wider use of stock units in precision architecture

The project opposite is a spectacular *tour de force*. It is spectacular because of its all glass exterior, its tremendous cantilevers, its handsome patio plan. It is a *tour de force* because it uses the lift system of hoisting a concrete roof (June '50 and Sept. '51 issues) for the first time in custom-designed residential construction,* and uses it to meet some of the most complicated requirements that the system has ever been called upon to fulfill.

When architect Warren Platner starts jacking up his lift slab over a Michigan lot this fall, he will be testing several ideas that others will watch with interest. Not all these ideas are concerned with structure—although the lift slab notion is the most impressive. (*Picture below shows typical lift slab operation.*) But in addition, he will be building

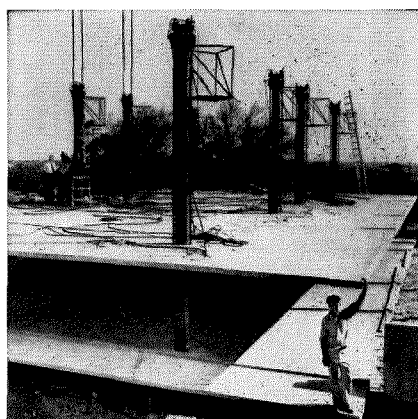
A glass house—with privacy provided by exterior screen walls and clusters of trees;

A patio house—with the inner court developed about as well as it has been done to date;

A house for outdoor living—with new forms and planes used to articulate the site plan; and

A precision house—with stock aluminum windows used in place of the Mies van der Rohe type of expensive, custom-made metalwork.

* First lot of small, identical lift slab houses was built for Henry Street Settlement Camp in New York City in 1948 (Jan. issue '49).



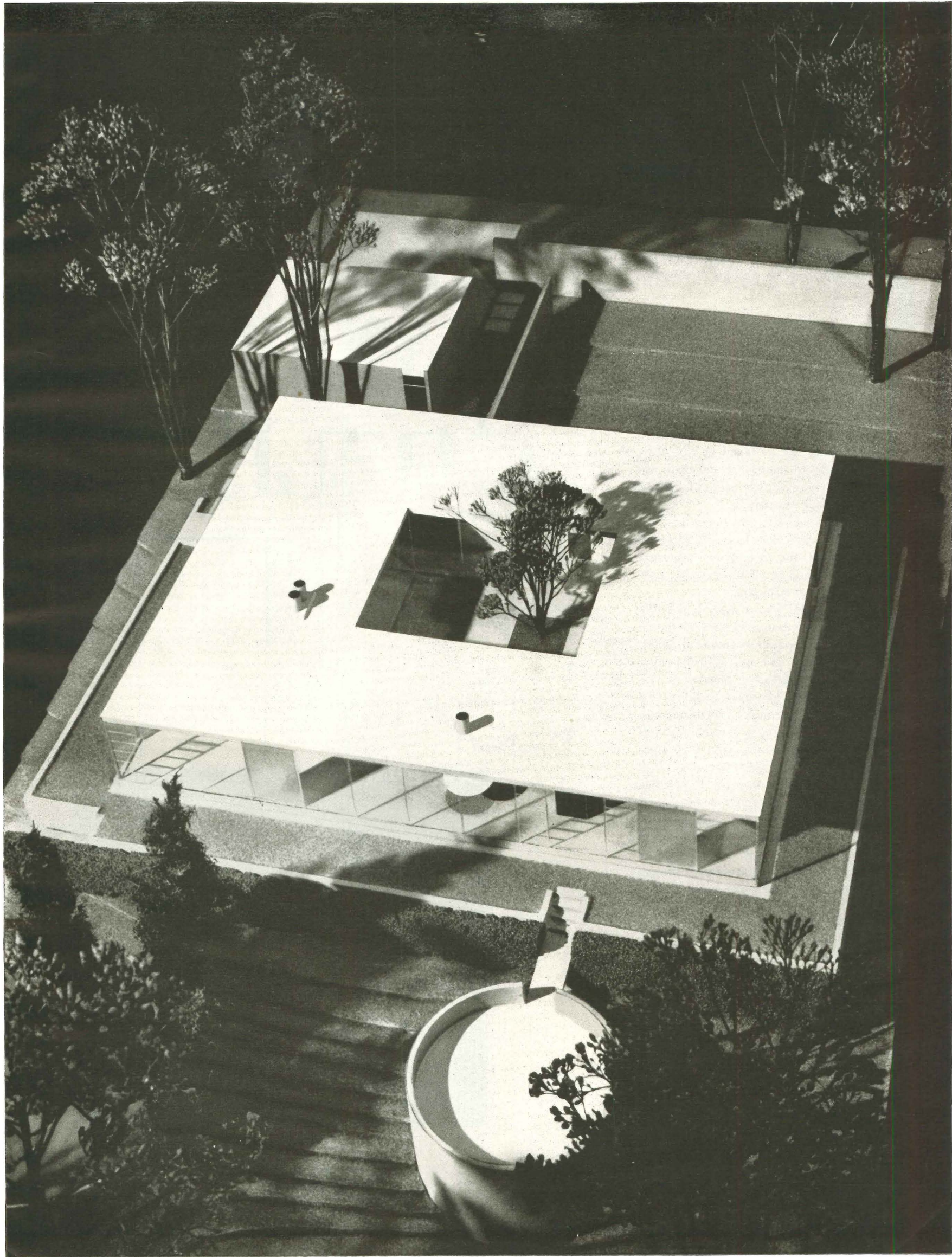
Lift slab structure

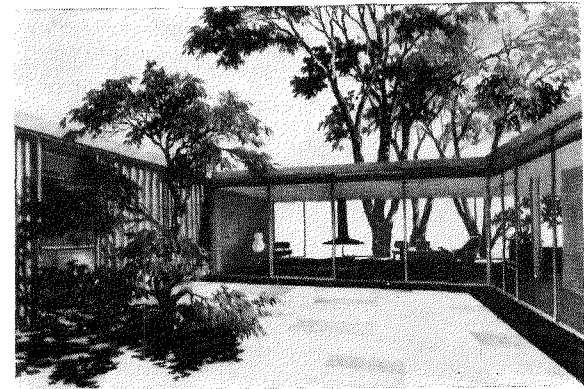
This house has a concrete roof because its owner, John A. Cooper, is a concrete supplier. This makes economic assessment of the job extremely difficult—although experimental structures are always expensive, the owner's special resources helped materially to cut estimated costs.

Platner's plans call for a patio house whose roof will be supported on only four steel columns to keep the plan as open as possible. This means (if you accept the lift slab notion) a complex reinforcing system (including four I-beams) to keep the doughnut roof in shape; it also means four cantilevered corner slabs, each 16'-6" x 12'. The structural design, by engineer Fred Severud, is indicated in the drawings on p. 133.

These drawings show, among other things, that the resulting slab is not flat on the bottom; it has a series of projections determined by the reinforcing patterns and I-beams. Consequently, it will be necessary to pour this particular lift slab into a form (made up, Platner suggests, of reusable cinder blocks and laid out on top of the floor slab proper). Such framework, while less expensive than the traditional type, is still rather complicated, produces an irregular ceiling plane which the architect proposes to cover with a suspended plaster ceiling. (*See section above.*)

He considered several possible alternatives before deciding that the hung ceiling was his best solution. The most obvious: to permit beams and girders to project upwards and out of the roof and thus leave the ceiling flush. Objections to this were that the roof would then have appeared very unsightly from the road (which is on a higher level); moreover, Platner's heating system (radiant pipes with fins) had to be hung in an air space *above* the plaster surface (rather than be embedded in the plaster) so that he needed a hollow space above his ceiling anyway. (This fin-type radiant heating system heats up and cools off faster than the usual, embedded kind.)





View from the patio through transparent living room and towards woods and River Rouge to the south demonstrates glassy lightness of structure.

Patio plan and outdoor living

The excitement of patio houses is three-fold: first, they give the house an extra dimension, for you get an immediate glimpse of the sky a second or two after you have walked in through the main entrance, and you never lose sight of the sky again, wherever you may be.

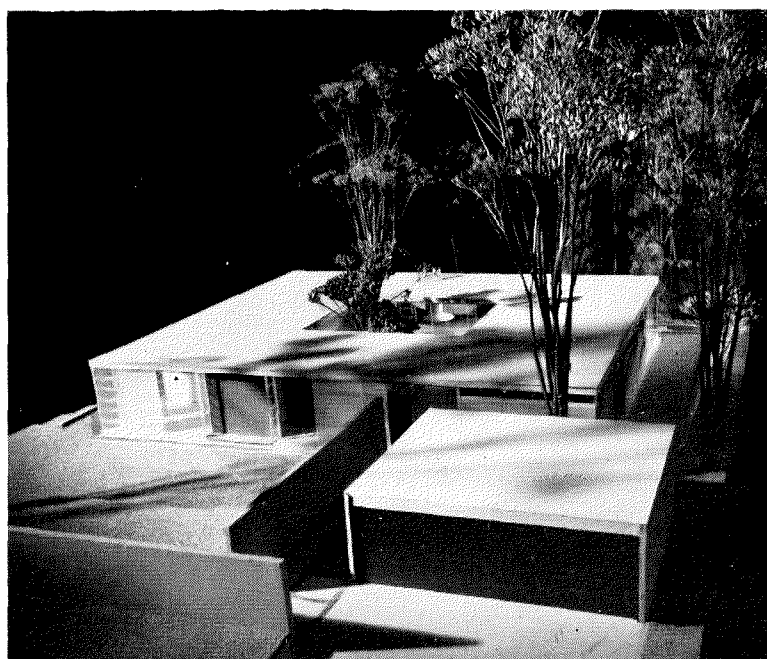
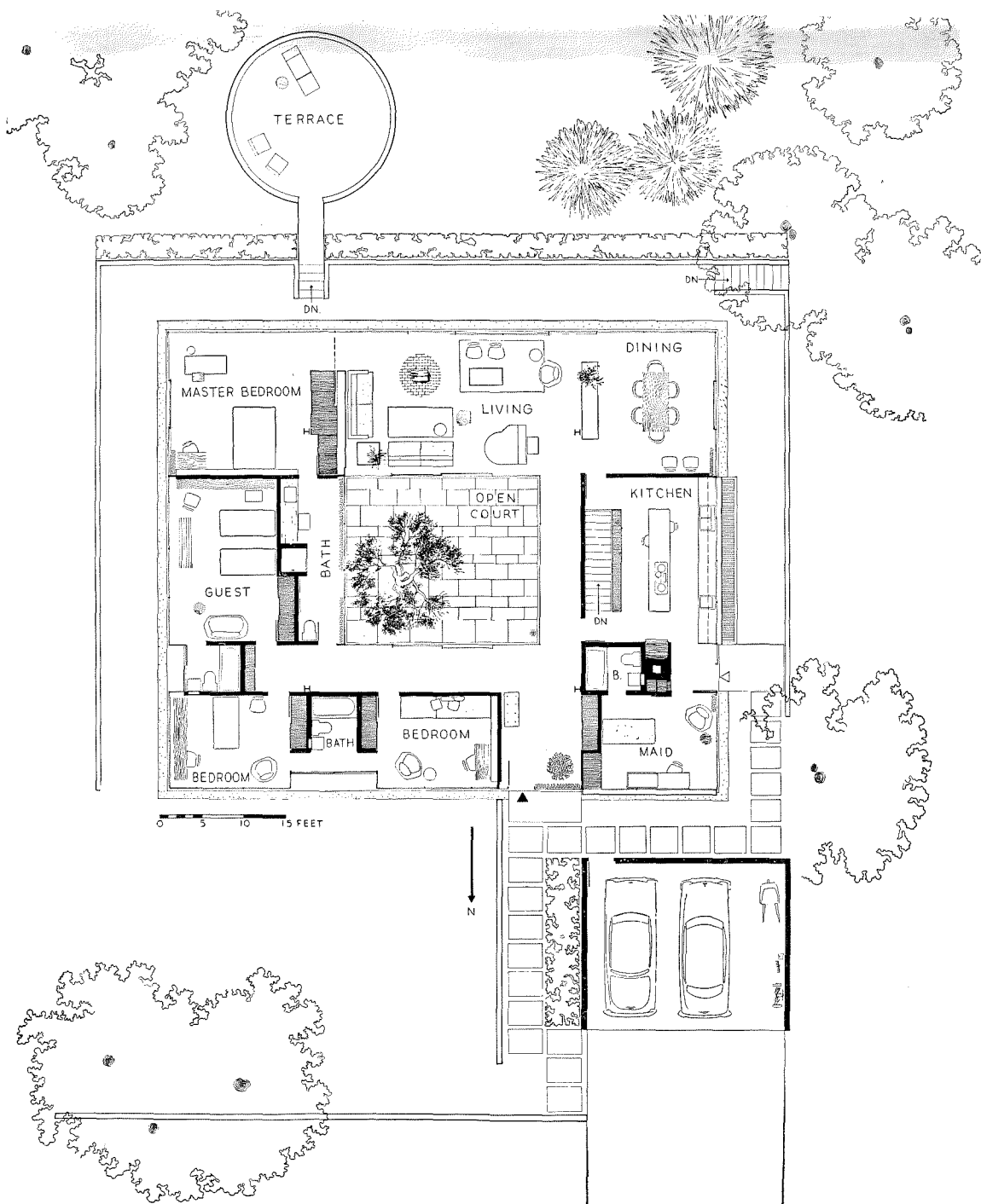
Secondly, they give the house an "interior landscape" that is small in scale, isolated from the neighbors, protected against cold winds, and in charming contrast to the great outdoors.

Finally, central patios make it possible to light many rooms on two sides, eliminate dark passages, separate rooms of different functions easily, and use floor-to-ceiling glass walls without loss of privacy.

Architect Platner's house achieves all these effects with assurance. He manages to do even more: having a screen of woods around his site, he could make his peripheral walls all glass, give some of the bedrooms exterior patios surrounded by high, freestanding walls to protect their privacy. The results of this glassiness are two—the spectacular structure is well expressed in all its cantilevered verve; and the house is quite transparent, from entrance through patio and living room to the woods and the River Rouge beyond.

The architect conceived the house as an island of sophistication in a rural setting. To emphasize this apartness, he placed the house on a little platform of gravel and grass, like a piece of sculpture on a pedestal. (The strip of gravel around the base of the house makes lawn mowing easier since no clipping is needed.)

Platner added a sculptural foil for the large, rectangular form of the house. A few steps down from the pedestal, he placed a cylindrical solarium sufficiently protected to permit undisturbed sun-bathing. Its powerful form juts out of the hillside like some ancient battlement, will contrast strongly with the light grace of the house.



