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The Architectural FORUM is published monthly by TIME Inc., Time & Life Building, 9 Rockefeller Plaza, New York 20, N. Y. Address subscriptions to 540 North Michigan Avenue, Chicago 11, III. Address all editorial correspon-dence to Time & Life Building, 9 Rockefeller Plaza, New York 20, N. Y. Yearly subscription payable in advance. To individuals or forms (and their emilersa) encaged York 20, N. Y. Yearly subscription payable in advance. To individuals or firms (and their employes) engaged in Building-design, construction, finance, realty; ma-terial distribution, production or manufacture; government agencies and supervisory employes; commercial and in-dustrial organizations with a building program and their executives; teachers and students of Architecture and Engineering; professional clubs, societies and trade associations connected with the building industry; ad-vertisers and publishers: USA, Possessions and Canada, \$5.50; Pan American Union and the Philippines, \$9.00; elsewhere, \$12.00. To those not connected with the Build. \$5.30; Pan American Union and the Philippines, \$9.00; elsewhere, \$12.00. To those not connected with the Build-ing Industry; USA, Possessions and Canada, \$11.00; else-where, \$17.50. Single copies, if available, \$2. All copies mailed flat. Copyright under International Copyright Convention. All rights reserved under the Pan American Copyright Convention. Entered as Second Class Matter July 17, 1944 at the Post Office at New York, N. Y., under the act of March 3, 1879. Copyright 1950 by TIME Inc.

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VOLUME 93. NUMBER 1



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# BOOM ROLLS ON despite materials shortages and price hikes. It will probably carry through to year's end, but some worry that we are "borrowing from the future"

Dependent for its weed-like growth on the lavish fertilizer of easy money, 1950's bumper building crop may not be self-sustaining. But the month's developments indicated that it is not so inflated that it will go to seed under the first rough wind. Last month, despite the shortages of crucial materials and their resultant higher costs, the boom was still growing at its breath-taking rate. In May, while the building materials wholesale price index climbed 4 points to 198 (with lumber alone jumping 11 points to hit 311\*), construction kept right on making records. The dollar volume of total new construction put in place was \$1.9 billion-plus, a greater-than-seasonal increase of 14 per cent over April, and 23 per cent over May, 1949, bringing the first five months of 1950 to 21 per cent above the same period last year.

The big increase reflected advances in every category—led by private housebuilding, whose \$825 million for May jumped the five-month total to 51 per cent over last year's. (Some even thought the housebuilding market was good *because* of the rising spiral of costs. Said the U. S. Savings & Loan League: "The upward pressure on costs in recent months has probably stimulated the immediate desire for housing. Those who have been waiting for downward cost revisions are tending to enter the market rather than to postpone decisions. . . .")

**Commercial, industrial up.** But there were other increases, which, although not so dramatic, were in a way just as heartening. Commercial and industrial building, although still behind 1949's first-five-month totals (commercial 2 per cent less, industrial 10 per cent), had shared in the month's big jump—commercial with 22 per cent increase, industrial with 6 per cent. And American business, for the third time since January 1, revised upward its estimate of how much it would plunk down this year on new plants and equipment—\$17 billion, just 6 per cent under last year's outlay.

It was all part of the giddy level the business economy found itself in. Everything looked good. Unemployment was down. National income stayed high. Even the national deficit would not be as high as had been feared. Together, building and automobile manufacturing were supporting from one quarter to one third of the boom, and generating activity in just about every other section. Furniture maker Frank Seidman happily predicted the "second quarter of 1950 promises to be the best quarter the wood household furniture industry has ever enjoyed." Harvard Economist Malcolm P. McNair told happy retailers that department stores, which "bore the brunt" of last year's recession, would show no such declining profit this year.

No let-up. And nowhere did anyone see a let-up. Forecasters who had previously held their prediction of a continued high level to the foreseeable month or two now fell over themselves predicting that all of 1950 would be good.

### NEW MORTGAGE CLEARING HOUSE, organized by leading builders, will provide needed liquidity for the home loan market and may put FNMA in its place

While housing demand is nationwide, building money is concentrated in a few big cities—mostly in the northeast. As a result, mortgagees in the financial hinterlands run quickly out of money while the concentrated big institutional investors overflow with it. And homebuilding suffers accordingly.

Long plagued with this problem, the industry can now take real hope that a solution is in sight. This month will see the organization of a new kind of company, which will act as a national broker or clearing house for the sellers and buyers of mortgages and thus add liquidity to the home mortgage market. It will be called Housing Securities, Inc., have its office in New York City and be headed by Thomas P. Coogan of Miami, President of the National Association of Home Builders. But Coogan is only one of 100 homebuilders who have subscribed to the company's \$300,000 of non-negotiable paid-in capital stock (limited to not more than 50 shares each. And he is only one of 12 house builders in all parts of the country who will overwatch the company's business as its officers.\*

About the only ones who were worried were those who feared we might be shooting the works now and have nothing left to shoot with when the boom is over. One of these, Joseph Stagg Lawrence, vice president of the Empire Trust Co. in New York, gloomily scanned the frenzied activity of building and automobiles and decided they were both "borrowing from the future." Another, ex-chairman of the Council of Economic Advisers Edwin G. Nourse, had been afraid of just that for some time. Asked he again last month: "By cashing in past savings and drawing on future income through extreme credit extension rather than finding a true market balance between full-volume production and current consumer income, have we not failed to save our market-supporting ammunition?"

Serving as a stock exchange for the mortgage business, Housing Securities, Inc., will obtain orders from institutional investors to buy large quantities of mortgages in diversified areas and, against these orders, will then issue firm commitments to mortgagees for the purchase of FHA and VA mortgages. For this service the seller will pay one-half a point. The new company will originate no loans and handle no servicing, will thus compete with no established organizations in the home finance field. It will not even compete with the Federal National Mortgage Association which, unlike Housing Securities, Inc., buys mortgages for its own account. As a matter of fact, the new company, when it gets going, should reduce FNMA to the stopgap buyer it was originally intended to be.

Housing Securities, Inc., is a completely private venture with no Government strings attached. As such, it hopes to prove that there is no need for Government-chartered mortgage associations such as authorized in recent RFC legislation (see p. 14). It also hopes to educate commercial banks on the advantages of taking part in the housing program, particularly with reference to construction loans, and to entice the monies of other banks, trust companies, investing institutions, private funds and individuals into the mortgage field.

<sup>\*</sup> There were heartening signs, however, that lumber's shortage was waning. At the end of May, according to the National Lumber Manufacturers Association, more lumber was being produced than ordered.

<sup>\*</sup> First Vice President Nathan Manilow, Chicago, 2nd Vice President George Goodyear, Charlotte, N. C.; Treasurer R. G. Hughes, Pampa, Tex.; Secretary Joseph Meyerhoff, Baltimore, Md. Directors: David Bohannon, San Mateo, Calif.; Alan Brockbank, Salt Lake City; Frank Burns, Denver; W. W. Caruth, Dallas; Henry Fett, Detroit; F N. Spiegel, New York City; O. C. Stringfellow, Seattle.

## WASHINGTON

### RENT CONTROLS will stand for another six months

Within a safe margin of the June 30 expiration date for federal rent control, Congress passed a bobtailed version of an extension bill. It keeps the lid on for six more months, leaves it up to localities to decide whether they want the federal program to continue in their baliwicks for another six months. The House had written in an amendment making the initial extension cover a seven month period but the extra month was knocked out in the conference committee powwow. The Senate stood firm for an automatic shut-off on December 31, subject to the local option provision as to whether controls would stay on through June 1951.

Alibis offered. Suffering a worse trouncing than in any battle they have waged against rent control extension in recent years, opposition forces had two alibis:

1) The new bill was so watered down that it did not seem much of a menace to most on-the-fence Congressmen. Actually it promised to be the ideal solution to the problem which Congress has been seeking for some time; a self-extinguishing kind of extension program. Even though Federal Rent Director Tighe Woods predicted that the overwhelming majority of big cities would vote for the last ounce of extension under the local option clause, it was apparent that federal control would apply to such a small portion of the country when the new bill runs out that further extension would just look silly. Through decontrol actions more than half of the states have now been removed under the federal program. By next June what is left will be slim pickings indeed.

2) Administration leaders were able to keep many wavering southern Democrats in line by warning them that if rent control went by the boards, their party might lose its grip on Congress. The argument went like this: In some of the key election contests in large industrial states, the Democratic incumbents need to have rent control renewed if they are to win. This is especially true in the case of Senatorial elections in Illinois and Pennsylvania. The Democrats cannot afford to lose much ground if they are to retain control of the Senate. Obviously if they become the minority party again, the southern group would lose quite a few important committee chairmanships and other emoluments

which belong to the party in control. It was sordid politics but it worked.

### LUSTRON MIXUP prompts another investigation

Long a champion headline getter, the Lustron controversy was front page news again last month—just when the RFC felt that it had everything under control. The foreclosure suit, which the RFC decided months ago was the only way to recoup even a small part of its \$37 million loan, had virtually been completed. RFC itself was the only bidder; it bought the facilities back for \$6 million. Actually it did not have to put up any cash. It was permitted to bid any amount up to the total of its loan as a kind of bookkeeping proposition.

But then the proceedings went haywire. A Chicago federal district court, at the request of a few minority Lustron creditors, joined the fray and took issue with the Columbus, Ohio, federal court that was on the verge of confirming the sale to RFC. Caught between two courts in this manner, RFC was completely at sea as to where it stood. And so was everybody else. The Chicago court issued an injunction against RFC acquisition after the U. S. Marshal in charge of the plant had turned it over to the agency at the nod of the Columbus court.

To complicate things still further, the Columbus judge came to the conclusion that the whole Lustron deal should be investigated; he declared that he would impanel a federal grand jury to do the job if the Department of Justice did not follow his suggestion and do it. Having been the target of a countless number of Congressional and departmental investigations, former Lustron officials were inclined to welcome a final probe. Said ousted president Carl G. Strandlund: "I welcome any investigation which will permit us to present the real facts. . . . Lustron has been smeared and slandered." (Even minor developments helped complicate the picture. Item: Sen. Joseph McCarthy (R. Wis.), it was disclosed in a receiver's report, collected \$10,000 from Lustron for a promotion article written in 1948.)

The outcome looked more cloudy than ever. RFC had made it clear that the Lustron business would be resold as soon as it could turn over clear title to the right kind of bidder, but with things in their present mess nobody knew how long it would take the lawyers to figure out who actually owns the facilities. The only thing the RFC seemed sure about was that it would probably favor a resale deal that kept the plant in the steel house business.

### PUBLIC HOUSING, starting tardily, raises conflicts with FHA on room sizes

While the public housing program got off to a slow start (see below), its pace has not been quite as pokey as it seems. Actually, it was not possible to start operations until November of last year because appropriations did not become available until then. The authorizing legislation went on the books in August. Early last month PHA announced that the first contract had been let under the new program. It involved a 540 unit project in Bridgeport, Conn. In addition, ten "deferred" or "re-activated" projects were either under way or completed by the end of May. These were projects under the old program that were held up by the war and could not be started again because the previous cost limitation of \$1,250 per room was too low for the postwar period. The new program permitted them to qualify under its higher limit of \$1,750 per room and thus to be reactivated. There was enough financing authority left over from the former act to take care of them.

Still PHA was nowhere near in sight of the goal of 50,000 units that it had set for the first year of its program. However, the situation was not as comforting to private builders as might appear on the surface. PHA had fallen down in its predic-

BOX SCORE of the Public Housing Program, under the 1949 statute, as of June 1: Units

427,614
298,200
266,155
174,969
60,627
6,498
4,502
540

In addition, 2,831 units have been started in "reactivated" projects, approved under the old law but deferred by the stringent cost requirements of that law. Thus the federal public housing program for the year has made a contribution of only 3,371 units to the 537,600 total of public and private units started through May. Outside of the federal sphere, public housing units started this year under state and local programs, without federal aid, probably amount to another 5,000 to 6,000 units through May.

NEWS

tion; but this merely meant that the accumulation of projects for subsequent years would be greater. While the act confines the public housing program to 135,000 units a year for six years. The rate can be stepped up to 200,000 when and if the President and his Economic Council proclaim that the general business level is low enough to justify an acceleration. Obviously, if PHA has an accumulation of projects on hand it will be easier to shift into a higher speed when it gets the signal.

Room-size conflicts. Among the many bones of contention between the public and private housing crowds the one that even impartial observers have a hard time understanding concerns the conflict over standards. Room-size requirements for public housing are invariably higher. Thus for a two-bedroom unit, PHA stipulates that the square footage for the living room must be at least 160; for the kitchen-dining space, 105; for the first bedroom 125; and for the second bedroom, 110. On the other hand, FHA minimum requirements for a two bedroom rental unit are 150 square feet for the living room; 90 for the kitchen-dining space; 100 for the first bedroom; and 70 for the second bedroom.

Even though it appears that the fellow who pays his own freight is being treated more shabbily than the one who doesn't, PHA has an explanation to offer. It contends that public housing families are almost always larger than those seeking space in private housing—hence need more space. Also it argues that its projects have to stretch over a longer use period than FHA's. Not too happy over the situation either, FHA spokesmen make the point that builders are usually required to do more than just meet the minimum standards.

Grassroots fight. Meanwhile, the battle over public housing is being fought out at the grassroots. So far seven cities have voted to turn down proposals for participation in the program; through the action of their city councils, another 22 have decided at least tentatively not to go along. Public housers believe that there is still hope for repentance in some of these latter cases since in many of them rejection has been by the close squeak of one vote in the council. A little more pressure might cause a flipflop-something that both sides realize and are seeking to prevent or promote. The number of cities that have decided either with or without opposition to join the program totals 236. Preliminary loan authorizations cover a total of 266,155 dwelling units.

# LOW COST HOUSING to be promoted through FHA's revamped Title I section

After having turned up its nose for years at families destined to live on the wrong side of the tracks, FHA late last month was prepared to make handsome if somewhat tardy amends. It was rolling up its sleeves for a major drive to bring home ownership within the reach of lean-budget families-those with annual incomes around \$2,500. The mechanism to be used for the purpose is the new Title I program authorizing it to insure 95 per cent 30 year loans on a bargain basement type house. The cost is held down to the \$5,000 level for most places. An increase up to \$5,900 is permitted in high cost areas but FHA is not ready to take advantage of this escalator clause yet. If things go well, it expects to hit an appreciable volume of activity under the program by early fall, hopes eventually to reach a 200,000 unit a year clip. This would be close to half its present individual house volume.

If FHA achieves anything near the goal it has mapped out for itself under Title I, it will be headed for a collision with its sister agency in charge of public housing—the PHA. The government through PHA would be telling low income families that they should have nothing but the best in the way of housing—even though this meant large subsidies with only relative few benefitting. At the same time it would be saying out of the FHA side of its mouth that they should not expect more than they could pay for in satisfying their housing needs; would then offer to help them bridge the gap by trimming things down to a kind of austerity product. For HHFAdministrator Raymond Foley who has charge of both programs it looked like a tough job of riding two horses going in opposite directions.

Neighborhood standards compromise. The trick to the new Title I approach lies not so much in reducing minimum construction requirements still further as in taking a more realistic view at neighborhood standards. Government technicians are now of the opinion that they have gone about as far as they can go with their housing striptease. They do not see how they can skimp much more on the structure itself, although they are willing to go along with some additional compromising in respect to finishing operations and equipment. For example, such items as insulation and the skirting around foundation posts may be eliminated. Also builders will be permitted to cut down on kitchen equipment and in some cases to leave out water heaters



TWO HOUSES WHICH COULD QUALIFY for Title I financing are shown above. Luther J. Boggs' "basic house" in Atlanta, although financed under Title II, has a low enough selling price (\$4,500) to permit building it under Title I. The two-bedroom house on the right, built by Gaines Homes in Miami sells for \$5,725.

and furnaces. Even an improved type of backyard privy will be tolerated in outlying areas where it does not run counter to local sanitation laws.

But by far the biggest factor in getting costs down will be the less snooty policy toward neighborhoods. There will be none of the fuss and bother over applying arbitrary rating requirements to a community as there is under the regular Title II program. In fact it is largely because of the uncompromising attitude pursued in this process that the mortgage insurance program has been slanted almost entirely toward the plusher suburbs. Under Title I, all that will be insisted upon is that the land be "buildable"-must not be swampy or have too steep a grade. Obviously this will open up fringe areas around the larger cities to this new type of economy housing. It will also bring in many small towns and remote suburbs that FHA is now inclined to by-pass or approach with a bag full of reservations.

Not for slum areas. Scattered lots in downat-the-heel sections may be good bets in some cases. But FHA does not look for any widespread use of the Title I approach in slum areas. The reason: slum land usually costs too much. It would be hard for a builder to put up an acceptable \$5,000 house if he had to pay much more than \$500 for his lot. In fact the lot cost ratio should be a good deal less.

Desultory attempts have been made in the past to produce economy type housing under Title I but beyond a few outstanding exceptions, they never got very far. One reason was that the insurance plan under Title I, which was set up primarily for financing unsecured repair and improvement loans, proved unsatisfactory as far as mortgages were concerned. The lender was only insured up to the point that his total losses did not exceed 10 per cent of his volume of loans under the program. This meant that unless he did a land office business-possible only in the case of the very biggest institutions-he received less protection than he thought he ought to have. Another reason was that old guard elements in the FHA have never approved of this plan for deviating from the tried and trusted Title II approach. They did their best to discourage venturesome builders by throwing every regulation in the book at them.

Entire portfolio insurance. This time things will be different. The entire mortgage portfolio of a lender will be insured. Moreover, the mortgages will be eligible for the



SOUTHWEST SKYSCRAPER: Dalla's new 36story Republic Bank Building will set a new southwest altitude record (600 ft. including the spire). And, it will go four stories underground to accommodate parking and motor banking facilities. UN-like in appearance, the \$15 million project was designed by UN Architects Harrison & Abromowitz in association with Grayson Gill and George F. Harrell of Dallas.

secondary market privileges offered by Fanny May. And since the FHA high command has given every indication that it is solidly behind the program, down the line sabotaging efforts appear less likely.

According to FHA calculations, a family should be able to swing a \$5,000 house with a \$4,750 mortgage with monthly payments of from \$30 to \$35. This would include taxes and insurance. Interest and principal payments alone would amount to slightly less than \$25 a month. In contrast, the average monthly payment necessary under the public housing program to make a family unit stand on its own feet is \$59.49 a month. However, federal subsidies absorb enough of this economic rent to bring the actual amount paid by tenants down to an average of \$30 a month including utilities.

Help for Negroes. While the Title I minimum house program was not thought up as something especially designed for Negroes, it is expected to be of great help in meeting the needs of underprivileged groups such as the colored families of the south. Southern builders have already shown a desire to trim costs and profits to take care of some of these families. In Atlanta, for instance, much housing has been built for Negroes at a cost of \$4,500. The point the FHA keeps insisting upon is that even though Title I housing has to get down to little more than fundamentals, it is still incomparably better than most facilities available to lower income families at anything approaching the same cost. Moreover, most of the existing accommodations

in this range consist of rental housing. Under Title I the family has a chance to build up some equity in its housing.