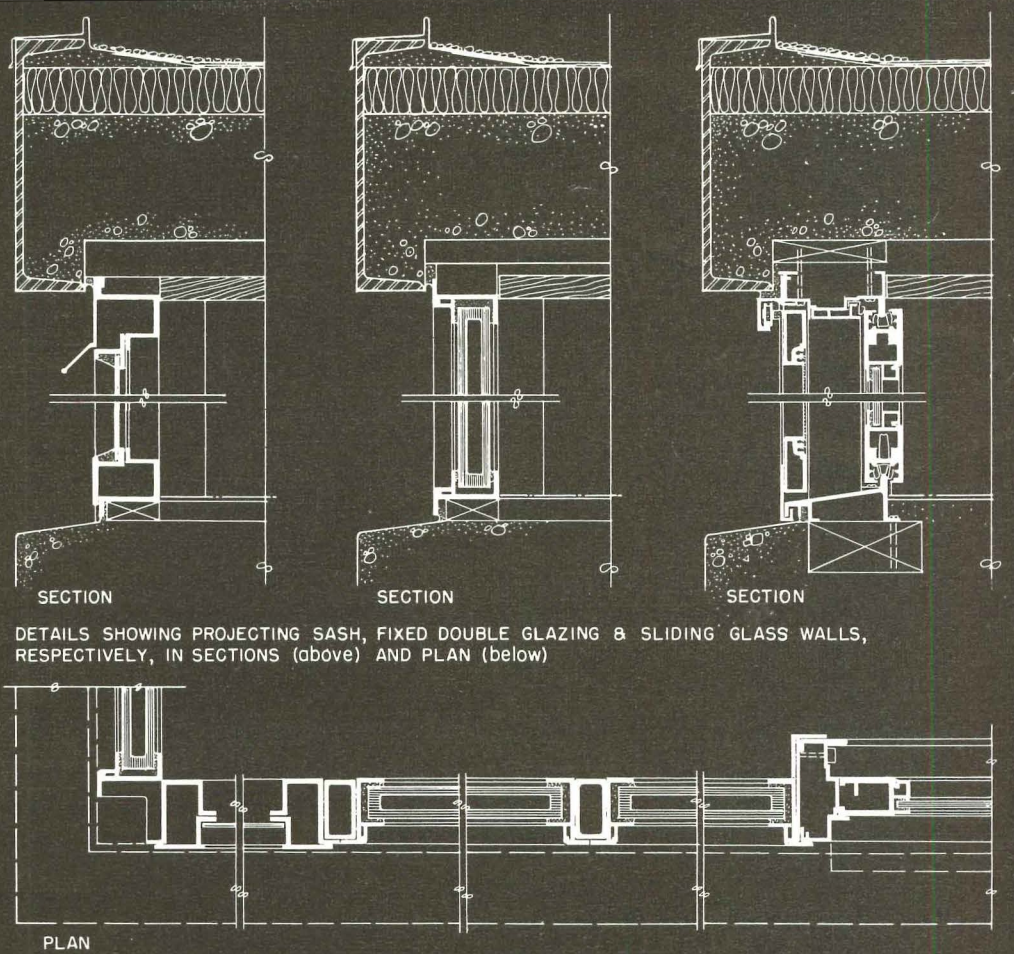
From the road, the house will be virtually hidden by the long screen wall and the two-car garage. Exterior patio at left is part of bedroom area of house.

Stock detailing

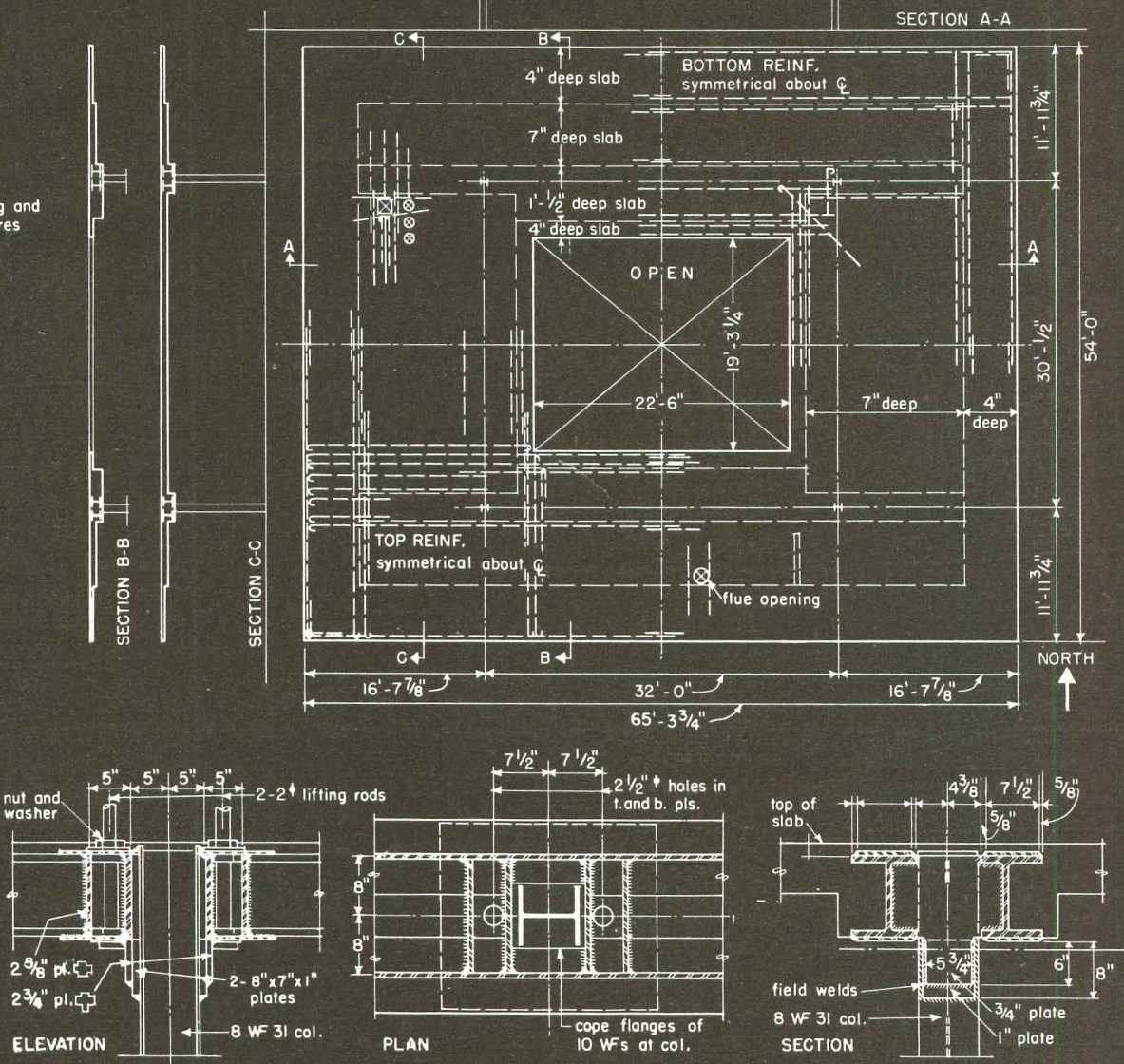
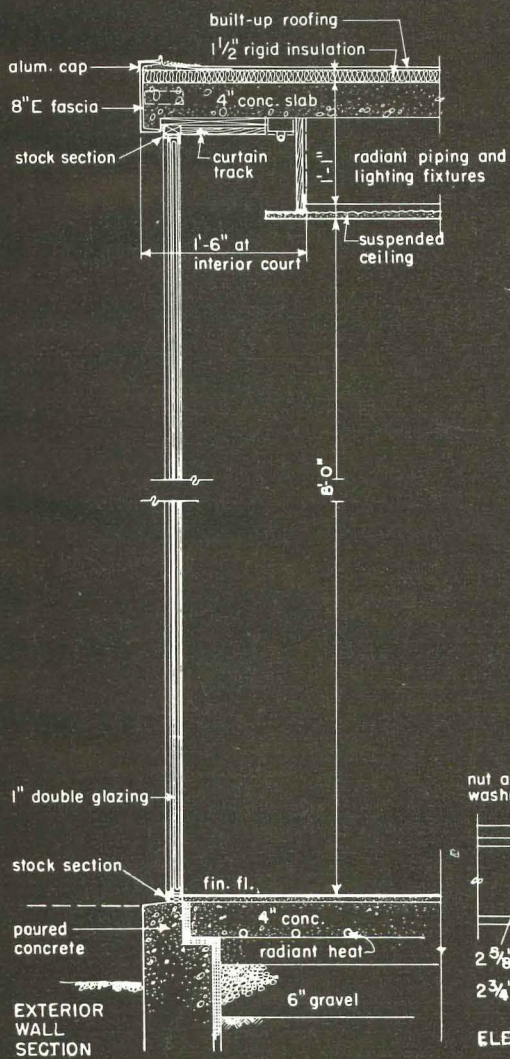
Unlike Mies van der Rohe and Philip Johnson, Platner has been able to evolve a complete detailing system for his glass exterior using nothing but stock aluminum sections: the Florida-type of projected sash, aluminum-framed sliding walls and fixed, double-glazed panels. All of these reach from the concrete floor all the way up to the steel-faced roof line (*see details*).

The wide availability of well designed stock sections is an important recent development, and men like Charles Eames (Sept. issue '50) and Eero Saarinen have taken advantage of it for the past two or three years. Mies and Johnson—whose long-range objective is the greater simplification and standardization of metal parts so that buildings will look more orderly—have tried to achieve such simplicity by polishing their metals as if they were dealing with cabinetwork. Eames, Saarinen and now Platner are trying for a similar objective in a different way: they are using the inexpensive stock materials at hand and—by fitting them into an orderly building system—they are giving US architecture a more effortless coherence.

This house will be a further step in that direction when it is completed next spring; and its many interesting facets will then be presented in their finished form, for all to criticize and appraise.



REINFORCING DIAGRAMS FOR ROOF SLAB (below)



DETAILS OF COLUMN - ROOF SLAB CONNECTIONS

THE NEXT PRESIDENT AND PUBLIC HOUSING

Barring the stalking possibility of a dark horse, the face of the next president of the US appears somewhere in these four pages. Members of the construction industry are bound to feel concern about this man's way of looking at the affairs of their own business. So H&H has searched the records of the would-be candidates from both parties. Considering the great scope and numerous problems of the industry, the search was not particularly fruitful. None of the candidates has expressed himself on the general economics of the industry, or (with the exception of Candidate Kefauver) on such particulars as the future of FHA, the growing importance of military and defense housing, or the relaxation of credit controls. The only phase of building which seems to be politically timely is public housing.

Here is how the candidates stand on that controversial subject:

REPUBLICANS

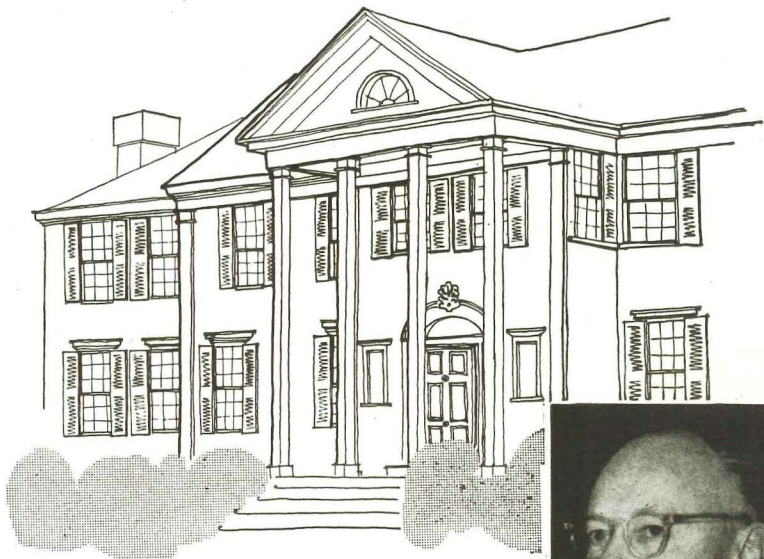
Republican politicians are absorbed in the neck-and-neck contest between General Dwight D. Eisenhower and Senator Robert A. Taft. Generally this is looked upon as a duel between the "liberal" and "conservative" elements of the party. When the spotlight is thrown on the issue of public housing, however, the contest takes on new proportions.

Senator Taft, regarded by many as the true champion of a conservative economic system, has made his reputation chiefly by his cautious approach to federal spending. Nevertheless, he has backed public housing. The Housing Act of 1949 bore his name and could not have passed without his support.

Some industry members, particularly mortgage bankers, explain that the Senator's support was a bit of political gambling, that he endorsed the bill only because he felt it politically expedient and counted heavily on its defeat in the House. (President Truman apparently shares this opinion. He told the National Housing Conference in Washington last month that Taft had turned against the legislation.) Senator Taft himself has defended his belief that federal aid for housing is justified. In a message to the same conference he wrote: "It is no reflection on private industry to say that it never has and probably never will meet the serious low-income problem in the housing field. The general theory that government has a duty to assist the lowest income groups . . . does not involve any departure in principle from that which we have pursued (for) 150 years." But he has indicated a possible retreat from his previous stand by insisting that control of public housing be kept at state and local level. He has further advocated that all "non-defense" government programs (he didn't mention public housing specifically) be "held down."

General Eisenhower has given no specific indications of his views on public housing. If he committed himself in 1949, while the debate was swirling through the halls of Congress (as president of Columbia University he was expressing himself at some length on more general issues), his opinion is not on record. In the absence of clearly expressed opinion, some speculation might be pertinent:

On the one hand General Eisenhower draws his most-publicized support from those "progressive"



Sen. Robert A. Taft's home is a 15-room Greek Revival house on a 60-acre farm near Cincinnati.



Gen. Dwight D. Eisenhower recently bought a Pennsylvania farmhouse near Gettysburg.

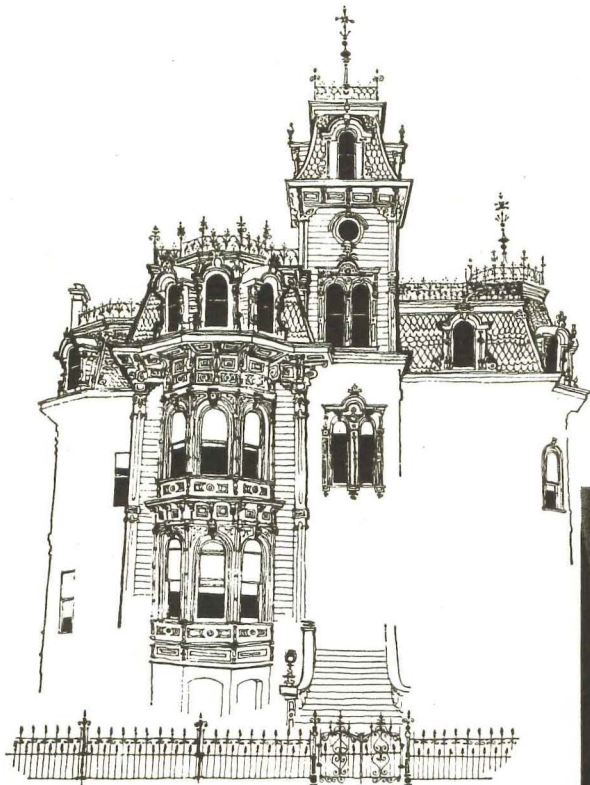


Republicans who have consistently championed public housing legislation. An observer might conclude that they reflect Eisenhower's views on domestic policy.

But none of these backers has attempted to represent the General's opinion on this issue. And there is a not-quite-firm but consistent conviction among many interested observers—particularly the professional public housers—that Eisenhower stands solidly against the concept of housing built with federal funds. Generally this belief is based on his many public condemnations, while he was president of Columbia, of "paternalistic" government and the growing emphasis on "personal security"—such as his 1949 speech in Galveston, Tex. in which he said: "If all Americans want is security, then they can go to prison. They'll have enough to eat, a bed and a roof over their heads. But . . .

we owe it to ourselves to understand the nature of the times and not trade the principles that made this nation great for some panaceas dished out by a bureaucrat sitting in an easy chair in Washington."

Not all Eisenhower's support comes from the public-housing-minded members of his party. W. Walter Williams, who manages his New York headquarters, is a Seattle mortgage banker. He professes no detailed knowledge of the General's views, but he is convinced that Eisenhower's "attitude with respect to sound business principles would be very similar to that possessed by those of us who are actively engaged in the construction and related industries." Another industry member, who has had conversations with Eisenhower in the past, brings up the point that General Eisenhower has shown an opposition to subsidies of any kind.



Earl Warren lives in the California gubernatorial Steamboat Gothic mansion at Sacramento.

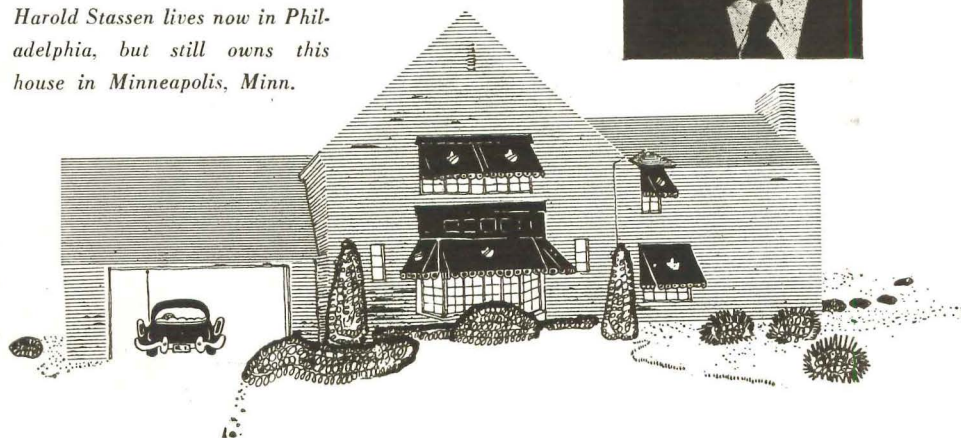


Governor Earl Warren of California advocates public housing as a "last resort." He supported the present public housing bill "with minor modifications." More recently, he has urged the Republican party to hold to its 1948 platform, with its recommendation for federal housing aid "where necessary." Warren's own state, which enjoys a reputation of living under a balanced budget, has no state public housing authority, but under the governor's leadership it has established two postwar state-financed housing programs. One provides a revolving fund with which cities and counties can set up temporary housing facilities for veterans. The other permits the state to purchase surplus federal housing units from abandoned war centers and re-sell them to veterans and farmers.

Harold Stassen has made no pronouncement on public housing in his current campaign, presumably sticking to the views he expressed in the 1948 race. Then he declared himself in favor of public housing, but was opposed to any program in which the federal government would be the "landlord."

At that time he called also for governmental help in "modernizing the building industry," such as "backing for architectural and engineering advances in design and production." He thought the government should take the lead in "lifting restrictive practices of some unions, and ending combinations of some material men and contractors, which together have prevented progress in housing comparable to progress in mass production."

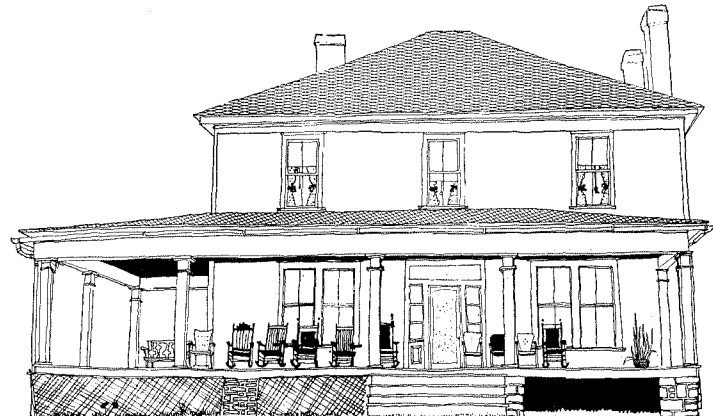
Harold Stassen lives now in Philadelphia, but still owns this house in Minneapolis, Minn.



THE NEXT PRESIDENT



Sen. Estes Kefauver grew up in this porticoed old house in Madisonville, Tenn.



Sen. Richard B. Russell's family homestead is a farm in Russell, Ga., a small settlement (pop. 150) near Atlanta.



Senator **Richard B. Russell**, the Southern Democrats' choice, is a deviationist from administration policies on civil rights, but has been a "regular" Democrat on many other matters—including public housing. Alabama Senator John J. Sparkman, who did much of the rear-guard committee fighting to get a public housing bill passed, backs Russell, noting that the Georgia Senator's "progressive" record includes support of public housing. Russell, however, bases part of his campaign on the need for "strict economy" in government.

Photos: Harris & Ewing; Acme Photo; Mike Shea; J. G. Zimmerman; Associated Press Photo; International News Photos.

DEMOCRATS

Senator **Estes Kefauver**, whose supporters include Nathan Straus, long-time advocate of public housing and the first administrator of the USHA, believes that "it is not possible to meet the problem of housing for low income groups without direct federal aid." Senator Kefauver told H&H last month that the Housing Act of 1949 is "not wholly adequate, although it represents a long stride in the right direction."

The "chief modification" which the Senator believes is required of the Act is a provision for "extension of additional aid for co-operative housing to meet the needs of middle-income groups." This aid, he says, "need not be in the form of direct subsidy but in the form of guidance, encouragement and technical assistance."

In general, Senator Kefauver believes that the construction of public housing should be left to the localities. He offers one possible "exception" to this rule, however: "the construction of family-type housing for military personnel." He says: "Certainly the housing provided today for military personnel cannot be regarded, in many communities, as satisfactory. I believe that the matter is one which requires attention by the federal government—and a determination to raise standards of such housing as promptly as possible. Obviously, substantial modification of the Wherry Act program is indicated by its failure to achieve its avowed purpose."

Senator Kefauver also believes that government aid should be extended "toward the construction of so-called defense housing according to the same principles as all forms of government aid to housing." The government's emphasis, he says, "should be on the provision of housing of a character that will constitute not new slums, but permanent community assets." Emphasis should also be placed "on rental housing, rather than on the construction of homes for sale." "Careful studies" show that "veterans and others with families of uncertain future size and jobs of uncertain tenure would much prefer to rent. But more than 75% of the housing now being built is for sale. Government policy should be directed toward giving people a free choice—which in many communities, because of mistaken government policies of aiding chiefly speculative builders of small houses for sale, is denied them today."

The Senator expanded his criticism of government "aid" to speculative builders by declaring himself in favor of a "reorganization of the FHA to make it what it was originally intended to be, a government agency for the protection of home purchasers, instead of what it has become, a government agency to provide government-guaranteed loans for the construction of housing which yields fantastic profits to speculative builders."

Illinois' Governor **Adlai Stevenson** is a "draft" possibility, not an active contender for the nomination; consequently, he has taken no campaign stand on any issue. Such stands must be found in his gubernatorial record.

In August '51 Stevenson vetoed a bill passed by the state's general assembly which would have required a majority of voters of any Chicago ward to approve by referendum any proposed public housing project within that ward. Said Stevenson in his veto message: the bill "would enable an interested minority to organize the opposition of those who might be fearful of—or inconvenienced by—a proposed housing project, thereby blocking an improvement which would benefit the entire community."

Stevenson called the Housing Act of 1949 a "great opportunity to correct many of the worst conditions throughout the country . . ." Noting objections to the act, from builders he said: "You don't have to approve the principle of public housing or the idea of government subsidies for some at the expense of everyone to recognize that without public housing it is generally conceded that only a limited and unsatisfactory answer to the slum problem can be expected." However, he admitted, "the new federal Act, or any government subsidy, can never be the whole answer—the housing deficiency can only be met in the final analysis by all-out private building."

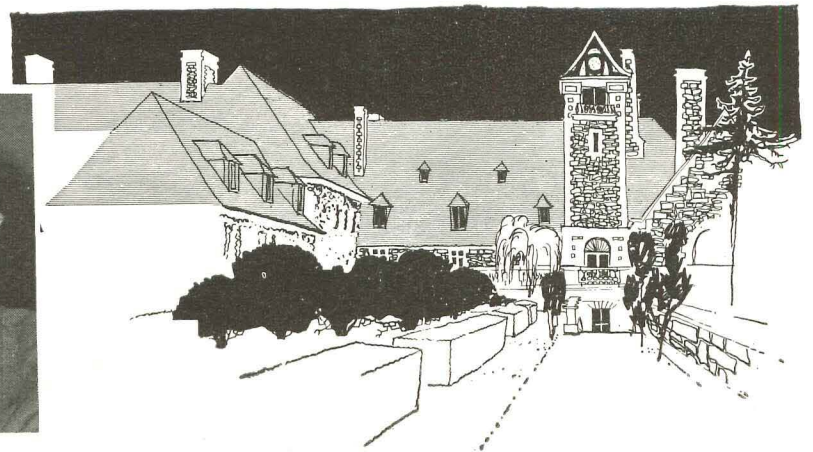
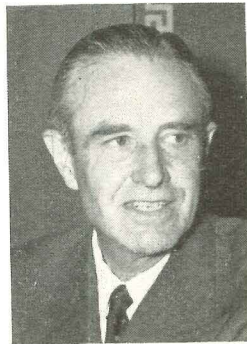


Adlai Stevenson lives in Illinois' stately governor's mansion in Springfield

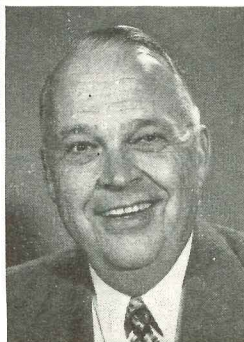
Averell Harriman donated Arden House, the family mansion in upstate New York, to Columbia University.



Sen. Brien McMahon, whose Connecticut home is not pictured here.



Sen. Robert S. Kerr was born in a log cabin; now, an oil millionaire, he lives in a mansion in Oklahoma City.



Senators **Robert S. Kerr** and **Brien McMahon** are "Truman men." They voted with the Administration on the Housing Act as they have on most other matters. **W. Averell Harriman**, who many believe is the man with the presidential nod, told a convention of public housers last month: "The attempts . . . to virtually eliminate the provision of low-rent public housing for low-income families now living in slums must be vigorously opposed." Harriman also sounded what he called the "great new challenge in the field of housing" for the years ahead: ". . . We shall need to consider how we can best meet the needs of the people of moderate means—the people who have no need for public housing, but cannot pay the high cost of so much of the private housing being built today. We must find ways and means of bringing the prices of good housing down to levels they can afford."

CUSTOM-SPECULATORS—builder and architect successfully introduce modern houses into a stronghold of conservatism



Mature trees were saved wherever possible, as were clumps of young dogwood and birch. Long curving driveways, made necessary by the deep setbacks of the houses (see plan) are provided by the builder.

LOCATION: Media, Pa.
GEORGE HAY, Architect and Land Planner
ARTERS BROS., INC., Builder

This story is all the better because it comes from Philadelphia, stronghold of traditionalism. It's the story of how a young builder, with a young architect, doubled his sales by:

1. Switching to contemporary architecture, though everyone told him that the area demanded "colonial."
2. Putting all his houses on well planned, \$2,700 half-acre lots, though everyone told him that his land costs were out of line.
3. Offering his customers their choice of extras and changes—at a price—though everyone told him he would lose money doing it.

What's good enough for my father

Architect George Hay and builder Wallace E. (Bud) Arters could hardly have picked a tougher place to build their ranch house subdivision than Media. Just southwest of Philadelphia, the area has clung tenaciously to stone and brick colonial and Cape Cod houses, and a one-floor design was hooted at as a sales "monster." Builders and brokers alike mournfully warned that "Media isn't ready for new designs." But the young (Hay, 32, Arters, 35) team decided to go ahead after Arters said: "Everyone can't be out of step but Media!"

These were the goals:

- ▶ Development of a complete, one-character residential area
- ▶ Thought-out land planning, with largest possible lots
- ▶ A minimum of basic house plans with a maximum of changes permitted to the buyers.