One possible cloud on the horizon concerns the attitude of the lenders. There is some apprehension that participation may be confined to the larger lending institutions because of the low interest rate. It is true that the Title I rate of 41/4 per cent is the same as Title II's. But some observers feel that because of the smaller mortgages involved in Title I and the fact that the program is new and untried, many lenders will be inclined to hold back. If this proves to be the case, a drive can be expected to sweeten the kitty by allowing the financing institution to charge a small monthly service fee—say 1/4 of 1 per cent.

### **GOVERNMENT RESEARCH** starts with study of materials distribution

Unlimbering its vast economic research powers, HHFA has started scanning the building front for the most likely spots to blast out a fresh crop of facts to help measure the housing problem.

First on the list is a sample study of how building products are distributed. While HHFA will foot the bill, it has assigned the job to the Wharton School of Finance at the University of Pennsylvania. The study will trace the flow of materials and equipment from the producers to the building site and attempt to bring the distribution pattern into sharper focus.

Other projects given top billing:

A pilot study of the housing market in a middle-sized industrial city will be conducted by the University of Miami Florida dealing with the picture in Jacksonville purpose is to help builders develop new short-term forecasting methods to guide their production.

▶ While Miami is studying the problem of how many houses to build, Carnegie Tech in Atlanta will try to develop methods by which builders may judge where (in what part of town) they should be built to meet the market.

The University of Denver has been assigned the development of a foolproof vacancy survey and a method of correlating vacancy and other market data.

• Columbia will analyze the validity of past market research methods and make recommendations for better methods.

> The University of Michigan will come up with some enlightening information when it asks 1,000 recent home buyers how they selected their houses and, six months later, asks them in what ways they are satisfied and dissatisfied with their purchases. Michigan will also tackle the problem of cost accounting for builders.

A breakdown of the 1949 house building volume will throw more light on the relative importance of builders in various categories of size. Thus this job, which has been delegated to the Bureau of Labor Statistics, will reveal the roles played by the one-house-a-year builder, those building up to 25, and the big time fellows putting up 100 or more.

A detailed study of the growth patterns of metropolitan areas will investigate the relationship between such factors as employment centers, lines of transportation, and commercial and recreational facilities. The torch in this case is being handed to the Scripps Foundation, Miami University, Oxford, Ohio.

As far as the studies themselves are concerned, building spokesmen as a general rule think it may be all to the good to establish a few basic facts. Some don't want the government nosing around in their fields at all, however, and most are a bit leery over the guinea pig type of study. They fear that the facts and statistics compiled may be used by government to help further its public housing efforts and otherwise crack down on private enterprise.

For their part, the government men see no cause for uneasiness. Director Richard Ratcliff of HHFA's Central Research Division has not operated in the dark but has discussed his plans fully with an industry advisory group. Moreover the policy he is following of shopping out most of the projects keeps HHFA from being a direct participant.

# **PUBLIC HOUSING**

### CLOSED SHOP in the building trades: has it NLRB's tacit approval?

Because of the intermittent and transitory character of the employment involved, it has been virtually impossible to apply the union-shop provisions of the Taft-Hartley Act to the building industry. It is an entirely different proposition from holding a collective bargaining election among the employees of a plant or other large business establishment. After several unsuccessful attempts had been made to stage representation elections among building workers on an area basis, General Counsel Robert N. Denham of the National Labor Relations Board decided that it was time to face facts. He recommended that the Board merely take such elections for granted-assume that they had been held and won. Last month the Board threw cold water on this proposal.

In a policy statement it readily admitted the difficulty of enforcing the certification section of the act in the building field. But it also took the lofty position that an administrative agency could not refuse to carry out the law-that the only remedy lay in Congressional action. Since Congress has been reluctant to tamper with the T-H Act through fear that Administration forces might scuttle the law once it was thrown open to amendments, it looked like a complete impasse. Even though it does not want to renounce jurisdiction in certification squabbles involving building workers, the Board has its hands tied as long as the General Counsel refuses to go along. Under the law, the General Counsel must bring a complaint to the Board before it can swing into action. Moreover, the General Counsel is made a power in his own right. The Board cannot control his actions or fire him.

Superficially it might appear that the building industry's status under the act had not been substantially altered. But building men who know their way around NLRB were not so sure. They strongly suspected that the General Counsel was doing more than just turning his back on the certification procedure, that he would also refuse to handle complaints where a worker had been fired for non-membership in a union. The end result, they believed, would be tacit approval of the closed shop in the industry.

Of course if pressure to have a nonunion worker fired were brought in such a way as to constitute an unfair labor practice, that would be something else again. The General Counsel has hung up a record for strict enforcement wherever he could come to grips with a case. Few believe that he would overlook a clear-cut violation on a building job covered by the law. It is a well known fact in the industry, however, that unions have ways of putting on a squeeze without commiting an overt act. Thus contractors who refuse to play ball in respect to closed shop demands are likely to find themselves confronted with a slowdown.

When it comes to building's two most chronic ills-secondary boycotts and juris-

MAMMOTH SHOPPING CENTER, covering 25 blocks in suburban Detroit,

will include J. L. Hudson's first branch store

Once upon a time Oscar Webber, president of the J. L. Hudson Co., second largest retailers in the U. S., was well satisfied with Hudson's downtown Detroit location, and dead set against shopping centers. But, watching the "amazing" growth of outlying Detroit and the corresponding growth of Hudson's competition in those areas, he decided "we should get our portion of that business." The result, announced last month: a mammouth, \$15 million, shopping center on Detroit's east side. Covering 25 city blocks, it will contain more than 100 stores, which will be arranged in ring-like fashion surrounding a plaza. Dominant store (roundshaped) will be Hudson's branch store, which, Webber now believes, won't detract at all from downtown Hudson's sales. Construction will start next year. Architects: Gruen & Krummeck.



# NEWS

dictional disputes-there is nothing in the current flare-up over the union-shop procedure that will throw the act out of focus. Secondary boycotts can and have been dealt with whenever a proper showing of interstate commerce can be made. However, the Board has tended to ignore the average run of building work where it is difficult to make such a showing. Jurisdictional disputes have seldom reached the harassing stage thanks to the effective work of a contractor-labor arbitration board set up under the act. While arbitration committees of the purely advisory type have never accomplished very much, this one is different. It is assured of NLRB backstopping whenever necessary.

One building case that had been a natural for NLRB concerned a union rumpus over construction work at the Hanford, Wash. Atomic Energy Works. A machinist had been discharged under a closed-shop agreement with the International Union of Operating Engineers, during the early stages of a construction job. By mid-month, the Board was ready with its long awaited decision. It held that the Operating Engineers could not claim exclusive jurisdiction because the job was of such a nature that it subsequently involved many other types of workers. It ordered the contractor to reimburse the discharged machinist for any loss of wages he suffered. General view was that this case does not constitute any special precedent except perhaps for other federal construction.

## MONEY

### FANNY MAY gets \$250 million more; private agency looks doubtful

When it was finally dumped into the legislative hopper last month, the long-awaited bill giving Fanny May additional funds for purchasing mortgages and authorizing federal charters for privately formed mortgage associations proved something of a dud. At least mortgage men were disappointed that the increased amount for backstopping the secondary market was only half (\$250 million) what they had been promised. Added to the funds it already had on hand, this gave Fanny May about \$750 million for its mortgage purchasing activities.

But a few surprise provisions were tacked on to the measure. One of them gave a \$50 million increase to RFC's section 102, which authorizes loans to prefabricators. Another gave VA the right to nominate a member for Fanny May's Board. This was believed to be a sop to VA to make it feel better about having Fanny May shifted over to HHFAdministrator Raymond Foley's super housing agency—a transfer now in the works under the President's reorganization powers. Also involved in the regrouping plan is the RFC program for aiding prefabricators. Thus if Congress goes along as it is expected to, Foley will soon be running this show along with all his other activities.

Another provision permits lenders to sell 35 per cent of their eligible FHA mortgages and 75 per cent of their VA mortgages to Fanny May. However, although the language of the bill hasn't entirely jelled yet, Banking Committee members favor a provision requiring lenders to hold their mortgages for a certain period—probably six months — before selling them to the government-backed secondary market. Fanny May has some new restrictions imposed on it too—it can use only one-third of its funds in buying FHA loans. This means the two-thirds of the kitty will be reserved for the VA program.

In the opinion of competent finance men, RFC's brave new program for setting up private mortgage associations is virtually unworkable. Reason: the spread between what such associations could sell their debentures for (estimates are that it would be around 3 1/3 per cent) and the new low yield on FHA and VA mortgages would be too thin to make the operation feasible. As the plan would work, the only mortgages that the government chartered institutions could buy would be those insured by FHA or guaranteed by VA. The institutions would be permitted to issue debentures up to 25 times the paid in capital stock, would have to be capitalized at not less than \$1 million. Supervision of the program, including the granting of charters, would be lodged in Foley's hands.

## LAW

### DEMAND STRONG for business space and other real estate, NAREB finds

Last month the National Association of Real Estate Boards scanned the market and found a lot to be encouraged about. Tabulating the results of its 50th annual survey of 470 cities, NAREB reported:

•Overall volume of real estate sales of all types will equal or top that of 1949 in 72 per cent of the cities.

Demand for business space will continue at its present rate in 60 per cent of the cities; 19 per cent look for some relaxing, 21 per cent for stronger demand.

Used houses, which sold at a somewhat

lower level during 1949 in 87 per cent of the cities, will continue to settle in price in 69 per cent of the cities.

An adequate supply of usable home sites where utilities and streets are available still exists in 43 per cent of the cities.

### VA PROGRAM, with seven years to go, will house for 3.5 million more vets

As VA celebrated its sixth birthday last month, it counted up the home finance benefits still on its shelf. With seven years yet to go, only 1.9 million veterans-out of a total of 15 million-have availed themselves of its assistance in buying a house. VA guesses that 3.5 million more will buy before the GI Bill expires. Its guess is based on the assumption that, as younger veterans marry they will become homeowners in the same ratio that currently prevails for non-vets (54 per cent.) It also assumes that 20 per cent of the estimated 1.8 veterans who own homes but have not used the loan guarantee will use it in the future.

### VACANCY RATIO LOW in many metropolitan areas, BLS finds

Everybody had a set of figures to prove that the housebuilding market was still good and strong. Surveying unit vacancies in 24 big city-areas from December to February, BLS found a low enough vacancy rate (1 per cent or less in over half of the areas) to indicate that prospective house buyers still have only a limited choice in many important sections of the country. Below is a table of BLS' findings:

	Habitable units	For	For
Area	unoccupied (in	rent	sale
	per cent)	(in per	cent)
Pittsburgh	.8	.4	.2
Boston	1.0	.4	.1
New York	.8	.4	.1
Denver	1.5	.2	.4
Buffalo	1.1	.5	.1
Detroit	1.6	.5	.5
St. Louis	1.2	.4	.4
Cincinnati	1.6	.7	.4
New Orleans	2.2	.8	.3
Jacksonville	1.1	.7	.4
Portland, Me	2.1	.6	.6
Los Angeles	1.7	.9	.5
Birmingham, Ala.	1.4	1.0	.2
Baltimore	2.0	.9	.6
Portland, Ore	1.9	.7	.6
Minneapolis-St.			
Paul	1.0	.1	.2
Richmond, Va	1.0	.3	.3
Indianapolis	.9	.4	.5
Kansas City	.7	.1	.2
Chicago	.8	.4	.2
Atlanta	1.0	.4	.2
Memphis	2.3	.6	1.6
Mobile, Ala	3.7	2.0	.4
Savannah, Ga	3.4	2.7	.2



NEW NABOM OFFICERS stand behind retiring President J. Clydesdale Cushman. (Two vice presidents are missing.)



CONVENTION CHAIR-MAN was Andrew Steers of Seattle.



CANADIAN Philip H. Bruneau of Montreal is president of NABOM'S sister association.

NEW TOP THREE (I-r): President James F. Cook, Jr., of St. Louis, Secretary-Treasurer, Sterling H. Bigler of Philadelphia and First Vice President James N. Bradford of Seattle.



NABOM'S 1ST PRESIDENT (1912), John C. Knight, drove 6,000 miles from Florida to meet one of his old office boys, J. Clydesdale Cushman of New York City, NABOM's retiring president. Below, Lee Thompson Smith, modernization champion of New York (L), is buttonholed in the corridor by Executive Vice President Robert B. Beach, Chicago.



"Modernization is no panacea; but it is the

best defense against overbuilding." With this unanimous resolution 800 managers and owners of the nation's office buildings identified their No. 1 worry-and No. 1 weapon-at their 43rd annual convention last month in Seattle. For five days, members of National Association of Building Owners & Managers examined the health of the nation's sixth largest industry (\$10 billion invested). Save for the threat of overbuilding, they found it generally sound. Occupancy is down a trifle but still high-at 97 per cent. Average rental for 1949 was \$2.76 per sq. ft., a gain of 19 cents over the year before. Rental revenue had increased 71/2 per cent more than operating costs. "This I give you as reassuring news," said retiring NABOM president, J. Clydesdale Cushman.

But Clyde Cushman and other speakers also had less reassuring news:

\$520 million of postwar office buildings finished, under way or committed—is going up in 38 U. S. and Canadian cities. These 126 buildings aggregate 20,600,000 sq. ft., a third of which is already finished.

Spotty declines in percentage leases have made some owners and managers unhappy, though not yet alarmed. Clothing, shoe, candy, fur sales are off, some times as much as 50 per cent; and so are percentage leases.

Durban decentralization is a threat to existing buildings, but just how serious a threat convention speakers disagreed. Chicago architect Nathaniel A. Owings said: "The only way to protect this tremendous investment in the existing real estate and buildings . . . is to take radical steps to remodel basic city plans to make them work. We must re-create an environment in which people will be *willing to stay put* . . . ." Other speakers were less worried about the dangers of decentralization, and NABOM considered a full-scale survey of the problem.

Ninety per cent occupancy can no longer be considered "normal," declared rental expert Dale R. Cowen of Portland, Ore. A 7 per cent occupancy decline to "normal" would mean a 21 per cent fall in net income, he said (Depression figures showed that a 20 per cent loss in occupancy created a 36 per cent loss in gross income and a 66 per cent loss in net income-i.e., 1 per cent loss in occupancy means a 2 per cent cut in gross income and a 3 per cent cut in net income.) Cowen told the industry it had not yet recouped depression losses. Net income per square foot (after depreciation) was 98 cents in 1924; last year it was 85 cents-and meanwhile the dollar's purchasing power had plummeted. Though Cowen did not suggest rate increases, his mathematics showed that a 25 to 40 per cent rent increase would be necessary to boost net income per square foot to the 1924 level. Postwar building has "all the earmarks of being bolder and lustier than the notorious over-expansion that began around 1925," warned Lee Thompson Smith, president of the New York Real Estate Board. He pounded home the convention's theme: "What we want to stop is over-production."

Survival weapon. NABOM has long recognized the danger and long urged modernization as the survival weapon for older buildings. Just how well its members have taken this advice, not even NABOM knows. Year ago, they guessed \$175 million would be spent on modernization in 1950, but attempts to survey the industry have been unsuccessful. One member explained the difficulty: "You start with new elevator cabs. Then it is elevator doors. Then you've got to spruce up your lobbies to go with those new cabs and doors. So you might as well clean up the building's outside, shear off corners, smooth fenestration. And you stop only when you run out of money."

Privately, most NABOM members thought they collectively had spent or committed \$250 million on postwar modernization. Publicly, NABOM's executives were happy with the program—so far as it has gone. But Lee Thompson Smith warned that the office building boom appears to be continuing full speed ahead: "Your modernization and your preaching cannot stop new construction for large corporations which build their own structures when they do not find buildings with space big enough for them," he warned. "But your modernization will hold your smaller tenants and



FINAL BANQUET of steamed salmon was presided over by Toastmaster Andrew Steers, convention host.

BETWEEN SES-SIONS, Peggy Wolfe, Secretary of Pittsburgh's association, chats with Carl V, Elmquist, secretary of the Minneapolis branch.



thereby remove a demand for new buildings to house them."

Backing its words with action, NABOM's executives made the Association's Building Planning Service available for modernization. (Previously it has been available for new construction only.) The Service estimates new construction costs at \$25 per sq. ft. of rentable area; in the late Twenties they were \$15. By spending part of the \$10 differential, members were urged to make old buildings as modern as brand new ones, with increased rentals more than paying fixed charges and amortization.

How to handle tenants during modernization work, while elevator service is disrupted and contractors are littering corridors? NABOM speakers had the answer: public relations. The Morris Building in Philadelphia distributed two booklets to its



VACANCIES AND NEW BUILDING charted by Speaker Lee Thompson Smith dramatize fact that the Manhattan's vacancy ratio exceeded 10 per cent during 13 of the last 26 years.



MILK BAR TOASTERS (I-r): J. C. Chuck, Long Beach, Calif., Maynard Hokanson, Indianapolis, a vice president, James M. Bradford, Seattle.



AT COCKTAIL PARTY Mrs. Thelma Martin (I), secretary of Kansas City Association, holds attention of Gladys M. Ellis, Kansas City building manager, Mrs. Bradford W. Young, San Francisco, who owns Kansas City building managed by Mrs. Ellis, and Ray Scheetz, Seattle building manager.

tenants (total cost: \$750) when its elevator service was cut in half during modernization; one explained the program, the other contained cartoons humorously forecasting tenants' troubles and comparing them with those of the henpecked husband whose wife is constantly rearranging the living room. As part of good public relations, managers were urged to explain rent increases personally, not by impersonal mail. They were warned not to be forced into rate-cutting by shortsighted owners who fret at vacancies. Continued Sterling H. Bigler, manager of Philadelphia's Girard Trust Co. building: "A 10 per cent vacancy is better than a 10 per cent overall reduction in rent."

Proving they were in a modernizing mood themselves, delegates elected as their new president white-haired, pipe-sucking, James F. Cook Jr., whose St. Louis firm has been preaching and practicing modernization.



VACANCIES AND TAXES plotted by Smith show that \$80 million of real estate taxes were paid on Manhattan's vacant office space between 1925 and 1947.

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Above, STRIP: Center, BLOCK: Bottom, RANCH PLANK





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Old Mosque of the Sabres at Kairouan (see p. 30)



New Military Cemetery at Carthage-Gammarth (see p. 22)

New Market at Bizerte-Zarzouna (see p. 26)



## REPORT FROM TUNISIA by G. E. Kidder Smith

Tunisia — past, present and future — is the land of the arch, the vault and the dom It is also the workshop of the most advance modern architecture and urbanism in Nort Africa and the home of the most extrao dinary native construction this side of the moon.

Because Tunisia for centuries has no had even the meager supply of wood foun in Algeria and Morocco, masonry and ma sonry alone has been the constructio means. Stone, brick and concrete are raise to rare heights—in most cases without ever wood columns, bracing or centering.