Costly land doubles house values

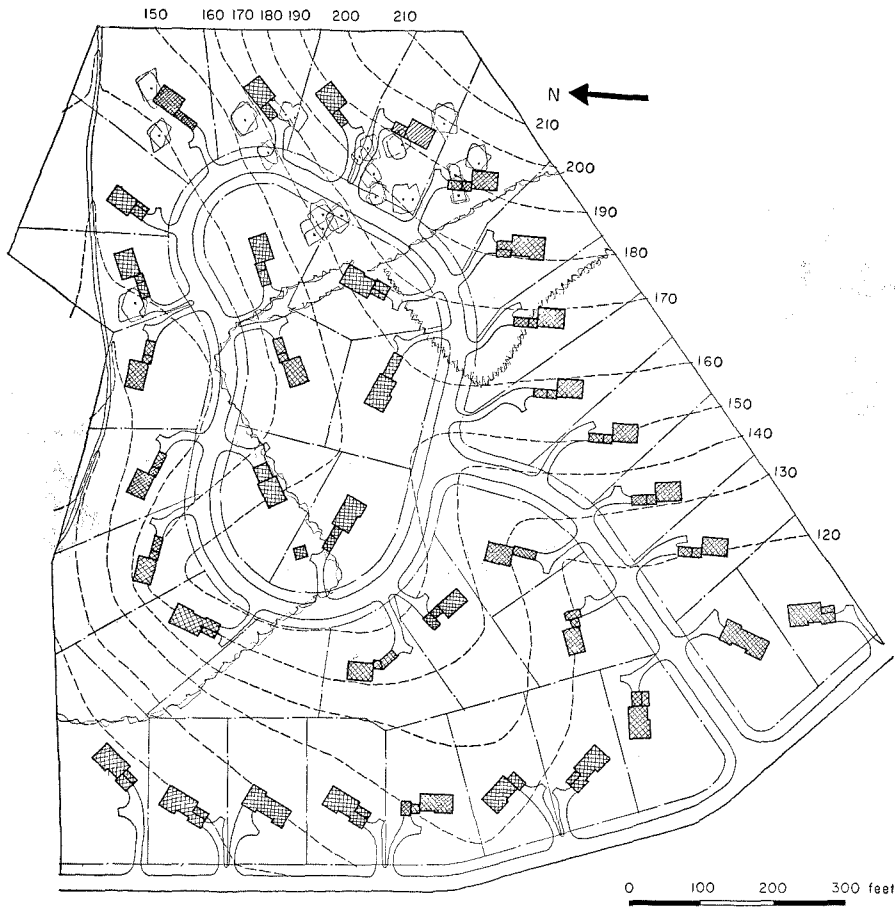
Because he was to do the land planning, the architect was given a hand in choosing the site, selected a 24-acre tract of partly overgrown meadow with scattered stands of hardwood and pine which sloped up 135' from a road along the westerly edge. The entire acreage has an excellent protected view across the valley to the hills several miles to the west and northwest.

The demands of the county and township planning commissions added to the site problems (no road grades above 10°, 100' frontage for each lot). Siting of houses for best use involved extra-long driveways. All this makes for expensive land (\$2,700 per lot before footings were poured), ordinarily out of proportion for houses in the \$15,000-\$19,000 range. But builder Arters says:

"The extra thousand dollars or so in each of these sites makes it possible for the owners of our \$15,000-\$19,000 houses to live in a \$30,000 style. The half-acre of land, the sweeping views, the privacy—all add up to a way of life our customers want, but can seldom find in their price bracket. If I take all this away, another \$1,000 added to the house itself won't replace it."

Make the houses fit the land

Hay passed up any solar exposure scheme for siting the houses on the land in favor of a "lariat" plan that took best advantage of contours, existing trees and views. By angling the houses with the contours, the view from within them was enabled to go past, between or over neighboring dwellings. In most cases only a few



"Lariat" plan follows site contours. Provident bachelor Hay held back one lot for himself

of the 37 houses are visible from any one location at one time.

Two basic houses comprise the whole development: a one-floor three-bedroom "rancher" and the two-bedroom expansion attic bungalow. Rather than freeze the design, the builder offered buyers a wide list of changes available at specified costs which could be made while the houses were under construction. All changes were under the supervision of the architect, for which he charged an extra fee. When customers wanted ideas of their own incorporated, Hay could quickly work out the details.

Changes à la carte

Customers jumped at the chance to add their own ideas. Extra costs varied from nothing to over \$3,000, averaging \$700. One buyer who wanted two bedrooms and a bath on the second floor ran the cost of his house up to \$22,000. With basic costs between \$14,900 (bungalow) and \$18,900, the houses averaged \$17,275 with changes. Architect Hay explains the company's willingness to make changes to suit individual desires:

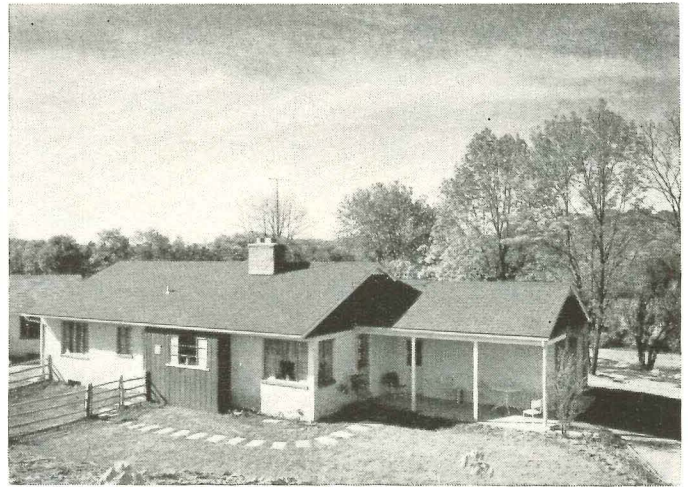
"We know that it costs money to make changes from the original plans, but in this price class we are dealing with people who are willing to pay for, and who demand, alterations. We have been told by several of our buyers that they had planned to build their own houses before they saw ours. Arters Bros., Inc. have become custom-speculators!"

Photos: Cortlandt V. D. Hubbard





Ground cover, rather than grass, will be used on steep slopes (left) to anchor soil. Fears of erosion were minimized when five-day rain early this spring did only negligible damage to unseeded, raw slopes.



Flagstone walks are easily fixed if soil settles

Many items, long familiar to other housebuilding areas, caught Media's eye. Among them: floor-to-ceiling living room windows, shuttered pass-throughs from kitchen to dining room, two-way corner fireplaces and carports with extra storage space.

Land planning saves money

The builder estimates that on land planning alone, the architect saved him more than the entire cost of his fees. Taking advantage of every natural contour reduced earth moving to a minimum, and rolling Pennsylvania land teaches builders early that the less you use the bulldozer, the less trouble you invite from having upset the natural drainage. Where one awkward site lifted a house high out of the ground, Hay took advantage of this to put a game room and carport into the basement level, which added a premium to the sales price.

Builder loves architect, architect loves builder

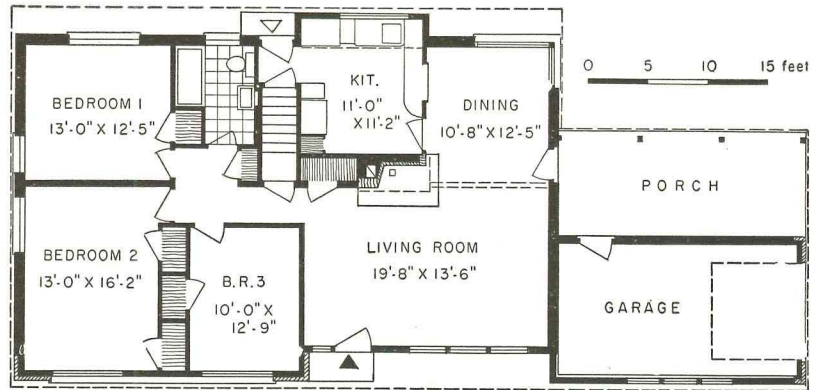
In this builder-architect duo both have benefited from their association. Though Arters has been a builder for 16 years, he had never built more than 23 houses in one year (1950-'51), but 1951-'52 saw the completion of the 37 in this project, plus seven others. And his houses are beginning to make him a reputation.

"I have heard people say, 'This looks like an Arters house,' or 'Arters is that ranch house builder.' That never happened to me while I was building the colonials."

For George Hay, the project has meant:

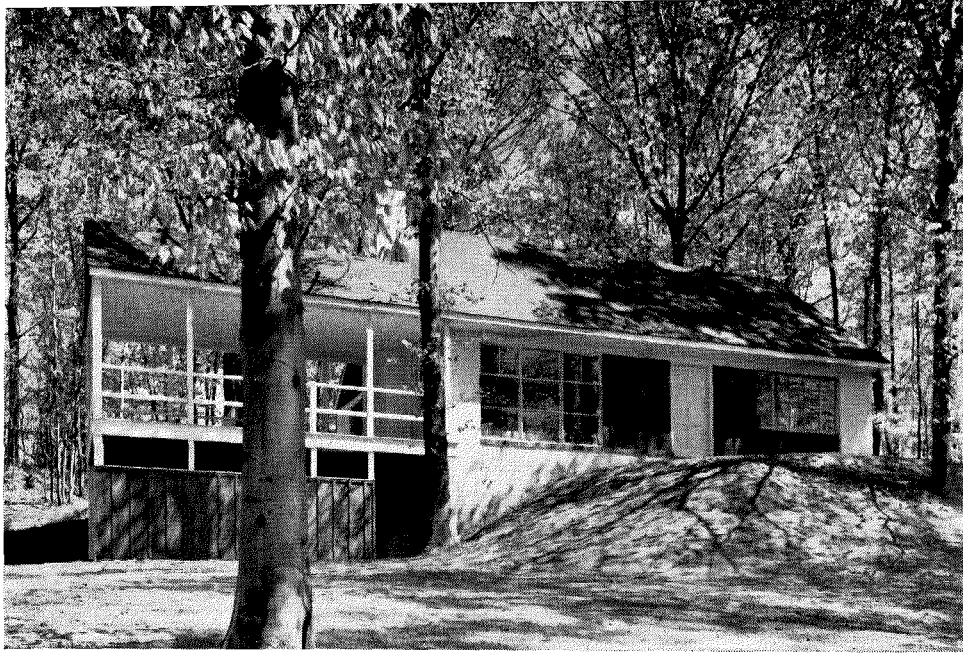
1. The establishment of a "key" account around which to build a sound, diversified practice
2. The opportunity to promote design standards in a community heretofore reluctant to change
3. An increase in both custom commissions and builder work.

With the present project nearing completion, the team is ready to move into their next, Hunt Club Hill. On 59 acres of similar hillside, Arters is going to build 49 houses in the same \$15,000-\$19,000 price class, with a heavy emphasis on the one-floor "rancher." If suitable less expensive land can be found, he wants to try to hit the \$12,000 market with a three-bedroom slab house with perimeter heat. Some areas nearby forbid slab construction and code changes may be necessary, but both builder and architect are sure that their future lies with better and better contemporary houses.

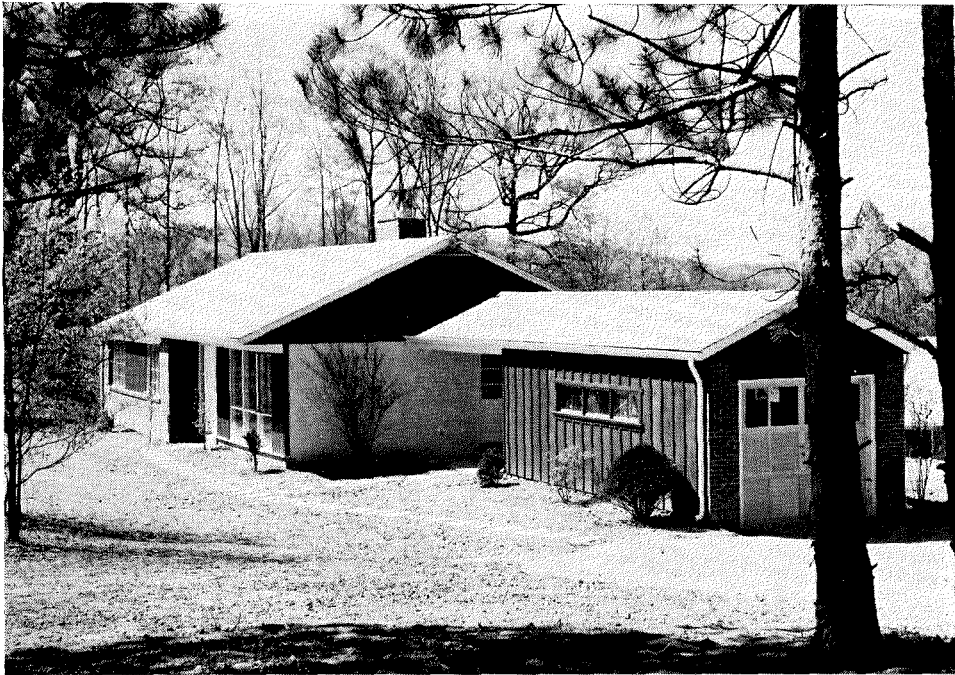


Floor-to-ceiling fenestration is striking contrast to area's usual small-paned windows. Pennsylvanians like wallpaper, but newcomers prefer painted walls.



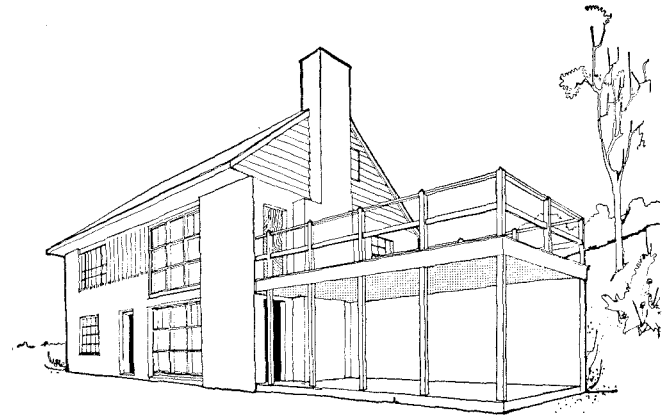
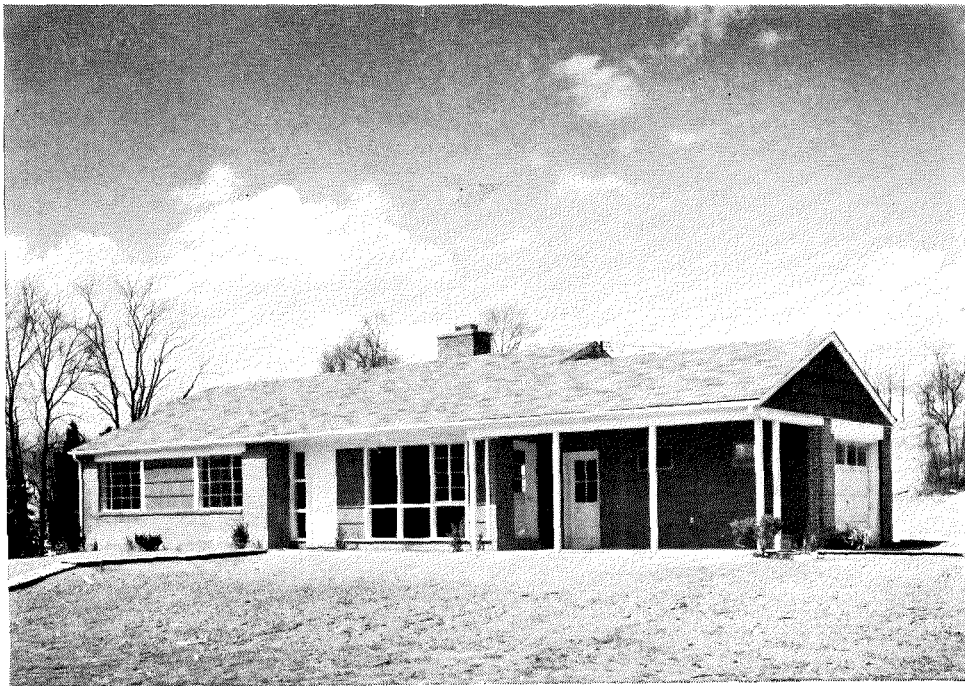


Rise in ground permitted the building of carport and sun porch at little extra cost. All houses have full basements.