Moreover, since Tunisia was considerabl devastated during the war (remember Kas serine, Pont du Fahs, Cape Bon?), a larg amount of reconstruction had to be done to provide even basic shelter for many people Bizerte, for instance, was 50 per cent de stroyed. There is, therefore, an architec tural activity in Tunisia rare around the Mediterranean, and one per force based on construction techniques refreshingly original to the American mind whose architectural specifications can command any material in any amount. If most of us were faced with a stack of bricks or a pile of stone-nothing more-and told to build, we could do no better than refer to Tunisia.

The French administration was wise and Tunisia was fortunate in that the problem of reconstruction was attacked as an overall problem and planned thus from the beginning. No higgly-piggly nibblings were undertaken. At Bizerte, for instance, a master plan was molded, shaped and refined before any construction commenced. Thus, instead of rebuilding on the old sites and to the old archaic street pattern-as the French in France did after World War I and are largely doing after World War IIa new city, Bizerte-Zarzouna, is being erected across the river. And instead of having one architect here and another there build local schools, dispensaries and native houses to replace those leveled by war, master standards were drawn up, products of the best architectural minds available.

This all-inclusive study of the needs of the country (which is about the size of New York State with a population of roughly 3 million) was fortunately delegated to an extremely capable and energetic young (Continued on page 22)

<sup>\*</sup> The third in a series of architectural impressions of European and North African countries, this is a report from Architect-Author-Photographer G. E. Kidder Smith, who is visiting these countries (with the aid of a President's Fellowship from Brown University) to study and photograph their native and contemporary architecture.

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Government building at Bizerte

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## REPORT FROM TUNISIA

French architect, Bernard Zehrfuss (1st *Prix de Rome*) and an admirable group o associates. Most of them came from Franc for the purpose. Their imagination and the quality of the work they are doing are the highest in North Africa.

Unquestionably the finest—and saddes —of all new work is the superb Military Cemetery which Zehrfuss did (in collabora tion with R. Dianoux) north of Tunis a Carthage-Gammarth (photo, p. 18). This is possibly the most inspired architectural



Cemetery at Carthage-Gammarth

realization of World War II, from its very location—which the architect himself selected—to the sensitive curve and counter curve of its terraced hill. Here in sight of the crumbling remains of ancient Carthage, with a view over the Mediterranean on one side and the Lake of Tunis shining in the afternoon sun on the other, is war's supreme resting place. This necropolis is of a unique quality: all else in Tunisia follows at a respectful distance.

The next most interesting building is the still unfinished Regional Government Building (Controle Civil Regional) at Bizerte-Zarzouna by Jacques Marmey (photo, left above). This multi-vaulted office and reception center, overlooking the sea and old Bizerte, is one of the key units in the new plan for the city. Its commanding location and beautiful view fit it well for the administrative-entertainment center that it will become. The emphasis on entertainment comes from the importance of Bizerte as a port and the frequent visits of dignitaries and French and foreign navies. The main office wing is at right angles to the reception hall and salle des fetes which faces the view but also the windy exposure. Although there is a certain lack of clarity and cohesion in the building, it is still a clever conception, and one which well bridges the construction techniques of the past (it was built locally and without special labor) with the space and use concepts of today.

(Continued on page 26)

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REPORT FROM TUNISIA

The new Tunisian markets are furth expositions of the felicitous marriage old-material-and-local-labor with new thir ing and needs. One of the largest and be of these is that down the hill from the Re ional Government Building and design by Zehrfuss, Drieu and Kyriacopoul (photo, p. 18). Planned around a gard court, the numerous stall-shops are service from the outside, leaving an inner cover

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Market at Kairouan

promenade. Construction is of vaulte brick set by local labor without centering Smaller markets, based on multiple dom construction instead of vaults, are found a Kairouan and Sidi-bou-zid (photo, above)

Numerous new small schools have bee built in Tunisia, a two-classroom standard ized type having been erected in 25 rura communities. The larger editions are, how ever, more stimulating and among the bes is one for boys by Kyriacopoulos at Bizerte Zarzouna, facing the covered marke (photo, left, above). The school has si airy classrooms, all of which face direc south and are protected by a deep cantilever

A small apartment, canteen, showers and atelier at right angles to the class bank complete the plan. The north face, toward the street, is completely blank except for high clerestory windows.

A contemporary conception of living is found in the new apartment at Cremieux ville, outside Tunis (photos, top of p. 30) These walk-up balcony-access building are fully up to date, well planned ho weather flats. One of the best features of the plan is that each floor landing gives access to only two apartments (all of which are identical). By this means the balcony becomes a private outdoor living area instead of a public thoroughfare. It is therefore located on the south to catch the sun (and protect the rooms beneath by its overhang) instead of the north which is usual for the balcony-access type.

(Continued on page 30)

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### REPORT FROM TUNISIA

The native architecture from which mu of the new work sprang—the architecture the arch, the vault and the dome—is many respects one of greater unselfco sciousness, greater directness than most that being done today. The vernacula buildings in Tunisia are of enormous stim lation, and as lessons of what can be don in stone and brick they are supreme.

Among the most provocative are the mo ques. The best (but not necessarily the largest) of these are found on the picture que Isle of Djerba, off the southernmost



coast, and in Kairouan, one of the sacred cities of Islam, in central Tunisia (photos, below and p. 18). Even the largest of these mosques are not without local architectural influence, while the smaller, more interesting ones have little inspiration from the soaring domes and needle minarets of Istamboul, Cairo and Isphahan. In date the Tunisian mosques range from the eighth to the eighteenth centuries.

Somewhat akin to the mosques—a relation stemming from rather similar roof construction—are the fantastic *ghorfas*. These extraordinary storehouses, found mainly in the Médenine-Métameur region in southeast Tunisia, are the centuries old prototype of our own quonset hut, for they look like nothing more than rows of masonry quonsets stacked three to five deep on top of each other. Although they were originally built to store grain and other be-(Continued on page 34)



Mosque El-Gheriba on Djerba

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#### REPORT FROM TUNISIA

longings, in recent times many have served as habitations and workshops. In general they were built around squares of varying shapes, the access doors opening only onto these squares while the rows of blank rear ends served as a wall around the outside.



Ghorfas

Construction is of field stone and clay mortar built to a parabolic shape and erected without centering. Access to the upper floors is by means of steep and delightfully irregular steps or series of niches. As a matter of fact much of the appeal of these towns lies in the absence of machine precision and regimented planning for a series of virtually identical products. By subtle variation only of angle, size and placement of the same basic unit, a harmony, accent and rhythm have been created where many have merely produced monotony.

Although the fascinating villages made of these weird *ghorfas* are among the world's most eurious, the world's most unique (to "plu" the pluperfect) is the troglodytic Matmata, not far from the *ghorfa* country. Here the poor inhabitants, having *nothing* to built with, build into the ground instead of upon it. They excavate roughly circular craters to a depth of 10 or 15 ft. with a diameter of perhaps 15 to 20 ft. At the bottom of this they hollow out their rooms and stables from the sides of the crater wall and dig their well in the center. With





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buildings, illustrated above, at Lebanon, Pa. A number of added buildings (approximately 16 not shown above) complete this \$15,000,000.00 hospital group, of which about 30 buildings of various sizes are now serving veterans.

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### **BEHIND THE BLUEPRINTS**

campus (p. 86).



**EERO SAARINEN** has managed to carve out his own fine reputation in the vast shadow of his famous father. Born in Finland, young Saarinen came to the U.S. in 1923, studied architecture at Yale and sculpture in Paris. From his Bloomfield Hills office near the Cranbrook Art Academy have come countless premiated designs plus a new church (p. 80), done with Hill, Gilbertson & Hays.

Architect BRUCE GOFF'S bold, strikingly individ-

ualistic designs are indigenous to his own native midwest. He spurned formal training for a job

in the Tulsa office of Rush, Endacott & Rush and

in 13 years was an architect, a partner and

still only 25. Last year he became Chairman of the University of Oklahoma's School of Architec-

ture, has since designed a daring chapel for the





KARL J. HOLZINGER, JR., FRANK ER-HART, EDWARD D. STONE and HOWARD EICHENBAUM comprise the Little Rock-New York design team responsible for the University of Arkansas' handsome new Medical Center (p.

90). Erhart and Eichenbaum have practiced architecture in Little Rock since 1939 (with John Rauch since 1945). Previous hospital experience includes a tuberculosis sanitarium consisting of 26 buildings and a 500 bed hospital. Edward D. Stone hails from Arkansas, is a New York architect of note, has designed such well-known structures as the Museum of Modern Art and the new El Panama Hotel now abuilding. Holzinger, his nephew and associate, studied architecture at the University of Illinois.







JOSE LUIS SERT was born in Barcelona, Spain, where he studied and, except for a year in Paris with Le Corbusier, practised architecture until 1938. He came to the U. S. in 1939, has written and lectured extensively on town planning and executed master plans for several South American cities. He has also done some individual house design, such as the interesting remodeling on Long Island, with Robert Rahman (p. 96).

Architect HUSON JACKSON is Pennsylvania-born and Harvard-trained, received his master's degree in architecture in 1939. He served his apprenticeship in the offices of celebrated modernists Gropius and Breuer, and Charles Eames, later collaborated with Carl Koch. Since the war Jackson has practised in New York (accent on residential design, p. 99), is associate professor of architecture at Pratt Institute.

Architects FRED M. GUIREY and HUGH E. JONES are an east-meets-west combination with headquarters in Phoenix, Ariz. Guirey is the westerner, born and educated in California, and, alternately site planner and independent architect in Arizona. Jones was born in Washington, D. C., studied architecture at MIT, worked in Skidmore, Owings & Merrill's New York office. The Phoenix school (p. 110) is a recent joint project.





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### LETTERS

#### **ARCHITECT AND BUILDER(continued)**

In its April issue (p. 117) the FORUM propose that the Architect and Home Builder get togeth on the design of small houses, for their mutu benefit and the benefit of the average America family. President Thomas P. Coogan of th National Association of Home Builders an President Ralph Walker of the American Inst tute of Architects, in the same issue of th FORUM, expressed their agreement with the proposal and their willingness to meet each othe half-way to evolve methods of work and profes sional remuneration which would help pu FORUM'S proposal in effect.

Last month while NAHB was still waiting for AIA to set a date for the proposed meeting, archi tects across the country continued to write FORUM, expressing their agreement with the proposal and urging action. Following are excerpts from a few of their letters:

#### Forum:

I am particularly interested in your attempt to develop better relations between the operative or merchant builder and the architect. This intraindustry relation is something that, in my opinion, has been necessary for some time, and it is encouraging to see your publication taking the initiative in attempting to develop same.

I would like to offer a pertinent point. You mention that many architects refuse to budge from the standard fee. This, I believe, is somewhat of a misstatement. It may not be known generally that the AIA sanctions and encourages professional services on the basis of cost of production and a fixed fee for the architect. Using this system as a basis for professional charges, the merchant builder could employ or retain excellent talent, establish his own budget for architectural services and stop at any point that he feels he has sufficient documents and/or services. This office and several merchant builder clients have found this very workable, and I am sure you will find this rather well received.

My compliments for the liaison work you are attempting.

> HERMAN CHARLES LIGHT, Architect Los Angeles, Calif

#### Forum:

... I hope it will start something, if only a hair-pulling contest.

My practice is mostly residential and from time to time I get inquiries from builders who usually want anything that is "different" for a nominal fee. I hope your issue has explained to them better than I have been able, the value received from carefully and competently studied work.

I think your thesis can only be solved by either having the architects work for the contractors directly, or as architects, entirely. Either all types of work shall be given full and competent study or have the architects give "salesmanship"

(Continued on page 44)



SLEEK, graceful 100 Park Avenue points an impressive finger skyward in mid-Manhattan. And this fine new 36-story office building is another big Gold Bond job. Gold Bond metal lath, plaster and acoustical plaster were used from the ground up.

Everybody concerned - architect, builder and owner-is saved a lot of headaches when Gold Bond products are used on a job. That way there's one reputable manufacturer-National Gypsum Company-responsible for the performance of all the materials used. There are now more than 150 Gold Bond building productseach guaranteed to do a specific job better. They're fully described in Sweet's and available through Gold Bond lumber and building supply dealers across the country.

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### LETTERS

service to builders. Two types of work and t fee scales cannot get along together.

If everything was done by competent architec there would be no question of fees, just as the is no question about the cost of a bath tub. Th should both be expected.

> LAMBERT JAMES SOUCEK, J Architect & Engineer Hinsdale, Ill.

#### Forum:

Your remarks on the average architect's at tude being Pharisaical are in character.

I think your editorial comparison to doctors bit misleading, however. A person goes to doctor with the idea he will be billed, and w pay unless he is indigent or a dead beat. Ve few, if any, consider such a thing when enterin an architect's office. A doctor rarely goes throug a profit-taking middle man. Now, the housing which you speak is being built by a wide rang of skilled and semi-skilled builders or "oper tors," with the idea of a profit and not with th idea of helping out a distressed human being of family (except in most unusual circumstance with which we are not primarily interested If a builder expects a profit, why shouldn't a architect or engineer who has probably sper far more on becoming established than th builder, albeit usually less than a doctor? Th current reasoning seems to be that the ownershi of a house or property is still a luxury, whil infirmity or disease is largely accidental, its car a requisite.

Mr. Coogan's and Mr. Walker's remarks ar good so far as they go, but I doubt if either i honestly aware of the problem as it would affec himself. Both are too far removed from the field of "battle." Committees of men in direct touch with the problem would be a fine thing....

Frankly, I would like our office to spend from 10-20 per cent of its productive time helping to build new areas with honest production-linbuilders, and to do it for very nearly cost, or a close to cost as the builder, provided that architects and engineers could make site plans, al building plans and supervise the construction of a cost-per-hour-per-man basis....

Your editorial is a mightly fine ice breaker E. A. WEED, Architec Honolulu, Hawaii

#### Forum:

... At the moment this is still the most press ing problem in the construction field.

In my opinion, millions of dollars of investors money is being wasted due to poor planning and construction details incorporated by operative builders in their tract houses. I am not condemn ing these gentlemen unduly, but rather feel tha they are doing their best—not knowing any bet ter—and the architects certainly have made no attempt to enlighten them.

During the Thirties I performed services for the Home Owner's Loan Corp., reconditioning (Continued on page 48)



Tomorrow's teachers preparing at Cortland State Teachers College, Cortland, New York, will occupy three Georgian style buildings now being constructed of the most modern materials to insure permanence as well as architectural beauty.

An important example of this upto-date building technique is the installation of 130 tons of J&L Junior Beam floor joists. Architect Carl W. Clark, selected Junior beams as the result of a continuous study which he conducts on the cost of materials and the relative economy of design.

**Cortland State Teachers College** clearly demonstrates the practical advantages of Junior Beam construction. Syracuse Engineering Company cuts Junior Beams to length-delivers them to the job with clip angles welded to the ends: Workmen are able to speedily position the lightweight Junior Beams by hand, enabling brick laying and wall construction to proceed without delay.

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(1) Close-up of a ceiling after the GPX Concrete Forms have been removed.

(2) Smooth finish of completed ceiling after the fins shown above have been ground off and smooth concrete surface has been painted.



Lester Patterson Houses, another example of how progressive contractors can keep costs down by the use of GPX Concrete Forms.

\*The architects on the projects listed above were: S. K. Strauss Walker & Gillette Govanus-Candela, Kahn, Jacobs and McCarthy Governor Alfred E. Smith-Eggers & Higgins Lester Patterson-J. F. Dalany J. W. O'Connor A. Embury II M. W. Del Gaudio Astoria-Harrison & Abramovitz Queensitev-George Brown Bernard Guenther One of the most important recent developments in the construction industry has been the acceptance and extensive use of Georgia-Pacific's plastic-faced plywood, GPX, for Concrete Forms. Their economy in use, handling and maintenance is, today, serving to keep costs down on construction projects everywhere.

everywhere. Willcox - Bein - Fish - McHugh, alert New York contractors, use GPX Concrete Forms exclusively for ceilings. Ceilings poured into GPX Forms are ready for painting after only a minor grinding and smoothing operation instead of the customary 3 coats of plaster finish. In addition, one GPX Form will maintain its smooth surface at least three times as long as forms made of ordinary plywood. WILLCOX-BEIN-FISH-MCHUGH REPORT THAT ON LES-TER PATTERSON HOUSES, TO GET A COMPARABLE CEILING WITH ODD TYPES OF FORMS, WOULD HAVE COST \$50,000 TO \$100,000 MORE THAN IT DID WITH GPX CONCRETE FORMS. Willcox - Bein - Fish - McHugh first

Willcox - Bein - Fish - McHugh first used GPX Concrete Forms when working on the construction of Manhattan's well-known Jacob Riis Houses. Since that time, these progressive builders have used GPX on the Gowanus Houses, Section One of the Governor Alfred E. Smith Houses, Lester Patterson Houses, and Queensview Houses.\* About to be started by this firm is Section Two of Astoria Houses. Of course, GPX Concrete Forms will be used!



47

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### LETTERS

and modernizing homes that they had foreclosed At that time it was obvious that houses whic were designed by architects lent themselves mor readily to repair and modernization than house which did not have benefit of architectural ser vices. The clincher was that the architect-de signed house sold faster and at a higher price.

I believe that a schedule of fees could b worked out which would be profitable to the architect and of inestimable value to the operative builder. In view of my own past experience, am sure it could be proved that retaining an architect for tract houses would result in innumerable savings to the builder.

The following is a suggested fee schedule:

1) Ten per cent of construction cost for each basic unit, the architect to supervise to complet tion in order to determine errors and best con struction methods in cooperation with the builder

2) Three times drafting cost for additiona units, which would cover revision of site plans reversing plans, different architectural treatment

3) Agreed-upon additional nominal amounper house, which would represent a small profit for duplication of units upon which the architect performs no direct services. This could be as low as \$10 to \$20 per unit in large developments.

> MALCOLM D. REYNOLDS, Architec Reynolds & Chamberlain Oakland, Calif.

Forum:

We are in complete agreement. . . .

At the present time we are working on preliminary drawings for housing projects for several builders. We all feel it is possible to produce well-designed small houses on a fee basis which is reasonable for both the builder and the architect.

It appears to us that fees based on drafting costs plus a small royalty for each house built could work out very favorably for all concerned.

> HOWARD L. COOK, Architect Wimberly & Cook Honolulu, Hawaii

Forum:

... The builder and the architect have a long road to travel, and it must be traveled cooperatively before we can point with pride to the overall results of this collaboration.

Having lived for many years in one of the fastest growing sections of the country, I believe that I have seen first-hand all of the evils that can be perpetrated by the thoughtless development of large subdivisions. The part that hurts my sensibilities the most is the fact that such subdivisions are gobbling more and more of the Southern California landscape and for the most part are using it in the same manner that they have been using it for the past three decades. Among the foremost mistakes that are being made over and over again is the poor site planning, the rows upon rows of small lots with narrow frontage facing on street after street in the familiar gridiron pattern with the whole drab and uninteresting mess garnished with telephone (Continued on page 52)

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and power poles as far as the eye can see. I ca only hope that the voice of your April issue wi reach into every corner of the building professio and at least awaken a new sense of inquiry an responsibility where, I am sure, none has flour ished before....