Redwood siding was to have been stained various colors, but customers all demanded the same light red shade.

Other builders, regular visitors to project, were impressed with the public's acceptance of one-story design below.

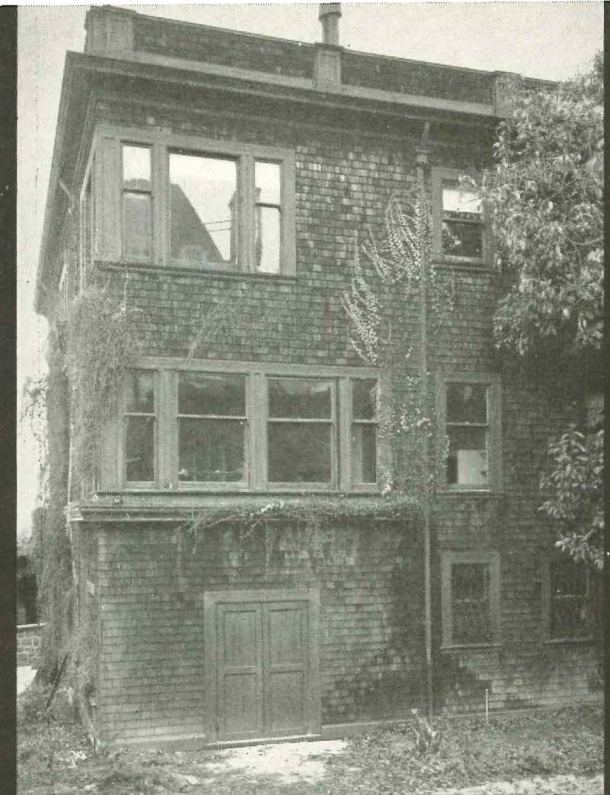


Awkward site was turned into an asset through addition of game room and carport at basement level. Hill and trees immediately behind the house help to minimize height of front elevation, which is a full story higher than other houses.

Cost breakdown

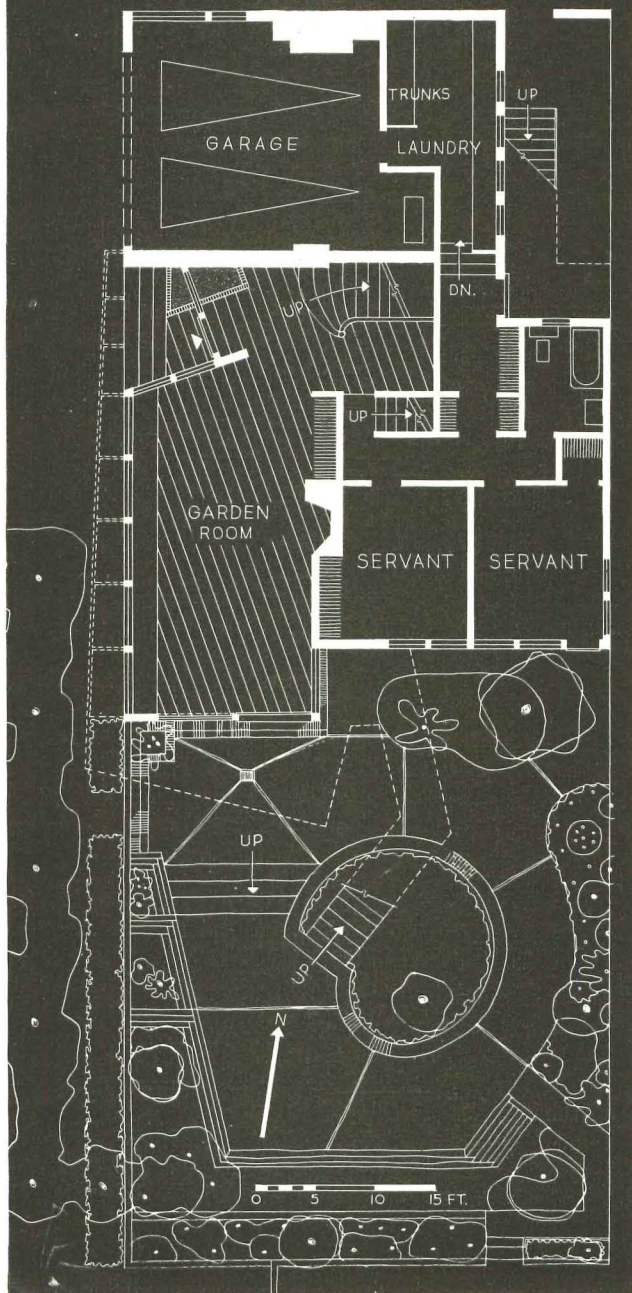
Land, water, streets, extra grading....	\$2,700
Excavating, backfill, planting.....	402
Footings & cement work.....	613
Lumber, millwork, insulation.....	3,053
Masonry	2,017
Carpentry & labor	1,876
Plastering & stucco	776
Heating	810
Plumbing, incl. cesspools & water heater	871
Electrical work incl. fixtures	330
Rough & finish hardware, medicine cabinet	162
Steel	136
Hardwood flooring	332
Tile work, kitchen & bath.....	299
Painting, papering & glazing.....	533
Drives & walks.....	415
State & local taxes.....	378
Equipment, range, kitchen cabinets, washer, snack bar	871
Architect, engineer, permits, financing, sales & misc.	686
Profit	1,640
Total	\$18,900





Old overgrown vacant lot on south side of house (above) gave way to a new fenced and landscaped garden (left) with stairs leading down from dining deck to play area.

The new ground floor plan (below) boasts new garage, service stair, multipurpose "garden room."



LOCATION: San Francisco

CLARK & BEUTLER, Architects

THOMAS D. CHURCH, Landscape Architect

BETH ARMSTRONG, Interiors

A. F. MATTOCK & CO., Contractors

RAZE, REMODEL... OR REBUILD?

A case study: how to save a white elephant

of a house—and several thousand dollars

The tendency to judge a house by its looks almost proved the death of this 50-year-old San Francisco mansion. Like an aging auto, its sound chassis had outlived its more visible exterior parts, and it was about to be turned in on next year's model. But with houses getting smaller and prices bigger, its generous space was obviously a bargain hard to duplicate in a new building.

So architects and owners answered the raze-or-remodel question handsomely by doing some of both—tearing the structure apart without tearing it down. When the bills came in, this major surgery proved far cheaper than mercy killing: the total renovation (\$9 per sq. ft.) cost less than two-thirds the cost of comparable new construction (\$14-\$16 at the time in the area).

The property the owners had bought was highly desirable: a big, three-story shingle house that had weathered the 1906 earthquake without a crack, built on a 50' x 100' lot; a blue-chip residential location on Pacific Heights; an unimpeded view over tree-lined park land to the Golden Gate.

The old house, however, had an inflexible plan common to its day, boxy rooms and small windows that denied occupants the full sweep of the panorama. It lacked a garage, and the first-floor kitchen and dining area were far removed from the second-floor living room. An adjacent open plot had deteriorated into a drab tangle of weeds and rubbish.

The problem was to provide, through either renovation or new construction, a place suitable for contemporary living for a young executive, his wife, son and daughter and two servants.

The new solution preserves the graceful formality of the old house without its many inconveniences. It has been completely opened on the interior so that space flows easily from one room to the next, from inside to outside through balconies and bands of plate glass that bring in sun, view and the new landscaping of a private garden in the once derelict lot.

On first appraisal, the owners had been inclined to agree with friends who urged them to tear down the old relic and start over again. But closer inspection revealed that the house, of an era when buildings were built to last, still had remarkably strong bones: studs as stout as 3" x 6" on lower floors, 4" x 14" floor timber over the wider ceiling spans. The architects recommended remodeling on the basis of obvious economy, the proved durability of the structure, and the possibility of adapting the existing layout to their clients' specific requirements.

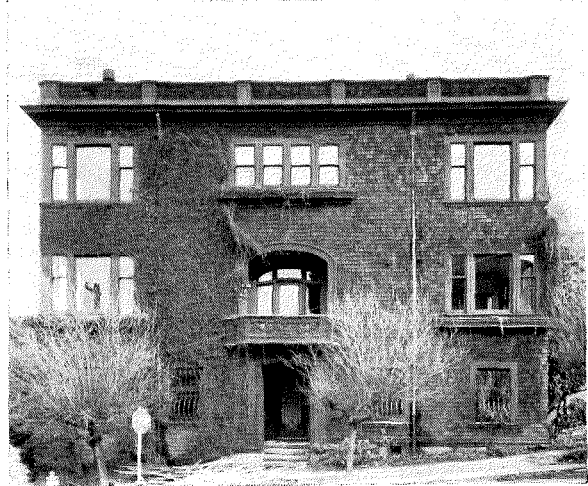
The owners had the courage to approve stripping the skeleton of virtually everything but floors, roof and central stairway and building a new house on the old framework. Broken down into major items (cost figures available are indicated p. 144) this seven-months undertaking consisted of:

► Measuring all rooms and drawing up complete floor plans to work from. (Old building plans were lost when the city's records were destroyed in 1906.)

Photos: Roger Sturtevant; Pirkle Jones

- ▶ Combining old ground floor storage rooms, installing a new floor slab and overhead door to create a two-car garage (\$2,500).
- ▶ Knocking out a large number of interior partitions on all floors, finishing new and old walls in plaster, painted birch or lacquered fir plywood.
- ▶ Incorporating 12 new steel beams and a handful of pipe columns to carry the existing structure over new open planning.
- ▶ Ripping old shingles and sheathing off the exterior, replacing them with 1" fir sheathing and vertical 1" x 6" stained redwood siding.
- ▶ Cutting out some of the old exterior wall studs, substituting heavier wood posts to carry larger plate glass window openings on all floors.
- ▶ Removing the old roof balustrade and cornice, framing out a new 6' overhang and fascia, regraveling existing roofing, reducing the height of protruding stacks and vents.
- ▶ Adding two balconies (\$2,750), outside stairs to the new garden and service entrance (\$875).
- ▶ Introducing new bathroom, kitchen and laundry equipment and plumbing lines (\$4,158), flashing, gutters and downspouts.
- ▶ Replacing all old flooring with 2" oak and fir planks, tile and linoleum (\$965); new stair treads and risers, cabinetwork, doors, window sash, sound insulation between bedrooms. The painting contract totaled \$3,470.
- ▶ Installing a new 150,000 Btu hot-air furnace in the garage and adding new ductwork to the old system (\$1,600). Rebuilding of old fireplaces \$2,650.

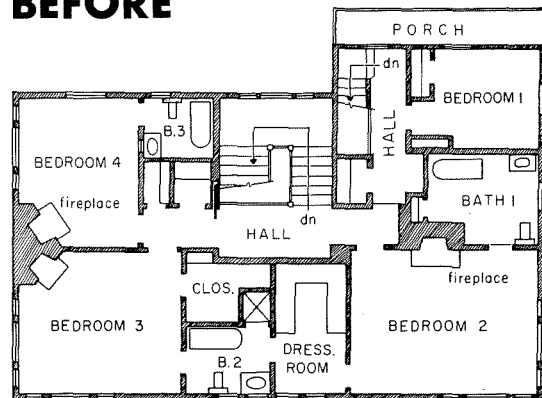
Pirkle Jones



THIRD FLOOR: A back bedroom became a new bath-dressing area off the master bedroom, with ample central and perimeter storage.

- ▶ The four bedrooms were rearranged to provide bigger windows, more closet space; a balcony was added for sun and garden view. (Note new steel beams above, indicated by dotted lines in plan.)
- ▶ Two baths and a large linen closet replaced single bath, small closet.

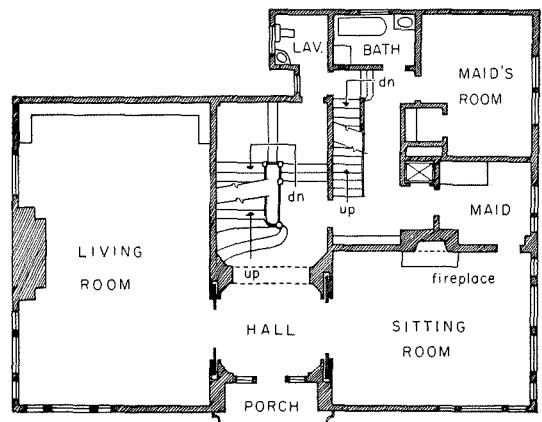
BEFORE



THIRD FLOOR

SECOND FLOOR: Dining and kitchen areas were moved from the ground floor and united with hall and living room. Result: easy circulation, more space and fenestration. A new dining porch leads out and down to garden. (Note steel beams that carry structure above.)

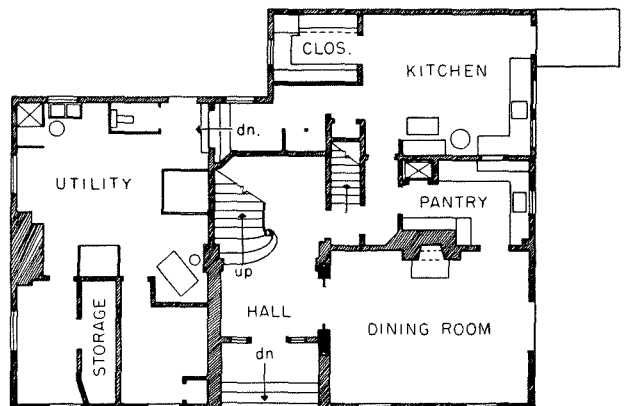
- ▶ Service stairs were removed to the outside and rear, providing private access away from the front of the house.
- ▶ For guests, a powder-room-coat-closet was added off the hall.



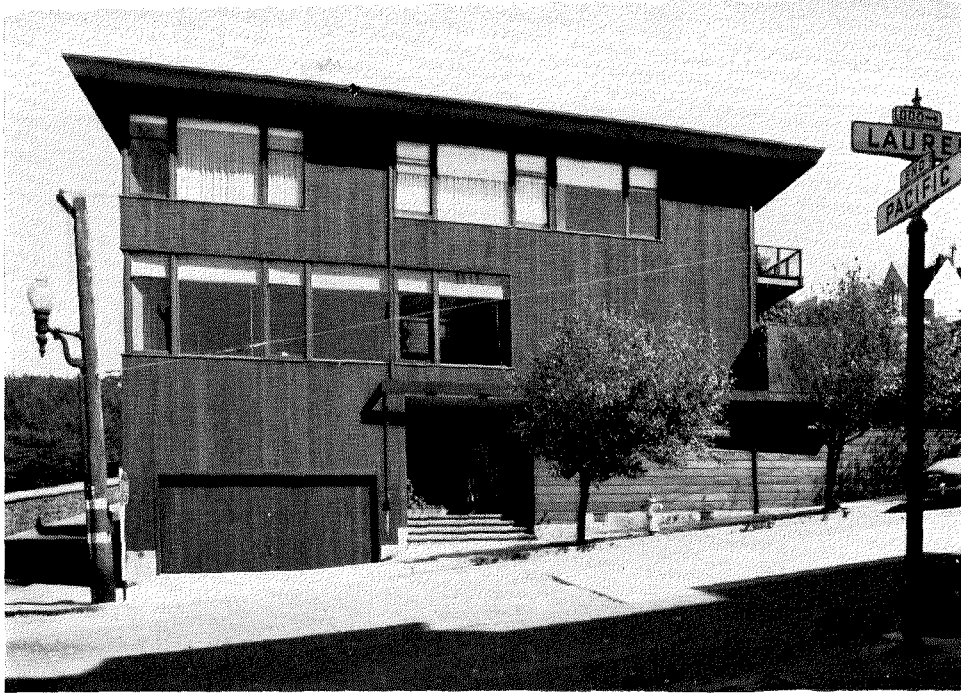
SECOND FLOOR

FIRST FLOOR: A two-car garage was made possible by combining several old storage rooms, installing an overhead door and moving tree, fireplug and stop sign to permit access.

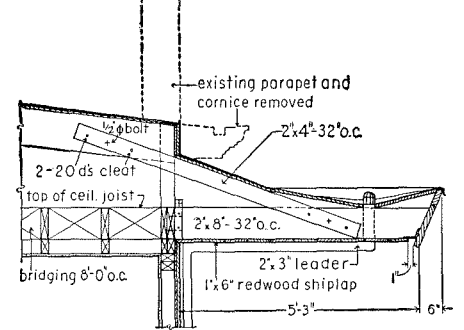
- ▶ A "garden room," replacing the old dining room, extends into the new front entrance hall on one side, the garden on the other.
- ▶ The two maids' rooms and bath were dropped down from the second floor to occupy the less central first floor rear.



FIRST FLOOR

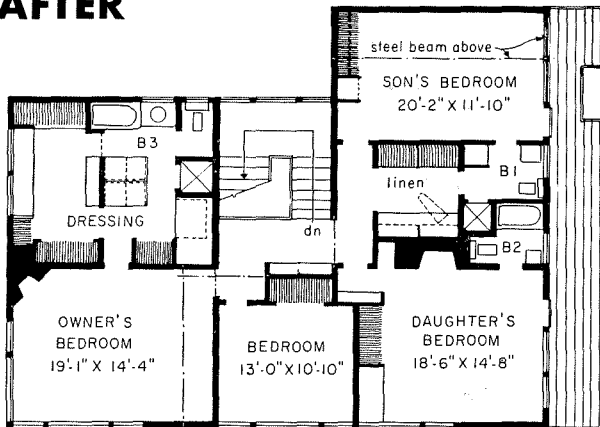


Photos: Roger Sturtevant

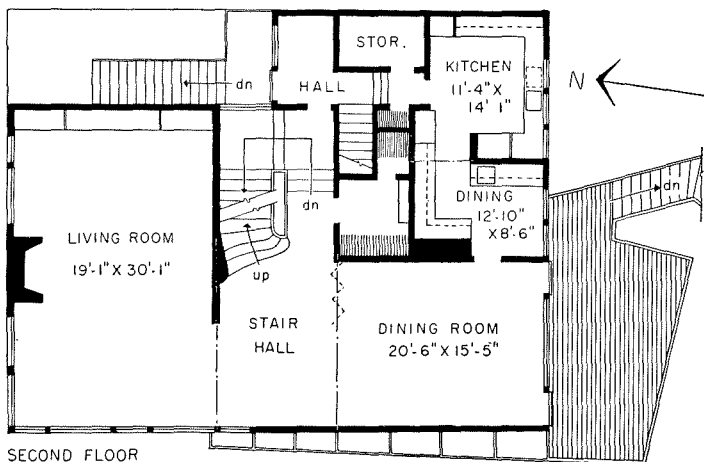


THE NEW FRONT (WEST) ELEVATION was cleaned up by removing roof balustrade, extending overhang, replacing main entrance and porch with wider, deep-set entry highlighted by glass and plant box. Horizontal lines of new continuous windows, garage door, trellis and siding help tie tall house to its site. Note new vertical redwood siding, bedroom, dining room balconies.

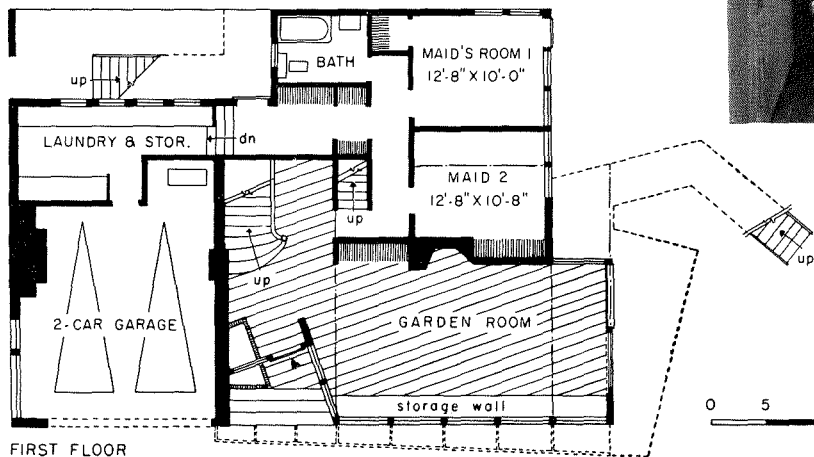
AFTER



THIRD FLOOR



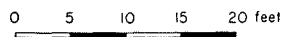
SECOND FLOOR

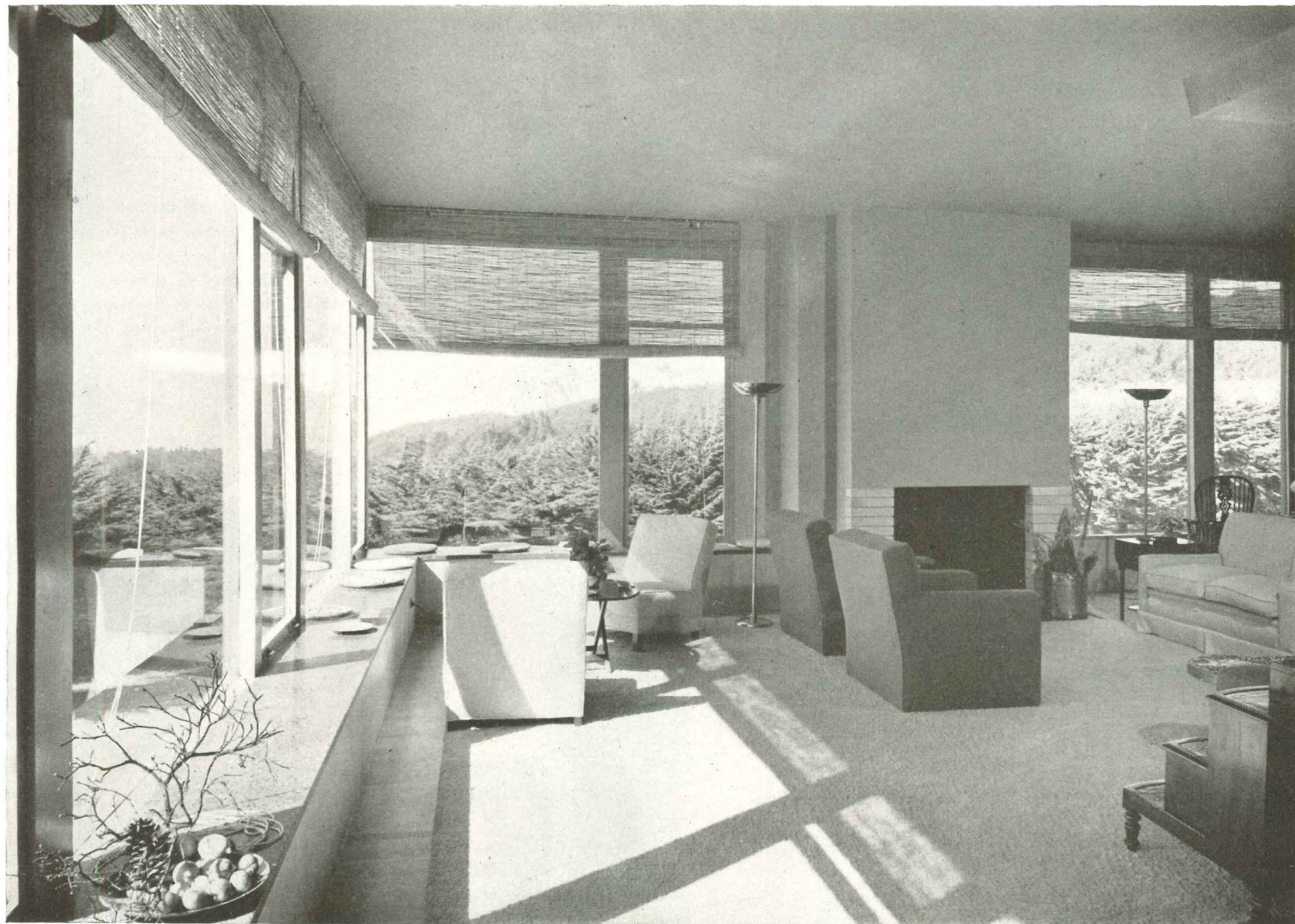


FIRST FLOOR



NEW "GARDEN ROOM," converted from former dining room, opens through sliding glass doors to garden beyond. High strip windows for street privacy may be seen above the long storage wall at right. This area serves as sitting, hobby and music room and a place for the owner's children to entertain their friends as they grow older.

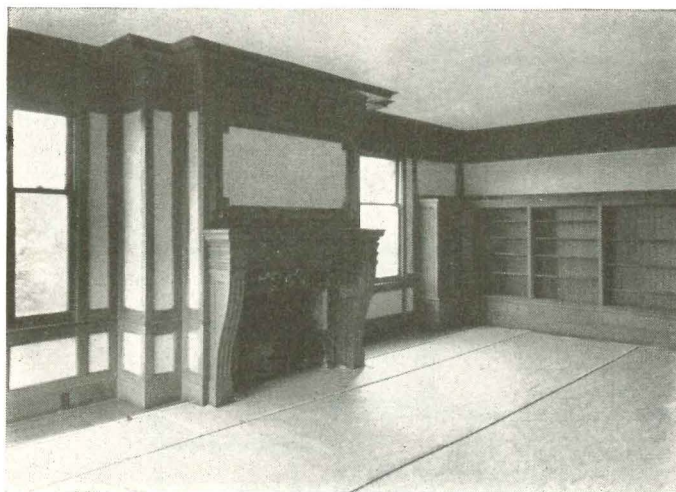




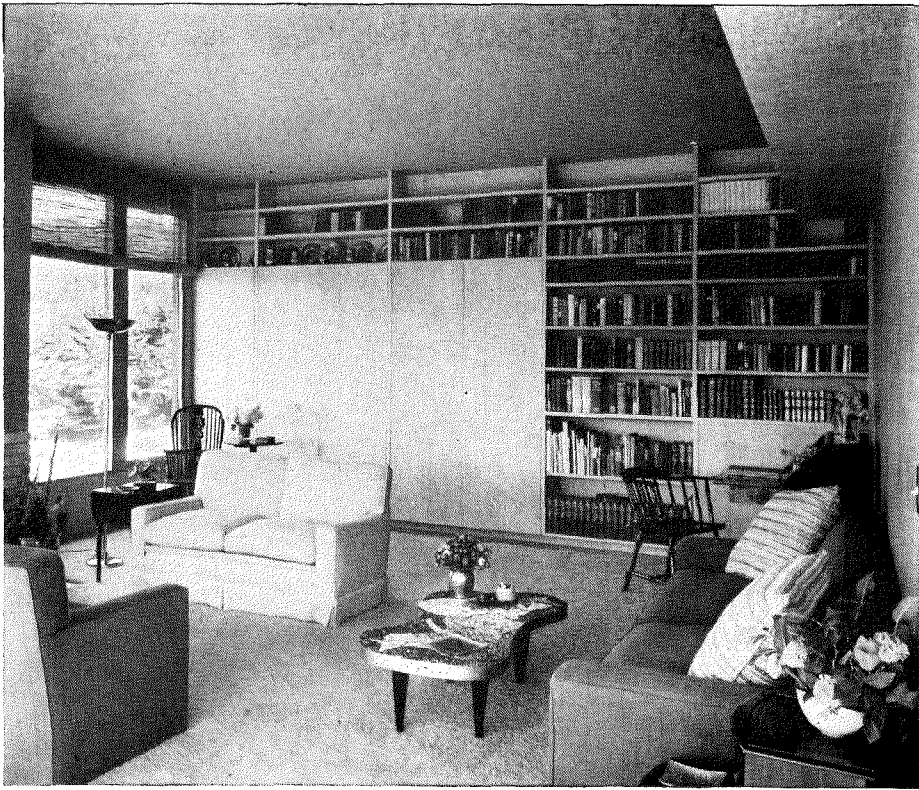
VIEW 1: North and west views from new living room

The second floor, shown on this and opposite pages, underwent a striking renovation. With the removal of the bottleneck central hall and its arches, doors and front balcony, the entire floor was thrown open from end to end. Living, dining and kitchen areas are now in a much more open and workable relationship to each other and to the new dining alcove and the dining deck overlooking the garden. In the refurbished living room (*above*) new exposed 4" x 4" posts permit wide fenestration towards park and bay; a low window bench and continuous carpeting extend through the hall area into the dining end, helping to integrate the whole floor visually. A new fireplace front was applied to the old chimney breast and flue; birch bookshelves, cabinets and bar were built in along one wall. The old dark stair hall is now lighted by full-width windows, and heavy, ornate stairs were replaced with simple oak treads, risers and banister. The dining end (lighted by a glass wall opening on its private deck and by indirect light coves) can be partially closed off by a folding partition of birch plywood sections piano-hinged together. Interior color scheme: gray-green, blue-green, light yellow.