> ARTHUR LAVAGNING, Architec Pasadena, Calif.

#### Forum:

... It is high time somebody came out with workable solution; and your proposal does de that.

Congratulations on your editorial and you excellent small house issue.

> SARKIS M. ARKELL, Architec Albany, N. Y.

#### **APRIL'S HOUSES**

#### Forum:

The recent small house issue (Apr. '50) has rendered a most important service to architecture The bringing together of a vast number of ideas on how small houses can be made better place in which to live is of infinite value. The inevitable incorporation of the many fine suggestions your publication contains is, no doubt, going to im prove small house building throughout the country. Congratulations!

> WALTER F. BOGNER, Architec Cambridge, Mass.

Forum:

. . . This is one of the finest displays of homes in the interest of the home building industry that ] have ever seen. . . .

> CLAYTON W. JOHNSON Executive Secretary Home Builders Assn. of Hartford County Inc West Hartford, Conn.

#### Forum:

Since you did not have the following informa tion, a wrong impression was given in your presentation of the Balch projects in the April FORUM. In presenting "The Chiarelli and Kirk House" and "The Ridley House," the distinction should have been made that the first one is a freely and completely designed leader made possible through the sponsorship of industry (two were built); while the second represents an actual builder's project of 50 fast-selling economy houses for which architectural work consisted of the more usual FHA minimum plans, unsupervised and subjected to improvisations during construction.

These improvisations on the job, which make the term "Ridley House" inaccurate, include combinations of horizontal and vertical siding, chimneys and "stock" fireplaces inserted, carport roofs altered, and open gables closed up. The most economically available stock trim and detail was used throughout. We are working towards the demonstration of the value and economy of more complete details and supervision in projects such as this.

> JOHN RIDLEY, Architect Seattle, Wash. (Continued on page 54)

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### LETTERS

#### HUNG CEILING AT CHARTRES

#### Forum:

FORUM has presented some of the most interesting and advanced examples of contemporary work. I have become increasingly aware, however, of a trend in the critical standards which tends to confuse dramatics with straightforwardness, the *tour de force* with a really good solution, and the prestige of a project with its over-all worth from the architectural point of view.

Nothing illustrates this trend so well as the presentation of the Caribe Hilton Hotel and the Palace Hotel in the March issue. I pick little quarrel with the eulogies to the Caribe Hilton, but I fail to see by what criteria of judgment the editors, in practically the same breath, could praise the former and honor the meretricious ostentation of the "new" Palace. The dreary film of mediocre "modernistic" to my mind is no improvement over the old building which, for all one's personal feeling about Victorian architecture generally, at least had style, gaiety, and was an honest expression of its times.

Furthermore, to pick only one example, the dreary sheath over the marble columns, is hardly consistent with the philosophical concept of materials honestly used, which seems to me to be one of the criteria by which to judge the architecture of all times. Nor, from a more general point of view, do I see anything in the use of materials in textures or detailing which relieves the monotony.

If mediocrity and sameness are an expression of this age, perhaps this is good architecture, but surely if the public demands no more, it is up to the architects and to the architectural publications to raise the level of endeavor and to discriminate. Let us leave what is valuable of the past and encourage only the best for the future.

> JUDITH C. SKINNER Boston, Mass.

P. S. The two buildings are hardly analogous, but can you imagine praising a hung ceiling in the Cathedral of Chartres!

• In a backhanded way this letter grasps FORUM'S purpose, which was to contrast the sharp brilliance of Warner-Leeds' new Caribe with the warm rich glow, the deliberate understatement, of McCarthy's totally different approach to a totally different situation in the Palace. Though the editors pretend to no infallibility, they do nowadays visit every important project they report, before writing about it; they found the Palace neither dreary nor ostentatious, and suspect that any such impression must be laid to somewhat lackluster photographs. Let Reader Skinner herself beware of dogmatism, however. The Palace columns which she loads with sin are almost identical with those of Caribe which she admires (cf. pages 100, 107, Mar. FORUM) except that the Palace's lacquered goldleaf finish will probably outlast and ultimately outshine Caribe's flat paint. At the risk of offending some, FORUM will continue to report intelligent departures, in varying degrees of success, from what threatens to become Cliché Road.-ED.

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# Straight thinking vs. cribbed design

There is grave danger that contemporary store design in this country will quickly degenerate into a style rather than an intelligent application of new means to the solution of new problems.

Already too many merchants—and too many architects who should know better how to advise their clients—are putting open fronts on stores where good sense would warn that more privacy rather than less would help make a sale. Too many merchants are flooding uncontrolled daylight into the front of their stores without realizing glare can kill sales faster than light can stimulate them. Too many merchants are following the no-window vogue for the upper floors without asking whether housewives will buy their particular wares without first seeing them by daylight. Too many stores, in brief, are imitating other stores without taking time to understand what they are imitating. The design of too many stores is becoming a matter of style—the unthinking imitation of imitation.

Not long ago Architect Morris Ketchum was surprised to find in a southern city a direct copy of a store he had designed for a northern center. In the North the original has been outstandingly successful. In the South the copy was a flop. It failed because it had borrowed only the form instead of borrowing the thinking behind the form. And the same thinking that led to the form used in the North would have indicated a very different kind of store for the South.

Of all the arts, architecture alone must meet the test, not alone of beauty, but of efficient, effective service as well. The reason for this is clear: architecture is also the most costly of the arts. In all history there never was a \$2 million painting, or a \$2 million sculpture, or a \$2 million piece of music. But a \$2 million building is a commonplace in every city. Because architecture alone can flourish only at great cost, architecture alone is required to meet part of its own cost by adapting form to *function performed by others*.

Stores feel this economic pressure for an architecture that works and pays dividends faster than any other type of buildings, for the very reason that competition is sharpest and quickest at the retail level. That explains why stores (and others dealing directly with the public, like theaters and restaurants) were so quick to reach for modern design. In fact, they reached so fast that thousands of stores snapped up "modern" features faster than they could understand what they were getting. Now it is high time they paused a moment to take stock, for some modern features make sense for one store, others make sense for others.

We hope the study of Tomorrow's Stores on the pages that follow will help architects, builders, and merchants to a better understanding of reason in retail architecture. And we are deeply grateful to Victor Gruen, Morris Ketchum, Morris Lapidus, Daniel Schwartzman and Kenneth Welch for the time they have spent working with our editors to make this a definitive explanation of contemporary design, not as a style, but as a truly functional architecture.

This month's article deals only with the downtown store. Next month we will take up reason in shopping centers—and why the isolated branch store in the suburbs is headed for trouble.

# WHAT MAKES A 1940 STORE OBSOLETE?

How glass, air conditioning, high intensity lighting, better acoustics, new fixturing, costlier labor, shopping centers and more prosperous customers have re-shaped the modern store —a study made in collaboration with Victor Gruen, Morris Ketchum, Morris Lapidus, Kenneth Welch, Daniel Schwartzman

Gruen

Ketchum

Lapidus

Schwartzman

Welch



In the last ten years more has happened to downtown sto design than happened in the previous hundred. At the sau moment, the downtown store was socked on one side by profound change in income distribution and in buying hab and on the other by the emergence of a dozen new buildi technologies.

Each one of these precise new technologies called for major re-thinking of store design. Air conditioning alone ca be said to have re-shaped every element of the modern stor beginning with the building front and ending with the displacase. Modern lighting, low cost acoustic materials, lightweig curtain walls, flexible ceiling and partitioning—none of the tools were yesterday at the disposal of the store planner. Toda they have made almost every 1940 store obsolete.

These changes have come so fast that even expert sto architects have had a hard time keeping abreast of all the implications. When changes come slowly they can be multe over and digested. But when everything about a store chang overnight, considerable mental indigestion is inevitable. As result many stores that look contemporary really have nothin but a skin deep coating of "modernistic" design. To sort o the manifold impacts of these economic and technologic changes, and to show why store design must always be mon than "looks," the FORUM asked the help of the five top stor architects listed at the left. The review on the following page (illustrated, for the most part, in the expert laboratory of th specialty store) has been done with their collaboration.

Although the pace of store building and modernization habeen rapid since the war, increase in buying power over the last decade has actually come faster than additional stor space could be built to accommodate it. While the downtow merchant joyfully counted the onrushing customers, he als had to face the fact that the automobile was carrying an ir creasing number of them to the outlying suburban shoppin centers which enterprising developers were already putting u by the dozens. Merely to hold their own in the sharpenin fight for the shopping dollar, downtown merchants were now obliged to re-plan and modernize as they never had before

If the customer was on the move at a rate to make even th chain variety stores nervously reshuffle their old confidence in "100 per cent location," he was also a new kind of customer The over-riding fact about store planning today is that mor people have more money to spend for more things than the have ever had before. The great war and postwar redistribu tion of income has brought profound changes in retailing methods. The once clear-cut distinction between mass merchandising and luxury selling is no longer quite so clear the "mass" seems to have moved up from the basement and into the fashion-conscious specialty store while the tax-ridder "class" market occasionally can be seen at the bargain counters. Fashion itself, only yesterday the prerogative of the upper-income group, is now demanded by all buying groups, and this requirement has spread from apparel to almost all merchandise lines.

While the customer has more money to spend for shopping

than ever before, he also has less time. This is not only because the sheer numbers of him that now occur in city centers reduce his net exposure to almost anything he seeks or because the journey to the suburbs further cuts the time available at either end. It is also because he—or, more importantly, she—may now prefer to look at television or even plant a garden around her suburban house to that once pre-eminent diversion of "shopping." By and large, the customer seems to have transferred his demand for the leisurely and personalized shopping attention that yesterday recognized "quality folks" to a demand for the quality merchandise which mature mass production has made widely available.

#### The great vanishing act

It was these factors-more people with more money and less time-and no mere caprice executed on architectural drafting boards, which took the wall off the street side of the downtown store and produced the well-known "open front." The same factors, more clearly recognized and exploited by skilled architects, are now producing what Architect Morris Ketchum calls the "great vanishing act" in store design. This simply means that, one after the other, the traditional elements of the store interior have literally disappeared in favor of maximum visibility for the merchandise itself-the building line vanished into the recessed store front, the sales counters shrunk to hook strips in the wall, island fixtures were reduced to skeleton forms clothed in merchandise, the lighting fixtures were recessed into the ceiling, the ceiling and walls themselves began to be replaced by easily removable, drybuilt panels.

For retailing's new customer, with little time and less interest in the old *haut couture* type of selling, the vanishing store has had the happy result of putting as few obstacles between him and the merchandise as possible. For the store owner, the vanishing store has had the equally happy result of cutting many costs. What you don't build, you don't have to pay for and you don't have to maintain. Moreover, most retailers found that the new expertly lighted "self-selection" counters and racks enabled them to sell twice as much with half the clerks.

#### Rise of the specialty chain

Credit for sponsoring the rapid design changes that have shaped the modern store goes to the specialty merchandiser. The rise and development of the specialty store over the last decade is in itself a mirror of what has been happening to downtown retailing. While the specialty store was an early answer to the problem of congestion in the big department store, for a long time merchandisers believed that only the rich could afford the greater ease of shopping in a smaller store where considerable pre-selection of lines had already been made. Thus the specialty store for a long time connoted "personalized" or luxury sales methods as well as specialized merchandise lines. The rise of the big specialty chains demonstrated that there was more than one price target for this kind of merchandising —that the specialty store could, in fact, pick any one of the three major income divisions and plan its store and merchandise accordingly. Meantime, as the sharp divisions between income groups themselves wobbled, some enterprising specialty stores began to make the best of both merchandising worlds—that is, they found out how to use the myriad resources of modern design to put even very high-priced merchandise out where the customer could see it and feel it.

Self-selection—the chance to see and compare all the types of stock available—has moved out of the bargain basement and on to the \$10 tie counters of elegant Fifth Ave. men's wear stores. The architects are showing that cost-cutting self-selection and self-service methods can be accomplished without sacrifice of the ease and elegance demanded by even a luxury store. This is one of the biggest increments of the last decade's revolution in store design—the skills of modern design have substituted the luxury of a controlled physical environment for yesterday's luxury of service. Modern design has also been able to extend this new kind of luxury — the luxury of service by *things* instead of by *people* to a shopping environment for practically all income groups.

#### Mechanical revolution

By last year the specialty store was taking 51 cents out of every dollar spent for women's apparel and 67 cents out of every dollar spent for men's wear. Struggling to hold on to their dwindling share of the apparel dollar, the big department stores were adopting the design innovations pioneered by the specialty store and creating a series of "stores-within-a-store" to offer their customers the same advantages. Moreover, the department stores were busy with another kind of building revolution.

If the specialty stores were responsible for the great vanishing act in store design, the department stores, on their part, had been forced within the last few years to initiate an equally fundamental change in their methods of handling goods. This perhaps can be said to have begun when Fred Lazarus of Federated Department Stores saw his No. 1 merchandising problem as cutting down on the 10 cents out of every buying dollar which goes for the cost of warehousing and delivering bulk goods. Lazarus hired the Austin Co. to build him a mechanized warehouse. This was so successful that experts now say that the place to start department store design is in the warehouse. Since then, the mechanical revolution has been widely extended into the store itself.

Chances are that the revolution in department store planning has just begun. Says Victor Gruen: "Downtown merchants must now cooperate with city planning boards and other real estate interests in rehabilitation of the whole downtown area. There must be cooperative effort among merchants to provide parking and off-street unloading and to clear the slums that are choking the business center."

# THE VANISHING STORE FRONT

#### When does an open front cut inside visibility? How can you help shoppers see in the window? Can the open front move to the suburbs?

There was a good reason why the specialty merchandiser was so quick to assist the architect in opening up the store front. Unlike the big department stores, many smaller merchants do not buy radio and newspaper advertising to bring customers into the store. They have to start selling right on the street, and they were only too happy to enlarge their display windows to cover the whole store front. They also saw the advantage of recessing the building line into an exterior lobby where skillful display would draw window shoppers right to the entrance door.

On what should be seen through the open front, the merchants suffered-and still suffer-some conflicts. By dropping the bulkheads and carrying glass right down to the ground, the architects had converted the whole store interior into one brilliant display case. But the non-advertising store owner believes that nothing else works so well as merchandise in getting customers into the store, and he still wants a place where he can "play fast-sellers on the nose." It is interesting to note that practically all first-rate current examples show how thoroughly the open front has been re-worked to meet the merchant's varying needs. Small movable display cases precisely planned for all-small-goods items are now being moved up against the large windows. The skillful architect disposes these cases with immense care to retain the look-into-the store picture above and around them. Screens or drapes are now often provided for completely closing the open front for occasional display variation. Where the store operation calls for careful selection of highpriced merchandise, the direct view may be blocked, with openness introduced only above eye level.

The recessed store front proved to have many advantages. It 1) pulled the sidewalk right into the store; 2) gave the window shopper a place to stand without blocking street traffic; 3) provided up to three times as much window display space as the old store front; 4) proved economic for the typical small store building lot, a narrow section with length usually in bad proportion to width; 5) caught the pedestrian's eye better than windows parallel to the street.

The open front brought some new problems. Where glass expanse was very large, it was necessary to protect against window condensation and guard against excessive heat loss. In Ketchum, Gina & Sharp's famous New York Florsheim store, for example, supply ducts were installed at the bottom of all glazed store front openings, and the base molding of the windows designed as a plenum, permitting hot air to rise all along the glazing. Because the lobby is now on the outside instead of the inside of the store, doorway heating grilles or heat sources in the ceiling are usually used to counteract the cold air stream from the opening door.

When the architects had succeeded in opening up the store front, they made one dismal discovery. On a bright day, all that the shopper could see in the splendidly open front might be a reflection of a passing bus or the building across the street. The open front had handed the architect a much greater glare problem than the old shallow windows had presented. Various devices — window lighting, awnings, covered sidewalks, dark painted overhangs — are used to





RECESSED FRONT must be adapted to specific site. Here the angle of slant places two main display windows (l.) to catch eyes of pedestrians approaching from hotel off right. Door is moved off-center to provide more unbroken display space, but in this case the architects have shielded it from adjoining service alley by smaller display window (r.). I. Miller Shoe Store, Washington, Carson & Lundin.

DEEP EXTERIOR LOBBY is logical for this long, narrow lot. View-through front is combined with raised display window (r.), which puts luggage at best viewing height. Tall's Travel Shop, Seattle. Tucker, Shields & Terry.



Dearborn-Massa



CANOPY AT HALF-HEIGHT permits daylight to filter through top half of open front into store interior. This brings interior brightness closer to exterior brightness, preventing obscuring reflections on lower part of glass front. Canopy overhang also protects lower front from sky and other bright reflection factors, while shading window shoppers. Main glass exposure is to north, while stair tower (L.) protects from western sun. Rattan Art Gallery, Honolulu. Wimberly & Cook.

SMALL, MOVABLE DISPLAY CASES are placed along glass wall, with view-through above and around them. Entry is placed where pedestrians cut through corner lobby. Egg-crate ceiling provides over-all high-intensity interior lighting preventing too sharp brightness contrast from daylight admitted through large glass expanse. Florsheim Shoe

Store, Chicago, Ketchum, Gina & Sharp.



Photos above: R. Wenkam



CLOSED-AND-OPEN FRONT provides privacy on one side for customers selecting high-priced women's wear, provocative view-through on the other. Inexpensive wood siding is handled elegantly in facade to key-note shop's luxury appeal. Esther Foster Shop, Salem, Ore. Pietro Belluschi.



Photos above: Dearborn-Massar

Hedrich-Blessing Studio



counteract the glare; none of them is entirely successful. Kenneth Welch estimates that the threshold of destructive glare is reached when reflected brightness is more than three times the brightness of the window interior. In an average shopping street reflected brightness can easily be from 10 to 30 times what can be economically created by store window lighting. The open-front, born on city streets, is currently being moved out to suburban shopping malls without any re-thinking of the reflection problem. In many cases, reflected sky brightness will render anything inside these glass fronts totally invisible. For Welch's own anti-glare method, still very little used in building practice, see cuts.

The open front also presents a problem in lighting the store interior to which few architects pay enough attention. Daylight entering the first floor needs to be measured out and directed with the same precision as artificial light. On the outside, awnings, overhangs, soffits, etc. are available to cut down entering light. Inside the first floor, the level of illumination must be stepped up to offset the front daylighting. Sometimes the merchandising plan may suggest closing the front entirely. Where it is necessary to sell "impulse" items on the shopper's way out, a closed front may work better.

A number of recently built stores show an open front extended up to the second story. While this device may be effective for catching shopper's attention and providing extra display space, inside the second floor it presents an almost insoluble lighting problem. Says Morris Ketchum: "Upper sales floors should never have a large expanse of window, for when the customer arrives at that floor he will see most of the merchandise in silhouette, if he sees it at all."

Many suburban stores are now opening their back as well as their front with glass because access from parking lot is more frequent than from the front of the store. Most of these show that their planners have not thought through the question of what glare from the open back will do to merchandise visibility inside.



TWO-STORY OPEN FRONT in suburban store above is completely veiled by reflections. Inside second floor this much day-lighting creates obscuring glare. Macy's, White Plains.

CORNER STORE at crowded intersection (r.) makes more moderate use of second-floor window. Store stays open six nights a week, and main function of window is to draw night pedestrians' attention to bright store interior. Window is not used for display. Its daytime function is to introduce natural light into better dress department, and the owner reports that the light curtaining is successful in reducing daytime interior glare. Field's, Jackson Heights. Louis Shulman.



VEILING GLARE can completely block view if open fron reflects clear sky or sunlighted surfaces. Diagram by Kenneth Welch shows display window, with daytime illu mination of 500 foot-candles from skylight plus 300 foot candles artificial light. But range of reflected exterior. brightness is up to 20 times this intense window lighting



GLASS CAN BE SLANTED to reflect lower brightness surface (street shaded by overhang), giving display better visibility. Diagram (L.) shows how high-intensity lighting is used inside store to counteract daylight glare. Morris Bros., Miami Beach. Kenneth Welch.



EVEN THE GLASS HAS VANISHED from this open front. Don Clever's mural is background for open-air display. Peterson Tractor Co., San Francisco. Goldstine & Heiser.





## THE VANISHING SALES COUNTER

How can you double the life of your counters? How does self-service differ from self-selection? When are islands better than wall counters?

The old general storekeeper who said, "When I want to get rid of stuff quick, I just leave it lying around half-unpacked," hit upon a fundamental of modern store design. But if, as one department store executive cracked, "Please handle the goldfish" is now the slogan of modern merchandising, few have realized how far competent store architects can now carry this approach to the store interior.

Says Morris Ketchum: "We used to build a series of coffins —even displays were built in at the top of these cabinets. Remaining space was used for glazed, built-in shelves, with drawers at the bottom intended for forward stock storage. The first step away from the coffin was to disengage the display, place it in the air as plaques or boxes, usually mounted on hook strips. This meant complete freedom and flexibility in mounting displays. Finally the wall fixture itself vanished, and the wall cabinet became simply shelves attached to hook strips. Now the only elements are shelves and brackets—everything cantilevered from the wall."

"Counters were then built at an appropriate height to hold necessary forward stock. The next step was to eliminate the built-in cabinet base; whenever the clerk had to stoop down and rummage in these base drawers for stock, selling time was lost. So the base flew out and legs came in, adding to the openness of the store. As a result the island fixture acquired the light, sturdy character of the best modern furniture."

The old store counter, backed up parallel to the wall with space for clerks behind, was a space eater. Now, in many cases, island units replace these counters. They are placed at right angles to the wall, and both clerks and customers can circulate freely around them. Scaled lower than the wallhung shelves, they permit an easy view of wall-stocked merchandise. (Counters parallel to wall stock are still necessary where large stocks are required, e.g. for shirts.)

Although modern methods of air filtering and conditioning make it unnecessary, glass coverings are still generally used on store counters, adding a costly housekeeping item to the owner's cost of doing business. The Ketchum, Gina & Sharp new Wallach store in Jamaica drops a large percentage of glass from wall cases as well as from island cases. This not only makes it easier to illuminate the merchandise, but also eliminates the feeling of a barrier between customers and merchandise.

There is no clear line between self-selection and selfservice, but in general the great discovery of the supermarket has been applied in its fullest extension only to hard or packaged goods, where it is proving an extremely economic way to do business. In its new Evanston store, for example, Weiboldt installed a self-service hardware department and now reports that here eight men can do the work of twice as many in non-self-service departments.

In soft goods, self-selection is more important because, as Morris Lapidus says, "somebody has to be there to put the stock in order after each customer has 'served himself' you might as well let that person be a sales person." Selfselection simply means that the customer has a chance to see



GRACEFUL HANGING GLASS SHELVES give maximum visibility to cosmetic display intended to stop customers on their way out of high-priced women's wear store. Esther Foster Shop, Salem, Ore. Pietro Belluschi.



GLASS HAS BEEN REMOVED from all these display cases because air conditioning and filtering now makes it unnecessary to protect merchandise. Self-selection tie counter (r.) gets added visibility from glass shelves. Wallach's, Jamaica. Ketchum, Gina & Sharp.

SELF-SERVICE VARIETY STORE in New York's dense Stuyvesant district. Elimination of space for clerks behind counters means more counters can be used. Murray Store, New York City. A. Davis & Son.



Photos above: Lionel Freedman-Pictor






Alle

DISPLAY FIXTURES have shrunk to hook strips in the wall in specialty store (above) in Bogota, Colombia. See-through screen defines space without cutting visibility in Davison Atlanta store. Both, Ketchum, Gina & Sharp.

Wm. M. Branhan

SMALL FREE-STANDING COUNTER displays gloves and hose, has racks for umbrellas and belts in Peck & Peck stores. Frederick C. Peck designed fixture himself, says it has tripled sales of these accessories.

Pigget Studio

DECORATIVE VALUE of merchandise is imaginatively exploited in this small camera store in Cleveland by Architect Robert Little.



an example of every item available before his contact with the clerk and to make up his mind what he wants. It monly means fewer sales clerks but more sales; the more a cu tomer sees the more he is likely to buy.

This simple principle is of the first importance in all kind of stores. Says Kenneth Welch: "In doing a high-price shoe store, we now attempt to get one example of ever available shoe out on the floor-not just on the back wa but in the aisle space where the customer can see and eve handle it." Although most shoe merchants still shudder : the prospect, some architects think the shoe store can mov even further in the direction of the supermarket. Leste Tichy (who did the Hempstead store where Thom McA proved to its satisfaction that selling shoes in a single stor to men, women and children is not only possible but profi able) now longs to plan a fairly luxurious shoe store where customers can actually try on their own shoes an thinks proper design can make this work like a charn Tichy concedes, however, that it would be safer to stan this with men's shoes.

Counter and stock units designed to put as much merchan dise on display as possible were a logical device for th small store owner who had limited storage space. The typical small store owner gets weekly deliveries and carries no reserve stock. Paying high rent for ground floor space, h can't afford to warehouse and must gear every part of hioperation to a quick turn-over. Thus every foot of the smal store interior has to be utilized for merchandise display Says Morris Lapidus: "We can't afford the luxury of an urused wall." But this stark necessity is anything but an inv. tation to clutter. The examples on these pages show how simply and directly the mature store architects are accomplishing their objective.

With a higher percentage of gross sales being eaten awa by higher operating costs, store owners have asked thei architects for fixtures which are low in initial cost as wel as in maintenance expense. Daniel Schwartzman recommend use of new materials lending themselves to production meth ods not dependent on the fast-disappearing cabinet maker He has designed completely flexible fixtures of pierced shee metal and standard hardware components in a recent project for Macy's.

\* Low-cost shoe self-service is used in Wanamaker's big basemen shoe department in New York City.

# THE FLEXIBLE PLAN

What do women's hat sales do to layout? Why is reserve stock disappearing? What is traffic?

The biggest reason why stores are no longer warehouses chopped up into gridiron aisles is also the oldest fact in store operation. Despite the many elaborate devices now available for making the customer love you as much in May as he did in December, the customer, determined soul, still buys about two-and-half times as much in December as he does in the slowest month of the year, usually July. Where fixed counters have been used in the old gridiron plan, a summer day may discover a typical men's furnishing store with some 80 ft. of counter space surrounding a single despondent clerk.

Within the overall yearly fluctuation in the store's busi-



MULTI-LEVEL DISPLAY CASE gets three times as much merchandise on view as old island cases. Shelves are easily adjustable for height changes according to merchandise. Fixtures like these make self-selection possible in housewares departments. Daniel Schwartzman design.

LOW-COST DEVICES are ingeniously used to get a variety of merchandise on view in this small gift shop, housed on ground floor of remodeled brownstone. Idella LaVista Shop, New York. Norman Cherner.





ness, there is sharp season-to-season and month-to-month fluctuation in specific merchandise items. A typical men's store will do 40 per cent of total December business in scarves, only 10 per cent in hats. Women's millinery may amount to only 6 per cent of a store's sales in summer, increase tremendously in spring. Eddying briskly through these seasonal tides are the highly unpredictable currents of fashion. A large chunk of sales space may suddenly be demanded simply because women have taken to wearin; boy's shirts—a notion that may or may not vanish as abruptly as it appeared.

Nowadays these basic fluctuations in the merchandising operation are met by the most adroit modulation of floor plan, sales counter, lighting, ceiling and partitioning. Lightweight, easily movable tables, racks and counters mean that the floor plan itself may fluctuate with the shifts in sales. Multi-purpose sales fixtures are by now such an old story that most architects are currently concentrating less on infinite adaptability of fixture and more on a simplified design which can be adapted for a few changes in shelf or rack height by stock handlers who do not happen to be mechanical engineers. Above the shifting floor plan and fixture, a drybuilt, flexible ceiling now provides for equally rapid changes in lighting or partitioning. (See page 71).

With complete flexibility as the desired goal, the skilled architect now manipulates the basic elements of impulse, convenience and demand goods and of display, circulation.



CURVED DISPLAY RACKS draw customer to rear of store, conceal ample fitting rooms. "Impulse" goods are concentrated on the left, on shopper's way out. New plan made self-selection so easy that sales force was cut in half. Daly's, Trenton. Victor Bohm.



stock and service space with considerable agility. In general, such old rules as that "demand" items like shirts and underwear will be farther down the line than "convenience" belts, garters, etc. and that "impulse" ties shall be right next to the door still hold. But the architects also know that it is equally important for the purchaser of a new suit to get a glimpse of, say, the hat display and they have a number of ways of relating merchandise for such suggestive selling.

Another new factor influencing the floor layout is the trend to do away with "reserve stock." Stores now try to place as much reserve stock as possible right next to the space in which it is sold, either by peripheral storage space on the sales floor or by introducing small stock mezzanines. This means that the stock no longer can be classified as "reserve" since proper design of the storage unit makes all the stock immediately accessible at the point of sale. With all store owners now keeping a careful eye on indirect costs, peripheral stock storage has the additional advantage of making it possible, in dull hours, to use the sales force for remarking, storekeeping, etc. It also fits in with the trend to more frequent inventories, inspired by department stores' current fascination with cost control, and stock storage is now being designed for systematized inventory taking.

Some merchants still find it hard to cut into sales space with forward stock storage. But compact planning can accomplish this with very little sacrifice. In Kenneth Welch's remodeling of the Broadstreet store in New York, for example, forward stock capacity was increased 40 per cent with a sacrifice of only 5 per cent of counter selling space, resulting in a far more productive balance. Lavish use of glass, openness under counters, etc., made this small sacrifice unnoticeable.

In addition to the necessity for working out all these complex inter-relations of the floor plan, the store architect sets himself a further objective. Among building types, stores are uniquely designed for moving traffic. The art of store lighting and display is often likened to the design of a stage-set, but actually it is a much more demanding business. The shopper's viewpoint, unlike that of a theater audience, is not fixed-he must be given a dramatic view from any point in his path along the "indoor shopping street." Kenneth Welch sums up the importance of this aspect of planning: "Traffic-so necessary to retail success-is nothing but viewpoint in motion."



FLEXIBLE COUNTER CASES by same manufacturer also have variety of basic parts easily interchanged by unskilled personnel.

POST







FLEXIBLE FIXTURES installed in corset department will provide for Christmas expansion of adjoining department. Counters will be moved to another department, shelves removed from wall fixtures and replaced by racks for hanging negligees. Macy's New York.

STORE-WITHIN-A-STORE is adroitly created within tight space confines of mens wear store by a slightly raised level, carpeting, change in lighting. Note how racks are curved to surround customer with easy-to-see merchandlise. Manhattan Store, Cumberland, Md. Morris Lapidus.

# THE FLEXIBLE CEILING

When can you afford it? How can it improve lighting?

"Yesterday's store ceiling supported a rich growth of elaborate lighting fixtures, ornamented electric fans, highly decorated brackets carrying wires on which packages whisked back and forth, exposed sprinkler pipes, assorted bells and clocks. Today the childish enjoyment of these mechanical gadgets has subsided. We are incorporating all mechanical functions as integral parts of the store building instead of attaching them later." —VICTOR GRUEN

The store owner, bent on rapid changes in store layout, had bumped hard against the rigid, plaster ceiling with lighting frozen therein. Now a dry-built, flexible ceiling makes it possible for him to change the floor plan overnight. This dry-built ceiling has brought a complete change in lighting technique. With a plaster ceiling, light was usually installed in an over-all pattern. Obviously this illuminated everything to the same degree: both sales fixtures and floors were being lighted almost as brightly as the merchandise itself. With flexible lighting, no light need be wasted on floors and furniture. The sales counters can be placed where needed and lights concentrated above them.

Flexible ceilings are of two main types: 1) the over-all louver or "egg-crate" ceiling, with lighting, air conditioning diffusers, sprinklers hung above the louver; and 2) the dry panel ceiling, with opaque panels (corrugated cement asbestos, acoustic tile, plywood, building board, metal pans, etc., are all used) alternating either with lighting panels or with incandescent lighting fixtures built into certain panels as required by the sales layout. Unlike the plaster ceiling, both provide instant access to all mechanical lines suspended from the floor slab. Both have acoustic value. Design simplifications have recently reduced the initial cost of these dry ceilings and made it easier to sell store owners on the long-range saving they promise over the cost of cutting into a rigid plaster ceiling.

The first steps to make the flexible ceiling practical for a large store area were undertaken by Ernest Born and Gruen & Krummeck in their collaborative design studies for Macy's San Francisco store. This panel system is illustrated in Victor Gruen's sketches (r.). It is now standard Macy practice to alternate dry panels with 4 x 4 ft. lighting squares.

Ketchum, Gina & Sharp, in collaboration with Stanley McCandless, have recently worked out a flexible ceiling which makes it possible to direct light precisely where needed. In this system, panels equipped with light are spotted above the sales fixtures. Panels above aisles do not have built-in lighting equipment. This ceiling will be installed in a department store not yet under construction, but quotations already received show that its cost will compare favorably with any other type of dry-built installation.

The well-known New York Florsheim women's shoe store (Ketchum, Gina & Sharp) was one of the first to use an overall louver ceiling. Here both incandescent and fluorescent sources are hung above the ceiling, flooding the entire sales area and the outdoor lobby with intense but glareless light.

Two recent big department store installations have yielded impressive evidence that the overall louver or flexible module ceiling can be had at a competitive cost. This ceiling was used throughout the Herpolsheimer store in Grand Rapids and the Jordan Marsh store, Boston. It was designed by Richard Ely, Allied Stores architect (both stores are Allied



MECHANICAL SERVICES run above metal grid suspended from floor slab. Ceiling panels are clipped to this grid.



MANY LIGHTING PATTERNS and quick changes are possible. Here louvered fixtures alternate with flood-lights.

MULTIPLE OUTLETS, ceiling mounted, provide flexible wiring, making it easy to move light fixtures.

Photos (below): Joseph W. Molitor









REMOVABLE PANELS give instant access to services and lights, permitting flexible space below.



NARROW fluorescent lamps could be inserted in flexible ceiling pattern for directional lighting.



affiliates) in cooperation with engineers of the lighting manufacturer. The ceiling was a 32 in. aluminum module, with 3 in. cells. It cost an estimated average of \$2.50 a sq. ft. installed and including lighting. (Plaster ceiling costs from 66 cents to \$1 per sq. ft., not counting lighting). The modular ceiling saved money in these ways:

1. Industrial fluorescent lighting fixtures and industrial type sprinkler heads were used, because they were invisible above the 45° louver cut-off.

2. Usual air diffusers were not needed; ducts terminated in hat-type outlets above the hung ceiling, with louvers acting as diffusers. (This saved about \$75 for every diffuser eliminated.)

3. Telephone wiring was suspended from the floor slab, eliminating expensive conduits. (In Jordan-Marsh, where there are 3,000 phones, this saving alone is estimated at several hundred thousand dollars.)

4. In Herpolsheimer's, building code approval was secured for simplified steel channels embedded in the concrete slabs of upper floors. Ducts, lighting fixtures, louvers, wiring, etc. are all hung from these.

One big objection to this kind of ceiling-the fact that glass counters reflect the light sources above the louversis being met in the Jordan-Marsh store by re-design of all counters to eliminate glass. Our collaborating architects also criticize this extensive use of the louver ceiling on grounds of monotony, and as failing to high light merchandise. Its sponsors argue that it can be considerably varied by replacing louvers with plastic or opaque sections, by stepping up lighting intensity or varying light sources.



FLUORESCENT LAMPS hang from channels embedded in concrete floor slab.

TROLLEY DUCTS run across on 16 ft. centers. Each fixture plugs in separately.



LOUVERS are engaged by star-shaped leveling device and hung from 48 in. rods.

LOUVER SQUARES are snipped to fit around column. Installation proved easy.



Sylvania Electri



VIEW above louver sections shows fluorescent lamps mounted in 16 ft. portable fixtures and hat-type conditioned-air outlets. Louver sections can be lifted up and slid to one side for instant access to lighting fixtures or other service lines screened by ceiling.



FLUORESCENT LAMPS above ceiling deliver 75 foot-candles to the sales space below. Shadowing could have been reduced by setting lamps at 45 ft. angle to louvers. All pictures: Herpolsheimer's.

FOUR MECHANICAL SHAFTS concentrate plumbing and other service lines and provide decentralized transformer stations at each floor. This kind of planning increased direct sales space to 75 per cent.



Sylvania Electric

# AIR CONDITIONING

Why zoned cooling? Have.you considered the ceiling plenum? How can duct space be cut in half?

Without air conditioning, the modern store interior would never have been built. Modern lighting would be impossible —without an air conditioning system to offset the heat load. The open front would be impossible—yesterday's designer had to use a large part of the front for ventilation. Air conditioning has taken the store windows out above the first floor (at great saving in merchandise damage by dust and fading) and the glass off the display cases (making "tactile" selling and self-selection possible and saving the housekeeping expense of these large glass areas). Air conditioning has made it possible to replace the 8 ft. high partition, once necessary for air circulation, with full-length, lightweight wall sections hung from the grid of the flexible ceiling. Emergency control of air supply has been used to help make large stores fire safe.

If merchants were originally forced to air-condition to compete with the store next door, they have had the happy reward of discovering that air conditioning literally pays for itself—in relieving the usual summer slump, in greater personnel efficiency, in eliminating markdowns on sweatdamaged goods, in reduced cleaning bills.

Architects, on their part, must now consider the air conditioning system as integral a part of the building as the wall itself. This means taking advantage of the immense freedom which this technical advance yields in designing every element of the store. It also means considering such devices as the ceiling plenum (the flexible ceiling illustrated on p. 72 is an example) for reducing the cost of the air conditioning installation itself. Where diffusers or grilles are used, these must now be planned as a visual element of walls or ceiling. The demand for the flexible store interior means that ducts and grilles must be located to provide for future changes in partitioning or floor plan.

### **Packaged** units

Smaller one- or two-floor stores usually use the self-contained or packaged air conditioning unit, requiring no duct work. Most of these employ Freon as a refrigerant and range in capacity from 3 to 20 tons. Over recent years, all manufacturers have designed these units into compact, noiseless units occupying little space in the store plan.