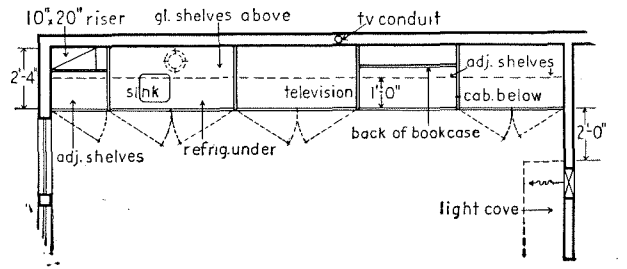
Photos: (*below*) Pirkle Jones; (*others*) Roger Sturtevant



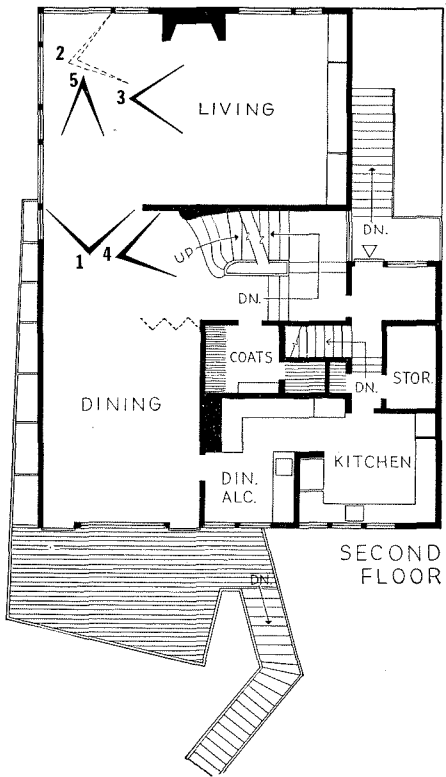
VIEW 2: Old living room had small windows, dark wood paneling, heavy molding and mantel, was separate from hall, kitchen and dining room.



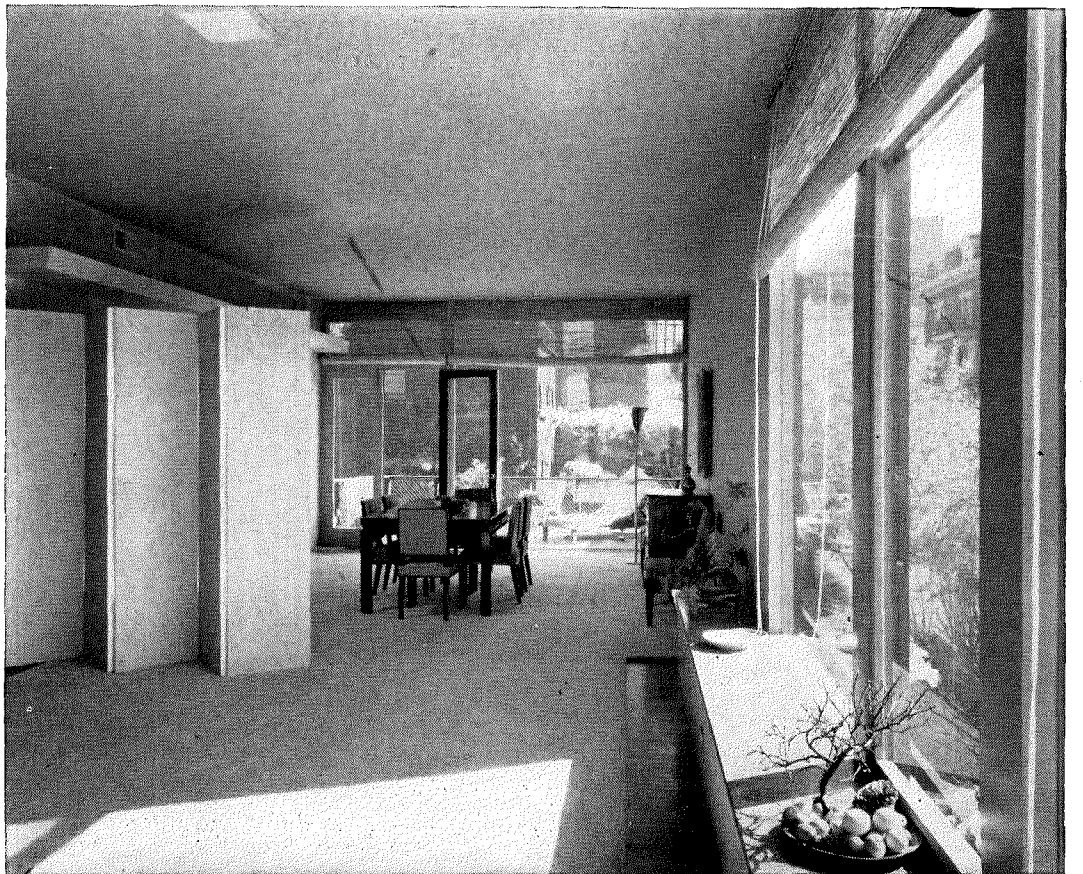
VIEW 3: Library end of main living room

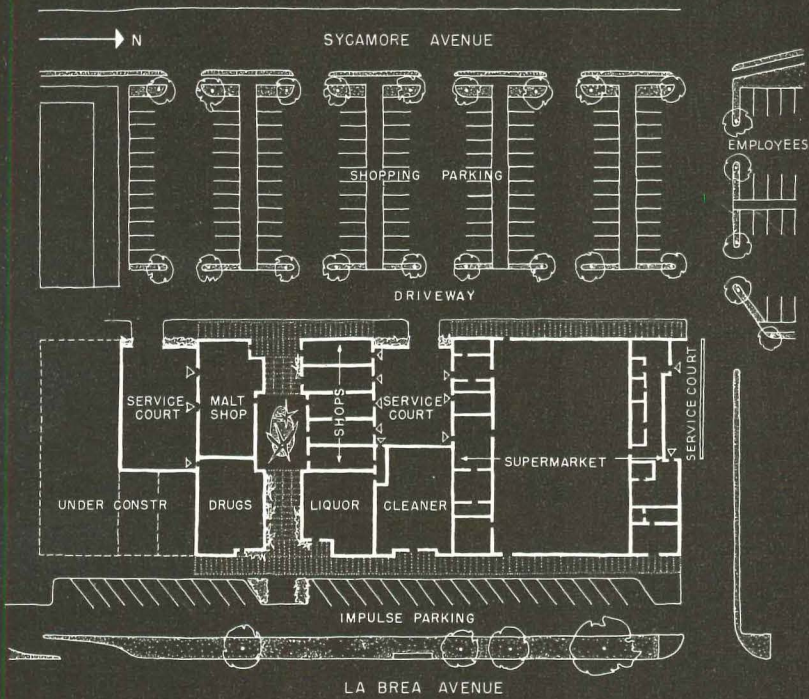
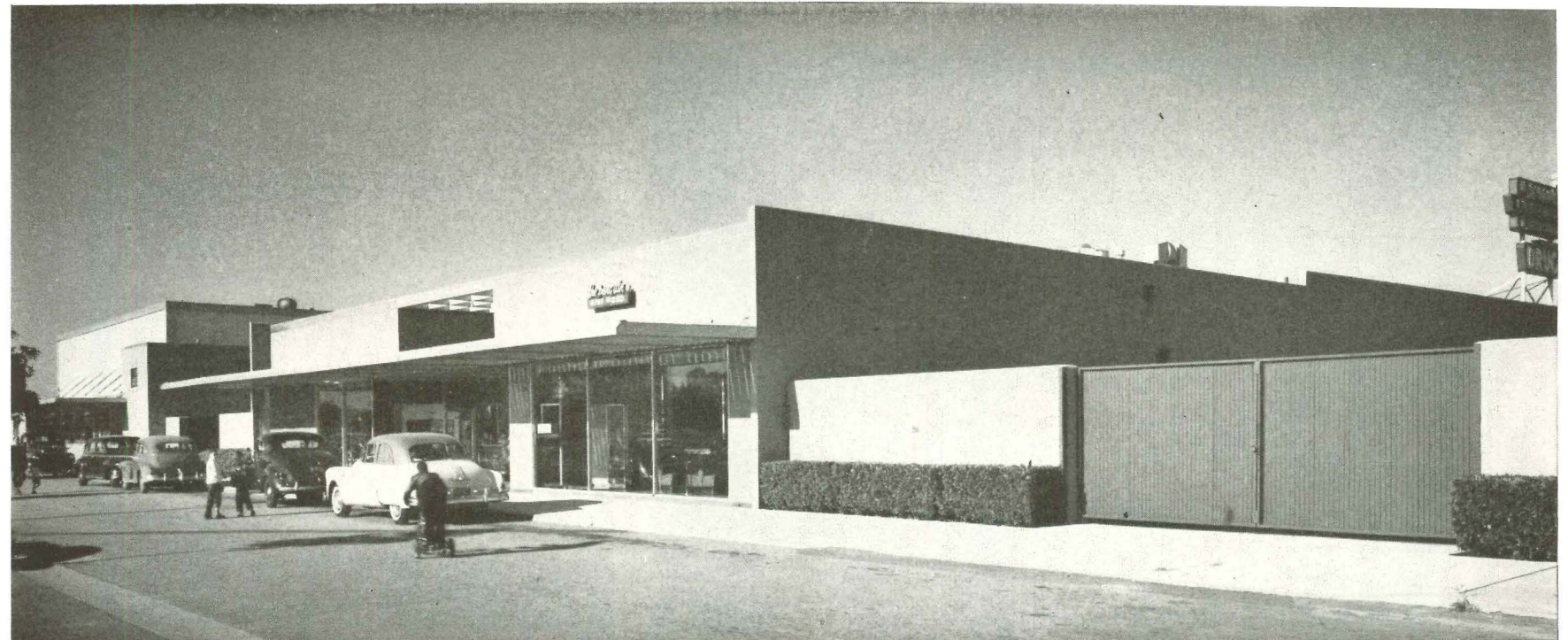


VIEW 4: New stair hall, below, has big windows on all three floors, greatly simplified wall, steps and banister treatment.



VIEW 5: From living room, space flows uninterrupted through hall and dining area.





SECONDARY FRONT, seen from the major parking area behind the stores, has inset service courts for removal of refuse and deliveries to stores grouped around them. This practical solution saves the expense of freight ramps or tunnels, keeps loading and unloading out of shoppers' way and vice versa. Courts are hidden from customers' view by high landscaped walls and gates. Supermarket, which requires most service area, was placed at end of layout where an additional service alley could be inset.

MAIN FRONT at night is a brightly lighted showcase that lures late shoppers. First units built, supermarket and restaurant, may be seen at right. In front of stores is a secondary street for traffic circulation and "impulse" parking, separated from main traffic artery by grass island strip at right. Floor area of completed stores (plan, left) totals 13,425 sq. ft.



BALDWIN HILLS BUILDS

A SHOPPING CENTER—a study for builder-developers

planning expandable neighborhood retail districts

LOCATION: Los Angeles

ROBERT E. ALEXANDER, AIA, Chief Architect

BALDWIN HILLS CO., Owners and Developers

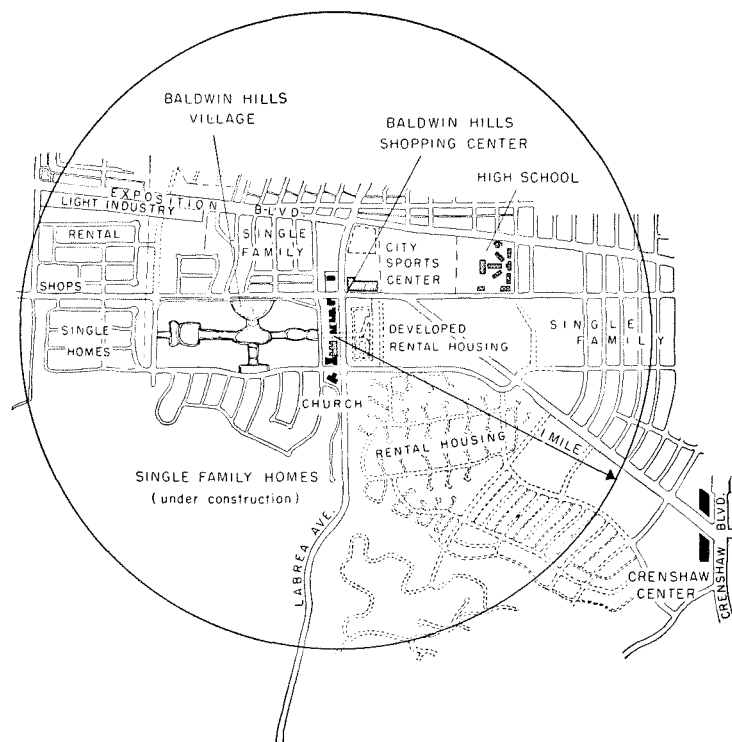
HERBERT BARUCH CO., Chief Contractors

MERRILL W. WINANS, Landscape Architect

Baldwin Hills Village, most talked about and most widely praised of prewar model communities, is now adding a shopping center which combines new and time-tested practices in a way that should interest both architects and developers. These include:

- ▶ A two-front plan—one front to attract passing motorists from the boulevard, one to serve Baldwin Hills and other nearby residents.
- ▶ A three-section parking system—one for passersby, one for local residents, one for employees.
- ▶ Interior courts to hide the service areas for each group of stores behind neat walls and gates (these courts are cheaper than ramps or tunnels).
- ▶ Anchor establishments at either end—a movie and a supermarket—to draw customers and keep them circulating past the smaller stores between.
- ▶ An ingenious new design for open, louvered marquees that lets in light but keeps out rain.

The shopping center on these pages is owned and operated by the Baldwin Hills Co., whose Baldwin Hills Village across the street to the west has been hailed as one of the most progressive planned communities in the country. (Controlling interest in the company is owned by the estate of Anita Baldwin, daughter of California's famed land tycoon and horse fancier "Lucky" Baldwin.) The village, conceived in 1938 and started in 1941, contains 672 rental units in two-story garden apartments oriented around patios and parking courts, with a long, landscaped mall extending down the middle of its 80-acre expanse. It was planned for middle income families and plenty of space (seven families per acre, with only 15% land coverage), has been praised as one of the most logical, attractive and livable rental community solutions since Sunnyside Gardens, Radburn and Greenbelt. Said Lewis Mumford: "A fundamental advance in planning and architecture. . . every aspect of its physical development has been thought through." It was sold in 1949, at a comfortable profit, to the New England Mutual Life Insurance Co. Two of its architects, Alexander and Wilson, have lived there themselves and are the chief creators of the later shopping center.