Recent improvements in these self-contained units include a packaged heating and cooling unit (just now coming on the market) which operates with steam. In cities where a cheap steam supply is available, this unit may cut operating costs substantially. Several manufacturers now make compact packaged summer-cooling and winter-heating units, controlled by the same thermostat in winter and summer.

## Zoned cooling

In larger stores, especially in the multi-story department store, it is necessary to plan for air conditioning control by zones. Cooling load varies in different parts of the building as the sun moves; it also varies as shopper traffic moves from, say, the sale in ladies' ready-to-wear in the morning to the tearoom at noon to the beauty shop afterward. Temperature and humidity requirements may also vary considerably according to the type of merchandise sold—food requires more cooling than dry goods. One manufacturer has developed compact "multiple zone" conditioning units to meet this need. These units are designed to handle up to six zones, with individual controls and dampers for each zone. This makes it possible for the same unit to heat in one zone while cooling in another—or to supply a properly balanced mixture of heated and cooled air to provide instant response during in-between-season periods.

More awareness of the zoning problem is reflected in another manufacturer's report of increased use of a multiple number of its self-contained conditioners. These are spotted at various locations throughout the store area, placed against or behind walls and used with or without duct work.

### Out of the basement

Where centralized units are called for, stores are getting interested in the new absorption machines. These steamoperated units are recommended by their manufacturer as light and vibrationless and therefore suitable for roof-top installation. Since basement area in large department stores is highly productive sales space and subbasement space is now often pre-empted for off-street delivery, getting this mechanical equipment out of the basement is important. The Kraus Department Store in New Orleans (where there are no basements) has just ordered three of these units.

Large stores which have not yet faced the problem of adding an air conditioning system to an existing building will be interested in the high-velocity installation now being made by Kaufmann's department store in Pittsburgh. Located in a roof penthouse, this equipment will cool 12 floors. Highvelocity systems, now being perfected by several manufacturers, recommend themselves to large scale remodelers who can't find space for ducts. These systems make it possible to use smaller supply ducts, cutting required installation space and making it possible to avoid relocation of lights and sprinkler heads.

## **Dust** control

Practically all large stores now equip their air conditioning system with electrostatic filters, which remove air-borne particles of dust, lint, etc. Merchants have found that, like the air conditioning system itself, these filters pay for themselves in reducing damage to merchandise and cutting the cost of redecorating. Our architect collaborators point out that the trend to self-selection means that even smaller stores should now consider such air-cleansing devices a necessary outlay. Kenneth Welch recommends going so far as to install an electrostatic filter in a doorway floor grille—to draw the dust out of the customers before they finger the merchandise (or at least out of their shoes.)

Water shortage in some areas and the increasing drain upon municipal resources almost everywhere now means that planning for air conditioning must also be planning for water conservation. New York requires a cooling tower or evaporative condenser for any unit over three tons, and many other cities have followed suit.

# LIGHTING

# When can a store be too bright? Why won't direct light work for silverware? Why is "combination" lighting necessary?

Since John Wanamaker installed the first electric light bulb in Philadelphia, store owners have always been among the first to pay up for improved lighting. The obvious reason for their alacrity is that shoppers won't buy what they can't see, and that there is no effective way to draw the shopper's eye to the merchandise except by making it the brightest object within view. Adequate brightness on all stock is imperative for today's trend toward self-selection.

The store interior probably presents a more demanding lighting problem than any other building type. Says Morris Ketchum: "Store lighting must combine the comfortable visibility vital to residential lighting with the high intensity illumination used on work surfaces in an office or factory. Both elements must be blended harmoniously into an overa'l effect without harsh glare or hard contrasts."

The tremendous development in both light sources and lighting equipment over the last decade has given the store planner a tool of remarkable flexibility. Today he can combine the warm, directional incandescent lamp with the cooler, diffused fluorescent to produce an artificial lighting environment which—in the case of the store interior at least—is more efficient than natural lighting. Moreover economic flexible wiring installations combine with the flexible ceiling (see p. 71) to make future lighting changes possible at little expense. This means that the lighting pattern in the ceiling above can follow changes in display and in space use on the floor below with remarkable precision.

Over the last decade the architect has also learned how to exploit fully the possibilities of modern lighting by considering it from the beginning as an integral part of his building plan. He has learned how to use light as a fluid tool for molding and dramatizing architectural surfaces and he has also learned that the surfaces themselves must be handled as a part of the lighting job—that is, that their color and texture must function as calculated reflection and brightness factors.

Although the new lighting provides marvelous precision of effect, expert store planners have had, in many cases, a hard job selling its possibilities to store owners. This is because too many store owners still see lighting only as a means of "making my store brighter than the other fellow's." In the first flurry of experimentation with new lighting, brightly lit stores did prove extremely effective in drawing customers into the store. But this competitive advantage was usually lost on the inside because the lighting competed with the merchandise for the customer's attention. Today the expert store architect knows that the last thing he wants to do is to make the store interior as bright as he easily can. The store owner could much better sum up his lighting aims by saying—"Make my merchandise brighter than the other fellow's."

Modern store lighting aims to make the merchandise itself at least three times as bright as any surrounding surface. This is now most generally accomplished by direct illumination from shielded or recessed sources, supplemented by some indirect or diffused lighting. In most small goods areas, the redesigned and glassless counter (see p.



INTENSE LIGHTING back of louvered ceiling is used to draw customers to hat bar at rear of store. Hollidge, LtJ. Boston.



Herndon Associate.

RECESSED incandescent downlights and fluorescent cove uplighting used in Altman's, Manhasset. Edmund Kelly, lighting consultant.







ECONOMIC SOLUTION for general lighting, eight fluorescent lamps can be used separately from two incandescents in some  $3 \times 3$  ft. fixtures, Gimbel Bros., Pittsburgh. William York Cocken.

OVERALL LUMINOUS INTERIOR providing general level of 50 foot-candles is here achieved by painting two walls and ceilings white for high reflection factor. Louvered ceiling sections  $(4 \times 4 \text{ ft.})$  shield fluorescent down lights, supplemented by recessed incandescent spots. Valance at top of wall cases and racks conceals fluorescent tube, which throws light down on merchandise and up on ceiling. Meeting of two lights on white walls gives haze of diffused brilliance. Wallach's, Jamaica. Ketchum, Gina & Sharp.



Photos (top) Lionel Freedman-Pictor



LOW-COST REMODELING JOB will employ these suspended fixtures which use large areas of fluorescent lamps. An incandescent element in distributing reflector is inserted every 8 ft. Fixture is also equipped with recessed duplex receptacle every 8 ft. to accommodate adjustable spotlight where needed. Max Grove, illuminating engineer.



CENTER OF CHANDELIER (William Pahlmann design) conceals eight floodlights. Both, Bonwit Teller, Chicago. Bernard F. Greene, lighting consultant.

INCANDESCENT SPOTS mounted over cases project light to center of ceiling, while fluorescent strips eliminate scallop shadowing. Average: 35 foot-candles.





FITTING ROOM LIGHTING presents a psychological dilemma. If light is bright enough to show off dress, it won't flatter customers. Planners meet this by keeping direct light off customer's face. This detail shows both incandescent and fluorescent light directed through louver to mirror at an angle to hit garment. Kenneth Welch design. For same reason, Bonwit-Teller, Chicago, installed twin bull's eye spots in each fitting room directed on garment at waist height.

LIGHT FIXTURES slide along trolley duct, meet art store's need for flexible lighting at low cost of \$1.50 per sq. fl. Note wood strip wall finish, designed to hang, not only pictures, but also desks, shelves. Raymond & Raymond Gallery, San Francisco. Francis J. McCarthy, architect.

LUMINOUS SHELVES light crystal display with uniform wash. Fluorescent lamps, 40-watt, are used under frosted glass. Dayton Co., Minneapolis. Robert Hansen, Larry Haugan, architects.

INTEGRAL WITH CEILING, fluorescent sources give general illumination in this jewelry store plan. Incandescent spotlights are directed precisely where needed. Serge Chermayeff, architect.







67) now makes it possible to dispense with counter lightin and to put the direct light source in the ceiling. This mean that when a customer lifts a tie out of a display case fo closer examination in the "appraisal zone" above or around the counter it will be just as brightly illuminated as it wa in the display case.

Where merchandise lighting is installed in the ceiling overspill from this direct source can be counted on to illum inate aisle space. This direct downlighting is usually sup plemented by perimeter lighting to illuminate wall surface and by some indirect or uplighting to illuminate lightles portions of the ceiling.

Even with improved light sources, making the merchan dise "three times as bright as anything else" is not so simpl as it sounds. Brightness, as we all know by this time, is no simply the amount of light used (foot-candles), but amoun of light times the reflection factor of the illuminated of ject. Store merchandise ranges from a reflection factor o 1 per cent (a blue serge suit) to a reflection factor of 8 per cent or better (silverware, other mirror-like surfaces) While the primarily direct lighting method described abov will be efficient for most small goods counters (largely sof goods of diffuse texture), it will not be equally efficient i stores where silverware, housewares or other high-reflectio factor items are sold. Here indirect or other methods achiev ing a more diffused surrounding brightness are needed.

Kenneth Welch says that a sound lighting plan mus also appraise the lighting method employed against the sale importance of the merchandise being lighted. Thus the merchant should be encouraged to spend the greatest amoun of money on lighting "impulse" counters, while cutting the budget may be prudent in lighting "convenience" counters

The expert store planner prefers a combination of in candescent and fluorescent lighting to the use of either ligh source alone, and this preference is reflected in the number of products now on the market which combine both sources in a single fixture. Lower-wattage fluorescent means reduced air conditioning and operating costs, but incandescent must usually be added to give merchandise highlight and sparkle

Color correction is no longer the main reason for combination lighting. Manufacturers have recently developed a phosphor which enables the diffused fluorescent to bring out a proper amount of red, and store owners are enthusiastic about this improved "warm" fluorescent. Our store architect collaborators agree that a combination of incandescent and fluorescent is necessary for other reasons. The directional incandescent creates high light and shadows to bring out form and texture; the diffused fluorescent illuminates detail in the shadows and prevents too great a brightness contrast between merchandise and surrounding area. (An interesting regional variation is in the deep South where a high proportion of daylight fluorescents are used in stores because their coolness is preferred to any amount of dramatic merchandise lighting.)

While the first rule of modern store lighting is "Don't hit the shopper in the eye with the lighting fixture," many store owners think they can save money by installing direct lighting fixtures suspended from the ceiling. This means that the fixture is the brightest object within view, and the customer's eye is drawn to it instead of to the merchandise. Says Morris Ketchum: "In such a lighting plan, glare and monotony tend to more than counterbalance low initial cost." Most of the examples here show, by contrast, such skillful integration of lighting with ceiling and other surfaces that the whole interior has become the lighting "fixture."

# MACHINES TAKE OVER

# What's new in warehouse methods? How can marking costs be cut?

Anyone who believes that big department stores are on the way out as a merchandising method has yet to reckon with such managers as Fred A. Lazarus, head of Federated Department Stores (an alliance which includes Filene's in Boston, Foley's in Houston, Bloomingdale's in New York and other blue-chip properties). Says Lazarus: "The department store has every advantage as a distributive institution, because it sells 275,000 items in the most economical place to shop from the standpoint of the customer's time." Since the war, Lazarus has devoted himself to the question which will determine whether the massive, centralized department store goes or stays: the high cost of doing business. Much of this cost is chargeable, not just to the size of the store itself, but to the city congestion which surrounds it. The fact that the downtown store spends 2 per cent of sales on delivery is, for example, directly chargeable to the fact that the downtown shopper cannot bring her car along.

Lazarus tackled the cost of doing business by recognizing that department stores had reached a size big enough to make industrial methods-both of work simplification and of materials handling-pay off. Lazarus' studies ranged from how many times the clerical force handled a sales slip to how many times the warehouse force handled a sofa. Proper planning, he found, could reduce handling in both cases and result in impressive savings. The warehouse planned for Lazarus by the Austin Co. is probably the most spectacular of these.\* Built on cheap outlying land at a distance from the Lazarus store in Columbus, the warehouse made use of all kinds of mechanical conveyors and especially of palletization of merchandise for handling by fork-lift trucks. Since then, many big department stores have built mechanized warehouses. Just last month Carson, Pirie, Scott in Chicago opened its one-story warehouse, covering 111/2 acres, and figured it can handle 50 per cent more goods than in the old one at no increase in floor space. Fork-lift truck handling has proved so efficient in warehouse operations that many manufacturers are now pre-palletizing merchandise so that it can be shipped ready to be picked up at delivery point by the fork-lift truck.

As one of the few big department stores to be built from the ground up since the war, Foley's in Houston took advantage of its opportunity to introduce considerable mechanization in the store itself. This included: 1) spiral chutes cutting through five floors down which packages were dropped to a conveyor belt leading to a basement ring where they were sorted for delivery trucks or customer pick-up at the parking garage; 2) a conveyor belt for moving merchandise from unloading dock in the adjoining garage to the receiving and marking room; 3) peripheral stock space on each floor fed from a service core of freight elevators, dumbwaiter and automatic wheeler lifts.

Thalhimer's in Richmond has introduced one of the most elaborate mechanical systems for moving goods from delivery through marking operations. This system is based on the simple principle that it is cheaper to move the merchandise to the markers rather than to have markers moving back and forth in pursuit of small lots of merchandise. Both the Foley and Thalhimer installations were designed by consulting engineer Edward Ashley.

In addition to these large scale installations, merchandisers now have at their disposal an ever-growing variety of devices which range from the U-Ask-It—a mike into which a customer seeking housewares can speak and get directions —to a Window Shopper which records the looker's buying impulses on plastic tape if he will merely speak them.

# PATH OF THE COMMUTER

# What about vending machines? What do lunch-hour shoppers want?

As the record rate of postwar housebuilding pushed the retailer's prime customer—the middle-income-family with children—farther and farther out in the suburbs, Main Street merchants began to revise their methods to accommodate the suburban customer when he came to town. Unfortunately, not all these suburbanites came at the same time and for the same reason. On the one hand, there was the large group of commuting business men and other office workers. To pull these travelers into Main Street stores on their lunch-hours or on their way to the suburban train meant special merchandise promotions: women office workers spend more for their "white collors" than do factory workers and quite a bit more than the average "homemaker."

The commuter forced stores to adopt selling methods geared to quick, efficient service and to seek locations near or in railroad or subway terminals. Filene's vending machine installation in the Greyhound Bus Terminal (which



practically every prominent retailer in the country has ogled over recent months) is only the first sign of how far the downtown merchant may eventually be obliged to go in getting on the path of the commuter. Over recent months several large department stores have taken official cognizance of the fact that the downtown customer is increasingly a lunch hour customer. These stores have taken the simple step of scheduling employees' lunch hours before 11 and after 2 so that the peak sales force will be on hand during the hours of peak shopping traffic. Evening shopping hours were, of course, a much earlier recognition that the downtown customer is no longer just a middle-class housewife with lots of shopping time on her hands.

But quick, efficient—even vending machine—service will not entirely meet the needs of another important group of downtown shoppers. These are suburban housewives on regular shopping excursions in pursuit of fashion apparel of such "lifetime" purchases as furniture or major household appliances. Downtown merchants count heavily on having this customer around for a long time (but special

<sup>\*</sup> This warehouse will be reported in detail in a fall issue of the FORUM.

PARKING LOT access to this small store is planned with as much care as the store front. Parking space is screened by landscaping, and entry to lot is exploited by free-standing display case, which also helps to shield less attractive part of parking lot from street view.

Victor Gruen says: "The small shop is the architect's greatest challenge. Expensive materials and construction must be replaced by ideas and imagination." He shows how to do it with this Los Angeles job. The whole building cost only \$22,000, including parking lot treatment. Stucco, wood, fir plywood, other economic finishes helped cut costs. All show windows were set in wood with the help of small galvanized iron channels. Exposed roof is whitewashed to exploit indirect lighting for high overall illumination.

ADEQUATE OFF-STREET PARKING and unloading is now so important to retail success that the W. & J. Sloane furniture store spent thousands to provide it in their new branch located on expensive Wilshire Boulevard frontage, Beverly Hills. Some 90 per cent of shoppers are expected to enter store through rear motor promenade, which is lined with show windows. Attendants take cars down ramp to basement garage accommodating 150 or to open-air parking which can be extended backward to take an unlimited number. A subbasement level holds three unloading docks and storage space. Trucks use same ramp as cars, but bear left into subbasement. View below shows motor entrance. Paul Williams, architect.













ashion promotions at suburban branch department stores ave already showed that the suburbanite, in increasing umbers, is ready to settle for a fur coat or couturier model vithout bothering to come downtown.) The merchants argue hat "high fashion" shopping and furniture shopping is omparative shopping-that is, a woman may buy a sports ress or some novelty curtains in a branch store, but when he makes a sizable investment in either clothes or home urnishings she still wants to see all there is to see. In New York, where downtown store congestion and downtown store investment are both at their highest point, merchants point out that the mass transit lines which serve this vast urban complex offer the suburban housewife at non-rushhours a fast and easy way to reach the downtown store. Some of these men feel that the store must keep her interest in these excursions by spending money, not only to make it easier for her to get to the merchandise, but also to make it more fun. This philosophy is back of the current move among the department stores to create fairly luxurious restaurants in the place of yesterday's skimpy tearoom, to build in auditoriums (which can be converted to toy selling space at Christmas), for women's club meetings or simply to provide more pleasant places where the shopper can rest her feet.

The need to satisfy the requirements of a great variety of downtown customers—the everyday commuter, the once-inawhile suburban housewife, the city dweller in all income groups—simply points to an old fundamental in store planning. This is that a crystallization of merchandising aims must precede even the smallest step toward a building plan. Now as never before the downtown merchant must know who his customers are, what their buying power is, what merchandise and what services will best meet their needs.

Daniel Schwartzman emphasizes that setting up building or remodeling requirements for even the smallest store means a comprehensive research program including "1) a study of the needs and habits and buying potential of the public in the marketing area; 2) the ratio of the expected dollar volume of yearly business and the sales area to be occupied by the various types of merchandise within the store; 3) the business background and aptitudes of the operating merchants."

In estimating hoped-for dollars of sales per sq. ft., the architect will, of course, start with such basic data as the figures published annually by the Controller's Congress of the National Retail Dry Goods Association. These reports give typical sales per sq. ft. for stores in various volume and regional groups. But Schwartzman emphasizes that these basic figures are only the beginning of the merchandising analysis. Average sales-per-sq.-ft. ratios must be carefully adjusted to the merchandising aims of the store under consideration. Ratios must be readjusted by the architect on the basis of whatever space economies he may be able to make. Thus if the architect can compress, say, the shirt counter to half the usual space by a careful forward stocking scheme, productivity per sq. ft. will be correspondingly raised.

Says Victor Gruen: "When merchandising needs have been analyzed and merchandising aims clearly stated, then and only then can the design of the structure or the design of alterations to a structure proceed. Never shall the structure or the building be permitted to make merchandising its slave, pressing it into spaces and shapes not suited for it. From the amount of needed sales fixtures, stock space and services, which have been established as a result of careful planning surveys, definite conclusions can be drawn concerning size, height and character of the structure."





DISTINCTIVE IDENTITY is here given to three shops—bakery, cosmetics, jewelry shop—by expertly varied entries and display within a unified building facade. Owner needed a mezzanine stock room but his sales space needed not to be over 9 ft. high. Architect Douglas Honnold reconciled both conditions by a steeply sloping roof that saved \$6,000 compared to a conventional flat roof. John M. Gibbons Store Building, Beverly Hills.









# CHRIST CHURCH

This church is the last completed work of ELIEL SAARINEN, Architect and Planner He died June 30 at the age of 76, full of honors and ripe in years

Art, science and faith achieve a serene harmony in this simple church. At a time when burgeoning scientific discovery is sometimes the master rather than the servant of architecture, the Saarinens have demonstrated here that science and art may be perfectly, yet inexpensively wedded. The faith that built the church was spread by its young pastor, who believed deeply that a modern structure would serve Christianity better than a Gothic or Colonial copy, and who found a way to convince his congregation that he was right.

In purity of spirit and simplicity of form this church recalls the early Christian era; yet it has a contemporary core. Its spirit and form retain their impact because the architects have handled the technical elements with such subtlety that only an expert would guess how scientific the treatment actually is. Acoustics dictated the shape of the nave, the pitch of ceilings and walls, the form of decorative surfaces. Contemporary lighting methods are used to create the climax of the whole interior—the Baroque radiance of the sanctuary—and to provide an adequate level of general illumination. Radiant heating and an efficient ventilating system are integral parts of the building. The skilful absorption of these "environmental controls" into the design is described and illustrated in more detail on following pages.

The church not only assimilates the achievements of modern science with no loss of spiritual quality; it also satisfies tight budget and site requirements. With only about \$300,000 available for building, the congregation wanted permanent seating for some 600, overflow space for 150 more, a small chapel, a choir of 50 voices, a baptistry and a modest number of service rooms. The site was a narrow corner plot adjacent to a building of faintly Gothic character which was to continue in use as a parish house. Costs were held down mainly by using simple materials and a direct plan that met the basic needs through some overlapping use of space. The large unbroken brick areas which give the church dignity were also helpful in effecting savings. The face of the old building was simplified and tied into the taller mass of the new structure by a graceful arcade. Characteristically, the Saarinens' solution to these practical requirements involved no sacrifice in design quality or painstaking attention to detail.

For others who want to make a similar step toward a new church architecture, the part played by the young pastor of this church is significant. Returning to Minneapolis after wartime service as a chaplain, he faced the problem of persuading his congregation to abandon a



LOCATION: Minneapolis, Minn. SAARINEN, SAARINEN & ASSOCIATES, Architects HILLS, GILBERTSON & HAYES, Associate Architects KRAUS-ANDERSON, INC., General Contractor **BOLT, BERANEK & NEWMAN, Acoustics** 

Photos: George Miles Ryan Studios





Typical of the fine details which enrich the building's simple masses are the arcade between new and old structures (above) and the handsome main doors (right).



previously accepted Gothic plan in favor of the Saarinen design. The most powerful factor in his successful can paign was a course for the congregation in the history o church architecture.

The reaction of the congregation to their new church i perhaps best summed up in the words of an outsider wh said, "I am not a Christian; but if I have ever felt lik getting down on my knees, it has been here."

The plan sets up a balance of the practical and the estheti which carries through the entire structure. By using a mini mum of four interior columns and by carrying the pew into the side-aisle space, the architects were able to establish the fine proportions of the nave somewhat independently o the seating arrangement, and without reducing capacity. The layout of narthex and chapel at the rear of the church provides a comfortable overflow space for such occasion as Easter and Christmas. A rear balcony for choir and organ was dictated by site limitations, but it has the happy effec of leaving the chancel free of all distracting elements. Stor age, utilities, coatroom and toilet facilities are concentrated in a full basement. The sacristy wing ties in with the exist ing building, forming a pleasant court before the glass wal of the minister's study.

Natural lighting is used with dramatic simplicity to make the main altar and the brushed aluminum cross above it focal points of the whole interior. With a ceiling-high louvered pine screen concealing its source, light streams into the sanctuary through a window extending the ful height of the south wall. Like the cyclorama of a moderr theater, the curved white brick wall of the sanctuary cups the light, suggesting infinite space. The altar of the chapel





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Adequately lighted on most daytime occasions by chancel and sideaisle windows, the church also has a flexible artificial lighting system. The distinctive spun-aluminum "spoon lights" projecting from the southern clerestory wall may be used for strong indirect lighting, while smaller recessed ceiling fixtures provide general illumination.



metal deck-12 purlin metal hangers-2-0 o.c. 1/2 Cs-4-0 o.c. suspended anchor bar rom purlins and metal clip deck 4 2-0\*\*2-0" cement asbestos panels anchor bars

# COST BREAKDOWN

COST BREAKBOWN	
Temp. facilities, bldg. permits, scaffolding & miscella-	
neous	\$5,000
Excavate & backfill	4,000
Structural concrete	25,000
Masonry	70,000
Basement floor & walks	3,000
Concrete finish (1st floor)	500
Waterproofing & drain tile	500
Miscellaneous carpentry	3,082
Structural steel	15,000
Steel deck	- 3,500
Misc. & ornamental iron	22,000
Reinforcing steel	11,000
Roofing & sheet metal	9,000
Lath & plaster	5,500
Marble & tile	9,000
Millwork	11,000
Hardware	1,600
Toilet partitions	600
Weatherstripping & calking	300
Glass & glazing	1,100
Plumbing, heating & ventilating	50,000
Electric wiring	9,000
Cement asbestos ceiling	4.000
Supervision	5,000
Suber Alsion	
Total	\$268,682

Total .....

is lighted in a similar manner, without any attempt to conceal the light source. Surprisingly, the windowless upper portion of the nave is not dark and gloomy, but filled with a soft, reflected glow from the chancel.

Wall sections between the side-aisle windows are spaced closely and slightly canted on their inner surfaces to keep direct light out of the eyes of the congregation and to direct attention to the brilliantly lighted altar. Unlike some louver systems which shield the audience but leave the speaker facing the light, the depth and spacing of the wall sections give a measure of glare protection to the pastor as well as to his congregation.

Acoustics were considered early in the planning, and the building was shaped to control sound with a minimum of absorptive material. To prevent the "flutter" produced by sound bouncing between parallel surfaces, the northern clerestory wall is slightly splayed and ceilings are canted. Suspended from the steel roof grid by metal hangers, the main ceiling is surfaced with perforated acoustic tile, backed with 2 in. insulation over 38 per cent of the total area (detail at left). Behind the visually effective waves of openjointed brickwork on the northern clerestory wall soundabsorbing material furnishes additional protection against reverberation. Similar material is introduced in ceiling strips along the outside of the aisles, behind the wood screen in the sanctuary and on the soffit of the choir balcony. As a perfectionist touch, the rail of the balcony is tilted forward to prevent echo from its surface.

To improve tone transmission, a decorative open-weave plastic fabric covers the face of the organ loft, forming the rear wall of the balcony. Sound passes easily over the plastic strands of this screen, is not lost or muffled as it would be by an ordinary fabric. A final acoustical refinement is achieved by the subtle curve of the chancel wall which is laid out, not merely for visual effect but to put the focal point of echoes outside the church so that none reach the congregation.

Heating is mainly by radiant coils located in the floor of the side aisles and the sanctuary (both areas are close to windows) and in the lower walls of the clerestory. Convectors are used in vestibules, sacristy, minister's study and toilets. To provide good circulation, ventilating fans supply air to six plenums above the main ceiling (detail at left) and into the nave through perforations in the ceiling tile. Return grilles are at the corners of the side aisles.

CONSTRUCTION OUTLINE: Foundations-concrete, spread footings, bituminous waterproofing below grade. Exterior walls-brick and stone. Interior-steel frame, wood partitions. ROOF-steel beams, metal deck, built-up roofing. INSULATION: Ceilings (nave) -perforated Transite, Johns-Manville Corp. Roofs and sound insulation-Fiberglas, Owens-Corning Fiberglas Corp. WINDOWS: Sash -aluminum, Flour City Ornamental Iron Co. Glass-Hylite, Mississippi Glass Co. HARDWARE-Yale & Towne Mfg. Co. FURNISH-INGS: Altars, pulpit, lectern, organ screen, etc.-L. Paulle-Midway Co. Lumite mosaic for screen-Lumite Div of Chicopee Mfg. Corp. Textone-Olean Tile Co. Baptismal font-Flour City Ornamental Iron Co. Seating-American Seating Co. Pastor's office-Modern Center, Inc. ELECTRICAL FIXTURES-Branham, Mareck & Duepner, Inc., Kurt Versen, Inc. and Swivelier Co., Inc. HEATINGradiant system. Wrought iron coils in side aisles, sanctuary floors and lower section of clerestory walls-A. M. Byers Co. Convectors-Trane Co. Controls-Barber-Colman Co. Specialties-Bell & Gossett.



Open jointed brick on the angled northern clerestory wall is laid in 2 ft. wide splayed panels, the center of the splay projecting 4 in. from the principal line of the wall. Panels add textural interest, absorb sound.

Towering window in the southern facade (right) lights the sanctuary and repeats the vertical accent of the bell tower. Spacing and depth of louvers in the side-aisles cut down the glare for minister as well as for congregation.





# CRYSTAL CHAPEL

BRUCE GOFF, Architect







matic exhaust vent-a device Goff used successfully in a wartime building at Camp Parks, Calif.

The translucent roof-walls will consist only of glass panels set in an aluminum grid. Each panel will be prefabricated as a

s structural aluminum cold cathode sandwich: two panes of tempered plate glass (pink to reduce glare) separated by a vacuumsealed space filled with pink glass fibers (for light diffusion and insulation). To favor acoustics within the chapel and break up exterior light reflection, the supporting grid will be shop fabricated and riveted to form diamond-shaped pyramidal glass bosses. Cold cathode tubes concealed under the glass roof, just above the grid members

(see detail) will transform the chapel into a glowing prism of light at night. Roof planes on the northeast corner are transparent to let visitors view the spire as they leave the chapel.

The interior of the chapel will be even more breath-taking than its exterior. From low entrances, the slanting roof planes will carry the eye up through luminous space to their apex 75 ft. above the floor. Seating is arranged about a central hexagonal glass floor light, set in the ceiling of the speaker's study



below and flanked by shallow reflecting pools. The elevated stone pulpit and sunken choir are reached through a basement tunnel which permits speakers to enter unobserved by the audience. Off the main auditorium are two small parlor-chapels for small meetings, and for weddings, or funerals. From the chapel's peak, Goff has suspended chains of silver and glass "to give a feeling of vertical stability as a counterpoint to the many angular planes of the interior."

Set between the triangular granite piers which support the pink roof of the chapel are wall panels of "Gemmeaux glass" a three-dimensional decorative form developed in France just before World War II. Made by sealing colored glass fragments between two sheets of plate glass joined together with a transparent plastic glue, the panels will be designed by Goff to harmonize with the rest of the structure. At night the brilliance of the Gemmeaux glass will be accentuated by underwater lights in the pools which extend into the chapel beneath these panels.

The sloping walls of the religious activities building are structurally the same as the roof of the chapel. Its main floor and mezzanine will be cantilevered from inner supports, independent of the wall-roof framing which rests on granite piers below the level of the main floor.

Practical in much of its reasoning of both function and structure, Goff's project is still clearly one of those creations of fantasy which are recurrent in architecture. Its spidery structure is reminiscent of the "Alpine Architecture" advocated by Bruno Taut as a culmination of the Expressionist movement that erected some fantastic buildings in Europe 30 years ago.

But this elementally exciting chapel may be far more at home in Oklahoma than either the "Cherokee Gothic" of its present buildings or the sophisticated contemporary manner projected for other additions on the campus (FORUM, Sept., '45). A member of Goff's staff suggests the impact of the chapel in this region of plains and pioneers: "It is a landscape that takes gratefully to an occasional bold accent. Such would be this great pink crystal, symbolic of Oklahoma's religious life laced with the sky, luxuriant with water, its hundreds of facets touched with glitter by day, mysteriously radiant by night."



Here at last is a rocket-flight use of techniques and materials never before available to realize a form of beauty and religious experience never before possible. Almost diametrically different in every concept from the Saarinens' seemingly traditional church (p. 80), this nondenominational religious center for the University of Oklahoma marks the farthest point of advance in a long architectural quest.

For centuries one aspiration of church architecture has been a crystalline purity of emotion based on other-worldly wonder. To this end the Gothic went as far as it could in subordinating its stone to walls of jeweled glass; the Baroque did what was then possible with clear glass to intensify the light. Now in Oklahoma's crystalline chapel worshippers will have the sensation of being miraculously suspended in a prism of warm light whose structural frame will be little more noticeable than the leads of a stained glass window.

Though the architectural success of such a bold project cannot be guaranteed in advance, Architect Bruce Goff has previously demonstrated his ability to translate fantastic concepts into workable structure. Among his soundly engineered fantasies are a wartime Quonset-type church for the Seebees (FORUM, Dec., '49) and a tepee-like church framed with welded oil pipes now under construction in the Oklahoma oil fields.

For the University's religious center, Goff has designed two separate but closely related buildings, completely devoid of conventional symbols of creed. Seating 300, the tall translucent chapel is planned to serve equally well for meditation, group meetings, weddings, or funerals. Linked to the chapel by a covered walkway is an appropriately horizontal building for less formal religious activities. Its main entrance is at halflevel, with ramps leading down to a parking space beneath and up to two floors of offices, counsel rooms, library, YMCA-YWCA rooms, and a social hall.

Mirrored in a circle of water-gardens, the chapel will extend a welcome in every direction, for it has no one main-entrance facade. Its diamond-faceted roof of rosy translucent glass framed in aluminum rests on triangular piers of unpolished pink Oklahoma granite. A 150 ft. chime tower of the same stone, tipped with wings of aluminum and glass, will be visible for miles across the plains.

The pools around the chapel serve not only as mirrors, but also as a cooling system. On hot days the water level will be lowered to let water-cooled breezes sweep into the building, and warm air will be drawn out at the roof peak by an auto-



# 600-BED GENERAL HOSPITAL in Arkansas changes the health map

ERHART, EICHENBAUM & RAUCH and EDWARD D. STONE, Architects KARL J. HOLZINGER, JR., Associate

The architectural distinction Ed Stone and Erhart, Eichenbaum & Rauch achieved in this new Medical Center sings out from every drawing. Its below-average cost of \$11,100 per bed—makes an equally pleasant sound and top note of all is the extraordinary new floor organization which saves so many steps and obviates so much confusion that it will surely be studied from coast to coast. Outstanding features of the plan include:

1. A never-before-used triangular layout of nursing units which cuts the maximum steps from the standard 64 to 48 ft.



2. A new nurses-service unit which is a similar step saver.

3. A corridor arrangement which gives all three nursing units on a floor direct access to the service wing without passing through each of them.

- 4. Daylighted corridors giving cross ventilation for all rooms.
- 5. A clinic in which patient and staff traffic never cross.
- 6. Entrance which divides outpatient and inpatient traffic.

7. Waiting rooms overlooking garden courts.

8. Complete interchangability of wards-semi-private, private, pediatric and bassinet rooms.

9. A central sterile island for surgical materials.

10. All mechanical services set in vertical runs at a substantial saving in construction and maintainence.

A. C. BACHMEYER, M.D., Medical Consultant E. M. FREEMAN, Structural Engineer LANDAUER & GUERRERO, Mechanical Engineers

Bold sensitive accuracy in every detail of the University Hospita would not have been possible apart from a new era of public healti planning which is getting under way in Little Rock. Medicine, educa tion, design and politics have united in this case to provide the very best in public health facilities. The 600-bed hospital will care an nually for 15,000 bed patients and the block-long clinic will handle about 100,000 outpatient visits. The medical school will graduate 100 much-needed doctors every year. Thanks to the conviction and enthusiasm of Arkansas Governor Sid McMath and University Presi dent Lewis Webster Jones, the project was never in danger of the "watering-down" that befalls so much official architecture.

### Structure

Every trick of modular construction and multiple room-use has been adopted here to provide extra advantages on an average budget. The frame of reinforced concrete slabs and flat beams is set on 22 ft column spacing. Regular stacking of all structural elements for the nursing floors-slabs, beams, partitions, mechanical and electrical services-makes for speed in construction as well as maximum re-use of forms and construction accessories.

All services are vertical with no horizontal runs to add expense or complicate maintainance. Mechanical services are located in islands at column points; heating risers at exterior columns with returns in intermediate mullions. Finned convectors for each half-bay are concealed in the spandrel panels. Arkansas has an advanced fire code that requires no masonry backup, so that the hospital will have a genuine "curtain wall" of cast, matte-finish aluminum panels with extruded aluminum grillage of uniform size. Stair towers and masonry walls of salmon-colored Roman brick provide lateral bracing.

## Multiple room use

The regular 22 ft. column bays are adaptable for any type of nursing room: four-bed wards (this type predominates throughout the hospital); two semi-private or private rooms; eight-bassinet nurseries or two three-bed pediatric rooms. Since plumbing and ventilation is available from the mechanical chase in every column and since electric distribution is provided in each permanent wall, any number of changes and rechanges is possible. Fixed interior partitions are of 4 in. tile; movable partitions are prefabricated panels of plywood mounted on gypsum and set in metal channels. All floors are of rubber tile; ceilings of acoustical tile.

The huge first floor clinic area is really loft space where treatment and examination spaces can be varied according to need. There are no interrupting beams and only drywall, modular partitions will be used.

### **Costs and financing**

The results of this careful study in modular design show up not only in added convenience but in cost totals. When the contract for this 458,170 sq. ft. hospital-clinic is let this fall it will probably not go above the present estimate of \$15 per sq. ft. or \$11,100 per bed-a figure well below the average cost of hospitals recommended by U.S.P.H. standards (\$12,400 per bed).

Plans have already received initial approval from the state hospital survey and from Mr. Moody Moore, local representative of the U.S.P.H. Following on final approval, the state legislature will appropriate half the necessary funds-the other half will come from the federal government under Public Law 725.







# STANDARD PLANS VS. ARKANSAS HOSPITAL

MULTIPLE WING, CENTER CORRIDOR PLAN Advantage: each unit dead end. Disadvantages: poor orientation — a large percentage of rooms will have north or west exposure.

> T-SHAPED, DOUBLE CORRIDOR PLAN Advantages: compact arrangement; central nurses' station and facilities. Disadvantages: poor orientation; inside nursing facilities; through traffic in the nursing units.

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IN-LINE, OFFSET CORRIDOR PLAN Advantage: good orientation. Disadvantages: excessive building and corridor length; excessive nurses' travel to rooms and facilities; traffic through the center unit.





TRIANGULAR UNIT PLAN Advantages: good orientation for all rooms (south or east); centrally located nurses' station and facilities; each unit dead end; short corridors ending in daylight; elevator traffic by-passes central nursing unit.