The center's retail trade area (above) includes an estimated 25,000 persons (with a high average annual income of \$6,000-\$7,000) living within a 1-mi. radius in several large 608 rental housing projects and single-family home developments. Present focus of regional shopping, and a large factor in considering Baldwin Hills's retail expansion, is the giant Crenshaw Center only 1¼ mi. to the southeast. Here the big May Co. and Broadway department stores handle most of the area's demand for heavy durable goods, and a large supermarket and other outlets satisfy the immediate vicinity's lighter merchandise needs. Other more limited competition: a small retail center 1½ mi. west of LaBrea Avenue, a combined drugstore-office building under construction diagonally across from the Baldwin Hills center. The area, however, has a relatively high population density and is still under development. In the sketch, Culver City, Santa Monica and the ocean are to the west, Los Angeles Civic Center 8 mi. (30 mins. by bus and trolley) northeast.

Photos: Julius Shulman

BALDWIN HILLS SHOPPING CENTER

The center is of the so-called "two-front" type: (1) a neon-decked glass showcase on the main artery to draw customers into its parallel private drive and off-street parking and (2) a less showy but more simply presentable front on the main parking area. (This is not "the rear," the architects hasten to add, but "the other front.") Unless they go through the back door of the supermarket, most shoppers pass through the central arcade from one front to the other and are thus exposed to the attractions in the smaller arcade shops.

The whole 1,800' block is broken by a central mall (not yet built) along the east-west axis, and a secondary arcade, to conform with local ordinances requiring fire-breaks. More important, these pass-throughs permit easy circulation from the major parking area to the front, and boost total store frontage with additional interior frontage

which can be leased to small, low-volume retail or service shops, such as beauty parlor, florist, gift shop.

In fact, however, the center's big failing to date is lack of this foot traffic through the present arcade, which makes life hard on the arcade shops, and on the center's owners, who lease on a percentage of each shop's gross income. Baldwin Hills Co. expects that further development along the lines of the master plan (*see next page*) will bring more trade to the smaller stores. Baldwin Hills Co. first secures a lease from the tenant, then builds and maintains his store space. It was necessary to plan the center in units, to be built one at a time in pace with the demand. (As Gross-Morton say, "Empty stores can murder you; it's better to have vacant land than vacant stores.") It seems to boil down to the developer's old chicken-and-egg headache: which comes first, more shoppers or more stores?



Arcade gives the center additional store fronts, serves as a link between the two parking areas and qualifies legally as a firebreak.



PARKING is a three-part system (facilities are provided for 650 cars, 300 of them directly in front of or behind the existing stores):

▶ A major parking area behind the stores for regular "heavy duty" shoppers buying groceries or making stops in several of the center's shops. Parking banks are 75' on centers, with 10' walks and planting strips in between. The area between the theater and existing stores is also asphalted to provide extra parking until such time as it is occupied by more shops.

▶ An "impulse" parking strip along the main artery of LaBrea Avenue, but separated from it by a landscaped "island." This strip was designed to accommodate in-and-out, one-purchase shoppers lured in by the center's signs, windows and the prospect of finding a convenient parking place.

▶ An employee parking lot behind the service station, to keep store workers from taking the choice parking locations directly behind the stores.

1. Drive-in restaurant, on a separate 1.8-acre site across Rodeo Road, is a highly popular eating place which draws much outside trade. Cost: \$260,000, plus a recent \$30,000 for 75 more seats in the dining room. Lease: 20 years. Architects: Lewis E. Wilson and Wayne McAllister.

2. Service station, in an excellent corner location, does a whopping big business, even for Los Angeles, pumping an average of 40,000 gals. per month.

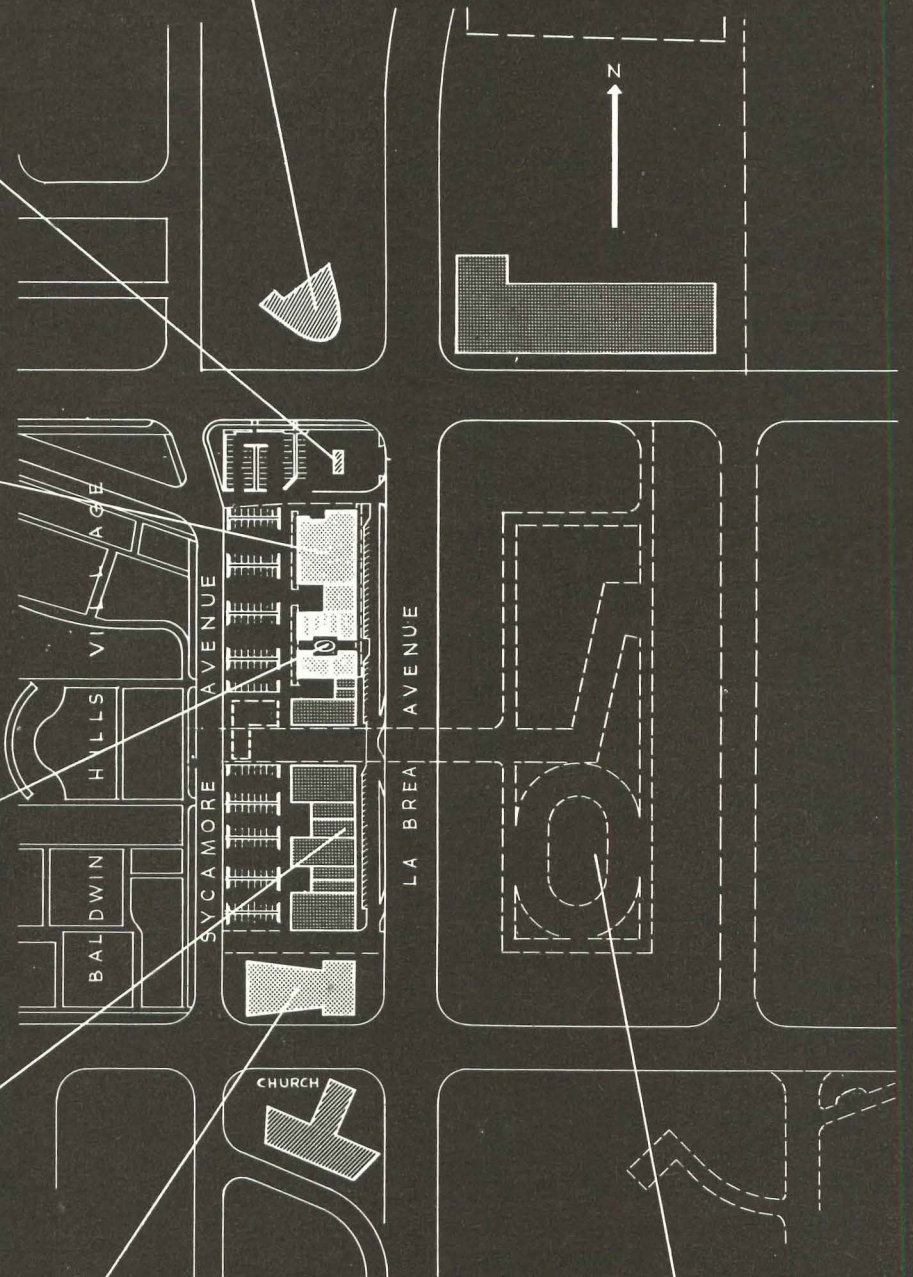
3. Supermarket, owned by the Fitzsimmons grocery chain, does more business in one month than the theater (below) does in one year. Together with the drive-in, it totals a gross volume in excess of \$2½ million yearly. The "key" high volume store, it was the first building completed (in 1948), at a cost of \$220,000. Lease: 20 years. Architect: Lewis E. Wilson.

4. Arcade and small shops include: flowers, gifts, shoe repair, barber, beauty salon, liquor and spice shop, dry cleaning and laundry, malted milk shop and drugstore. Cost, including landscaping: \$161,000. Leases: 5 to 10 years. Architect: Robert E. Alexander. Only the laundry and dry cleaning shop is reported doing an above-average business so far.

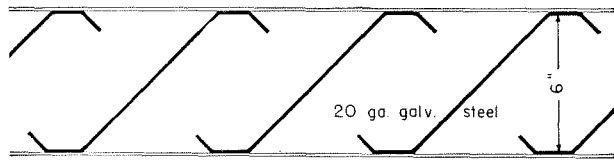
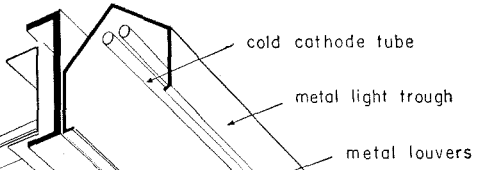
5. Proposed stores: a 5-&-10¢ store is contemplated, and negotiations are under way for a "junior" department store.

6. Theater: finished in the summer of 1949 as the southern "anchor," this big (1,725-seat) house is unable to get first run pictures right away, as originally intended, must wait until two weeks after release. And as in the case of other theaters, television has also been blamed for low attendance figures. Pining for lack of patronage, it reduced prices 18 months ago, is packed on week ends but still not making much more than a break-even figure. Cost: \$340,000 (excluding seats and furnishings). Lease: 20 years. Architect: Lewis E. Wilson. While market and restaurant together gross \$2½ million, the theater plus all other shops do some \$350,000 to \$400,000 annually.

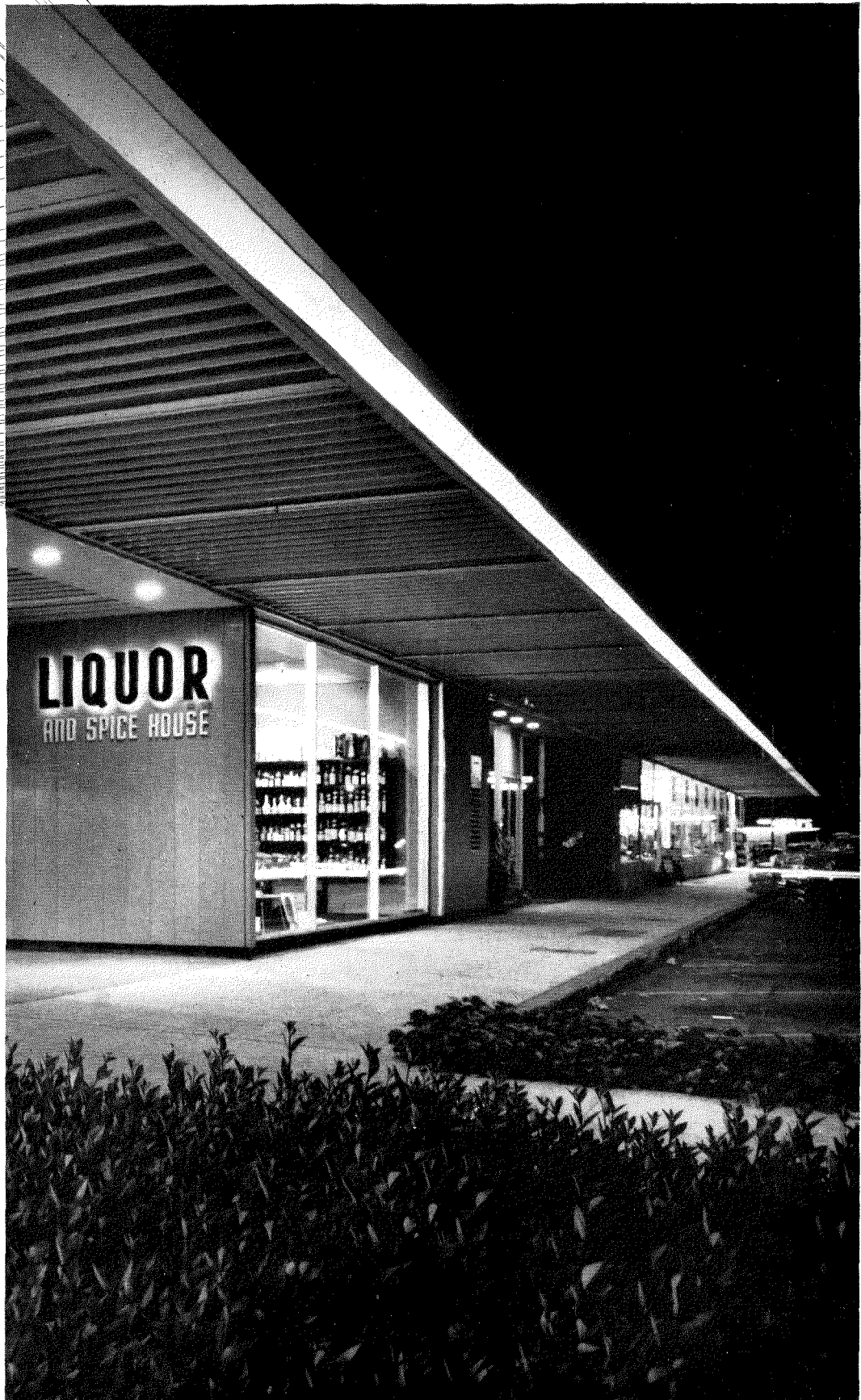
7. Proposed shopping center additions: across LaBrea Avenue from the present 8-acre site and linked to it by overhead foot bridges, the Baldwin Hills Co. contemplates developing an additional 15 acres into a spiral-type department store, outdoor restaurant, plant nursery, patio furniture store, natatorium. For shoppers' children, a "Toy Town" supervised by the department store will offer miniature carousels, Ferris wheels, toy trains and pony rides.



BALDWIN HILLS SHOPPING CENTER



SECTION A-A



One of the most novel and useful design details in the center is the long, 9'-wide lowered marquee on the stores' main front. To get away from the usual awnings or fixed opaque overhangs, the architects designed this marquee high enough above the sidewalk to keep it from obscuring view and light, yet low enough to eliminate reflected glare on the store windows. The aluminum louvers slope up toward the north, letting in north light but keeping hot south sun off shoppers and merchandise, especially the market's perishable fruit and vegetable displays. Along the outer edge of the marquee, fluorescent strip tubing lights the sidewalk and complements the center's dramatic over-all lighting as an added come-on to night shoppers. Each louver has its individual gutter, crimped into its lower edge, to carry rain water to the outer brim of the overhang.