## Expert traffic control

Complex but unconfused lines of traffic tie together the many and various departments of the Medical Center with clear lanes for both bed and outpatients, students and staff, visitors and supplies—lanes that move in both vertical and horizontal directions. In some ways Arkansas achieves a distinct advance over the great Memorial Hospital at St. Lo, France (FORUM, Sept. '49) whose over-all organization it resembles in many ways. Both skillfully combine a widespread outpatient department with a vertical nursing tower; attain central placement of general services; make extremely efficient use of a single five-unit elevator bank.

## Indoor-outdoor clinics

Most striking feature of the Arkansas clinic layout is the apparent simplicity and very real pleasantness of its solution. At the main (west side) entrance, separate doors guide the visitor either to the hospital proper or to the clinic. The clinic entrance opens into a bright general waiting room whose glass walls overlook a large patio (see sketch at far right). Along the inner side of the room runs the long admittance counter, backed by record and file rooms.

Opening from this—again along a glassed-in hall—are the various clinics. These are arranged in a series of parallel wings connected along the west side by the patients' corridor; on the far, east side by the staff corridor. Each clinic is a dead end for both doctors and patients. The lines of traffic meet, from opposite directions, at the individual examination or treatment cubicle. There is no through traffic from one clinic to another. Small sectional waiting rooms are provided for patients in each department—each overlooking one of the small interior courts which bring light and air to the inner reaches of this vast floor. They will serve as a psychological antidote to the waiting periods made necessary by the routine of large clinics.

The staff corridor runs along a row of small individual doctors' offices and laboratories on the east side of the building; leads to the doctors' locker room and to the stair to additional staff facilities in the basement; also to administrative offices and hospital elevators.

## Varied vertical transportation

Elevators set in a single five-unit bank achieve savings both in space and structure. Separate entrances for patients and visitors prevent congestion. To reduce mealtime use of elevators, food is sent up to the floors in bulk lots; is apportioned in floor pantries, each of which has its own supply of dishes and glassware—and its own dishwasher.

Dumb-waiters connect directly with each floor and take care of transporting all sterile supplies. The central sterile supply room is set on the third floor with the manufacturing pharmacy and the blood bank—a position just above the surgical suite and just below the maternity floor, the two departments which have the greatest need of its wares. This direct supply system means that surgical material never leaves the sterile island in the center of the hospital to come in contact with any other traffic lines.

Pneumatic tube service brings messages to and from all parts of the hospital and clinic; has its headquarters at the message center just inside the main entrance.







# Revolution on the nursing floors

Admirable as is the organization of the outpatient department, the real revolution in University Hospital starts above ground level on the nursing floors. Here is a really new and strikingly efficient plan of patients' rooms and centrally grouped services. South of the elevator bank are set the triple nursing units. To the north all general supply and treatment rooms are concentrated in a single compact wing. A supervisor's desk just opposite the elevators provides control of all entrants to the floor—patients, doctors, students, supplies and visitors.

The triangular nursing units—which will soon have hospital men all over the country taking out their tape measures—saves a good 16 ft, on each trip a nurse must travel to her farthest charge, making it 48 ft. instead of the 64 until now regarded as the minimum to allow good exposure for all rooms on a 75-bed nursing floor. The rightangle arrangement of rooms around the nurses' station also gives a much greater visual control of the rooms. Service and utility space for each unit are set in a small reverse triangle at the back of the nurse's station—another step saver over the long, in-line arrangement. The nursing shortage, still at a critical point in Arkansas as elsewhere, will be relieved by the this nursing triangle that frees the nurse from unnecessary footwork, thereby making possible more intensive care of the patients.

Moreover, this grouping of the three triangular units allows each to



Leonard & Reynolds

have direct access to elevators and the north service wing, by-passing the center unit. The usual congestion and extra traffic near the elevators is removed from nursing units by this elevator corridor, which allows any one unit to be isolated without interferance with either of the others on the floor.

Switching from the nurses' to the patients' point of view-the triangle yields these design bonuses:

Short bright halls. The long, burrow-like corridors identified with institutions are notably missing here. Short, angled halls are brightened by large window areas at both ends. The ample light and short distances of these halls will encourage early ambulation. West windows will give cross ventilation to the halls and to most of the units, providing an outlet for prevailing breezes which enter through the carefully oriented south and east windows.

Compact cheerful rooms. Since all patients' rooms have protected exposure, continuous windows can be used, reaching from the ceiling down to 18 in. above the floor. The fact that patients can look out the windows from hed level gives a sense of added space to the four-bed,  $22 \times 16$  ft. wards.

Well-placed solaria. The sunrooms set in the tip of each triangular nursing unit have exposures both south and east, and are usable as visitors' lounges and dining rooms for ambulatory patients. In case of emergency, these rooms can be transformed into extra four-bed wards, since each has the necessary plumbing and electrical outlets.

Fully controlled admittance of light. Careful attention has been given to control of the large window areas. Six-foot overhangs run along the whole east and south sides—above every floor of the nursing wing. Small rectangular vents allow heated outdoor air to rise instead of forming warm pockets outside the windows. Interior vertical blinds, which do not cut out the view and which can be completely pulled aside, will provide light and glare control within the patients' rooms. Exterior vertical blinds of aluminium will be used for the west side corridor windows.

# Nine nursing floors for general care

No major changes were needed to fit this basic arrangement of sickroom-and-service wings to the requirements of the various hospital departments which are stacked as follows:

Second floor-surgical operating suite and 75 surgical beds.

Third—central surgical supplies, laboratories and 75 surgical beds. Fourth and fifth—gynecology and obstetric departments; total of 115 women's beds; 50 bassinets; 35 pediatric beds.

Sixth—large, completely-equipped pediatric department for 100 children (privately endowed by the \$500,000 William Buchanan fund.)

Seventh and eight-medical beds and isolation wards.

Ninth and tenth-neuropsychiatric division.

The initial building contract will include at least the first six floors. Additional floors will be added during the construction period as funds become available.

## Air conditioning

Air conditioning will be used only for special areas—surgical, obstetrical, pathology, and sterile supply services. As much as possible of the first floor outpatient department will be air-conditioned (the extent to depend on funds available).

# Bassinet nurseries vs. rooming-in plan

Since University Hospital is intended for those who cannot afford to pay for medical care, some desirable but space-consuming features of current hospital theory have had to be modified. Among these is the increasingly-favored plan for keeping new-born infants in the same rooms as their mothers. By an intelligent compromise, nurseries of eight bassinets are set between pairs of four-bed wards under close supervision of a single nurse who can help mothers as well as babies. Doors lead directly from nurseries to wards so babies can be brought to mothers without passing through general halls. This next-door arrangement for mothers and infants prevents the other three mothers from being disturbed, if one child is upset. Any four-bassinet section can be isolated when necessary.

# Observation platforms for operating rooms

In line with Dean W. C. Langston's belief that medical students should be able to watch operations at close range, the usual observation galleries—removed and high above the operating floor—have been omitted from this hospital. Instead, the operation rooms were enlarged and supplied with small portable platforms. Students will be able to watch from the floor of the room itself, as close in as the character of the individual operation will permit. One major operating room will be equipped for television transmission to a receiving room of the medical school.

# Medical school building

The plans for both hospital and medical school were worked out simultaneously for closer coordination. The school will be a sevenstory rectangular building each of whose floors is connected with the west side of the hospital. Main features in its design are: 1) north light for all student laboratories; 2) coordination of each department with those of the hospital—e.g. the pathology department of the school will be on the same floor as the clinical pathology in the hospital; 3) student entrance to each floor is coordinated with the service wings to ease observation and assistance. Record rooms and laboratory space for student work is also provided in the general treatment section of the hospital. Construction of the University Medical School will begin as soon as the hospital building is completed—which should be within the next two years.





# Remodeled dairy building becomes a colorful suburban house

This handsome house on the edge of a small Long Island pond results from the highly skillful combination of some very lowly materials—the thick granite walls of a burned down dairy building, 14 slim lally columns, a projecting second story addition of simple frame construction and, most important, colored paint applied with imagination. Viewed head on from the south across the pond, the colored squares of the upstairs balconies create the effect of a Mondrian\* in architecture. As the viewer walks by this facade and the colored sides of the various separating panels come into view, the effect is that of a changing abstraction—a dark gray panel appears next to the red square, light gray beside yellow, yellow beside gray, light blue beside dark blue.

A house of such artistic quality could only come from the sympathetic cooperation of an artistic designer and an artistic client. Architect Sert, who is responsible for the detailing, is such a designer, and the owner, who manages a New York City art gallery, is such a client.

In the conversion of the dairy building, very little was done to the ground floor. Double hung windows were replaced by fixed sheets of plate glass (double insulating glass in the living-dining area) set outside of the thick stone walls to add to the feeling of interior spaciousness. The ceiling was furred down 1 ft. to 11 ft. to provide space for heating ducts, a few partitions were relocated, the small bathroom window beside the fireplace was converted into a two-way wood box, and, due to the small 25 x 47 ft. size of this floor, an outside heater room was provided.

To create space upstairs for five bedrooms, three baths and a second living room (see p. 98) the 43 x 61 ft. second floor was extended beyond the granite walls in all directions and supported by gray painted steel stilts.

\* Painter famous for his color compositions in rectangular patterns.



First floor dining space viewed from living room (a and through opening in kitchen wall (right). Projof second floor in all four directions (see plan) pr first floor windows, creates sheltered terrace at edge of



LOCATION: Lattingtown Harbor, N. Y. ROBERT R. RAHMAN & JOHN H. LANGLOIS, Architects J. L. SERT, Consulting Architect PRESTON C. BRADY, Builder





GARAGE 19-0"x21-0" Free of the granite walls which confine the first floor layout, the second floor is expanded to accommodate a master living-dressing-bedroom suite, two children's rooms, a guest room and a maid's room. (While three bathrooms are also provided, it is somewhat surprising that none exclusively serves the maid's room.) Each of the four major rooms opens onto a southern balcony overlooking the pond—panels of insect screen slide into the walls, solving a storage problem, and panels of glass slide outside the walls. These rooms are further opened to the view by the upward sloping roof and ceiling which projects to form a sunshade (photo right) and by the transparency of the wire mesh parapet at the edge of the balcony.

CONSTRUCTION OUTLINE: Exterior walls—wood frame and sheathing, V-joint vertical white pine siding, metal lath and plaster. ROOFING—5-ply tar, felt and slag, The Barrett Co. Deck—Celotex Traffic-Top, The Celotex Corp. INSULATION: Outside walls—rockwool, Johns-Manville Corp. Roof—aluminum, accordion type, Infra Insulation Co. FIREPLACE: Damper—Heatilator, Inc. WINDOWS: Glass—!/4 in. plate, Libbey-Owens-Ford Glass Co. PAINTS—Dutch Boy, National Lead Co. ELECTRICAL FIXTURES—Century Lighting, Inc. KITCHEN EQUIPMENT: Range—American Stove Co. Refrigerator and dishwasher—General Electric Co. Sink—stainless steel, Tracy Mfg. Co. BATHROOM FIXTURES—Crane Co. Cabinets —metal, G. M. Ketcham Mfg. Corp. HEATING—warm air system, American Radiator-Standard Sanitary Corp. Chronotherm—Minneapolis-Honeywell Regulator Co.



Rear of house with its small, high windows faces north. Only large glass area on this facade is around the entry.



Second floor bedroom balconies (above) are separated by extensions of the interior partitions. Second floor living room (below) and master bedroom (bottom) are separated by bookcase glass screen and fireplaces.





SECOND FLOOR





# Plan house separates living functions into divergent wings

ION: North Castle, N. Y. JACKSON: Architect CRLY CONSTRUCTION CO., General Contractor



Photos: Ezra Stoller-Pictor



This unusual plan, almost a precise Y, is a precise solution to the conditions of orientation, site contours and room organization set by a thoughtful magazine editor for his suburban house. The young couple and three small children live well and entertain informally, complete with swimming pool, on a rocky ridge at one end of their five acres.

They sleep in the stem of the Y. In one arm they entertain; in the other they work. The gentle angles of separation give each wing privacy from the others, and an entryway intervenes between sleeping rooms and the rest of the house to provide a further measure of insulation.

By today's standards it is a luxurious home. The livingdining area covers more than 800 sq. ft., and work rooms (kitchen, garage, and editorial study) are also generous spatially. The biggest luxury of all perhaps is the great perimeter of the house, and the way each section is carefully tailored for its purpose. The perimeter of 365 ft. encloses a gross area of only about 3,200 sq. ft.

Peculiarities of the tough rocky site, which was impressed only by blasting, suggested the basic placing of the elements, and specific requirements of use for each wing were observed to complete the complex. The service and work wing is bent out to its obtuse angle with the bedroom wing in order to open up the entrance to the steep curved driveway, and to give welcoming breadth to what would otherwise be a narrow passage. The bedroom wing faces south for good insolation, and the living room is angled to face a 20 mile view of Long Island Sound. Cost: \$14.65 per sq. ft. CONSTRUCTION OUTLINE: Exterior walls-concrete block and fieldstone with aluminum insulation or cypress siding on studs with 2 in. Fiberglas, Owens-Corning Fiberglas Corp.; inside-plaster or plywood. ROOFING-4-ply tar and gravel, The Barrett Co. FIRE-PLACE: Damper-Bennett-Ireland, Inc. WINDOWS: Sash-casement, aluminum, ABC Steel Equipment Co. Glass-Thermopane. Libbey-Owens-Ford Glass Co. Weatherstripping-Accurate Metal Weatherstrip Co. FINISH FLOORING-asphalt tile, Tile-Tex Div., Flintkote Co. PAINTS-Samuel Cabot, Inc. HARDWARE-Schlage Lock Co. ELECTRICAL FIXTURES-General Lighting Co. Dimmers-Superior Electric Co. KITCHEN EQUIPMENT: Range-George D. Roper. Dishwasher-Hotpoint, Inc. Fan-Pryne & Co. LAUNDRY EQUIPMENT: Tubs-American Radiator-Standard Sanitary Corp. BATHROOM EQUIPMENT: Lavatory-Crane Co. Remainder of fixtures-American Radiator-Standard Sanitary Corp. Cabinets-Hoegger, Inc. HEATING-hot water, radiant system. Boiler and regulator-American Radiator-Standard Sanitary Corp. Burner-Petroleum Heat & Power Co. Pump-Bell & Gossett Co.

In the living room, as elsewhere, heat loss of large window areas is reduced by double glazing and counteracted by ceiling coils near the windows, supplementing the radiant heated floor slab.



Sheer glass wall of living wing, above, is effectively played against the glassabove-wood face of the sleeping wing. Below, living room viewed from entry.



# THE LONG ISLAND BUILDER'S HOUSE: a round-up of the best design and construct

tion ideas used by the merchant builders who serve the nation's biggest housing market

"I don't want to seem a traitor to California but the builders are really doing a job on Long Island." So said big West Coast builder Fritz Burns after visiting the great spawning ground of new housing for metropolitan New York. Nassau County is growing faster than Los Angeles; Long Island's estimated 1950 production is 40,000 houses. But what impressed Burns was not so much the scope of building as the effect of intense competition among the island's 200 large builders. He declared they were not only producing a better house today for less money but were also setting the pace, for the entire housebuilding industry, in efficient production methods to beat the ever-rising spiral of costs.

# **DESIGN.** Good design is beginning to figure in the builder's plans. But he has a lot to learn from architects

# **Design and layout**

The most striking change is the appearance in increasing numbers of a much lower, more rangy kind of house alongside the innumerable copies of the Levitt "contemporary" house which, with its great cap of an "expansion attic," is in reality a modified Cape Cod. The builder's name for this new kind of house is the "ranch" type, and the wise-cracking *New Yorker* calls it "Hopalong Cassidy Modern." Whatever its name, it is a house that expands out over the ground, all on one floor, not into the air. Where a third bedroom is either provided or foreseen, it tends to fatten up one end of the floor plan into an L and to increase the informality and interest of the house as a whole. By running the roof lines out beyond the walls as overhangs or trellises, the builder is able not only to shade the larger glass areas of his new windows but to give dominance to his horizontal ground-hugging lines so that the house is less of an ungainly box and more of a spread-out dwelling.

Whether this new kind of house has come in from the West by way of popular magazines, or whether it is a third cousin of the architect's "modern" is less important than the fact that the customers seem to prefer it; the old traditional designs are not selling the way they used to. The buyers want more convenience rather than cuteness for their money. And, whether they buy the ranch type or some other, the builders are giving them more flexible floor plans, no longer afraid to put the kitchen in the front of the house with the living rooms in the back, looking out on the privacy of a rear yard that can be developed as a garden.

If the first reason for the more contemporary approach is customer preference, the second reason is that the new builder house is simpler and therefore more easily adapted to mass-volume production. In place of twists and quirks the builders have discovered the virtue of new and interesting exterior and interior finish materials; Herewith FORUM examines some of the best design and con struction ideas produced by this competitive whirl. Editor visited 35 big-and-little subdivisions covering houses of al brackets. Highlights of the survey:

- 1. New and somewhat cleaner designed house types are being developed to meet buyer's more sophisticated demands.
- 2. The builders have developed a new set of cost-cutting production methods to beat higher costs.
- 3. They are improving bathrooms, kitchens, storage.
- 4. Merchandising methods are being overhauled to mee the demands of the new house shopper.

also they have discovered that well-calculated color schemes cost no more to put on than drab ones, so that color plays an important role for the first time.

Where the houses fall short in design, it is usually by the mis application of modern "features" in a way that is meaningless Trellises are put where they shade blank walls instead of openings and posts that hold up nothing have been added to the familian shutters that never shut. For this shortcoming it is unfair to place all the blame on the builders. The up-to-date architects who have taken the trouble and time to study the close problem of the builden house are few, and these few have so much work they have scarcely time to think. A close examination of the new Long Island houses with all their progress from tradition, will show what further progress still remains to be made.

# Under \$20,000

In adapting their houses to the merchandising requirements of the 1950 market, the smaller-house builders have followed two design trends. Some, like Levitt, have stuck to the basic Cape Cod shape, with its selling advantage of the expansion attic. The others have lopped off the attic for a longer, lower house with three bedrooms on one floor.

A good example of this latter type is the \$9,300 unit designed by Architects Matern & York for the Strausman Construction Company's 200-unit development in Hicksville. The house is an object lesson in how to combine economical construction with fairly presentable design. Except for some useless shutters and a tacked-on flower box under the bedroom window, the Strausmans have admirably avoided cluttering up the facade of their trim house. The floor plan is also better-than-average. The third bedroom can double as a multi-purpose room, with sliding wall-to-ceiling wood composition doors that can be pushed back to provide more open space in the living area. (The Strausmans, fainthearted about this innovation, offered customers the alternate choice of a fixed partition, but 90 per cent of their buyers took the sliding doors.) Also noteworthy in the Strausman plan is that the storage room has both an inside





and outside entrance, thus avoiding the mudtracking of bicycles, garden tools and other "outside equipment" through the house.

In the lower price field, Builders Irwin Chess and Nat Siegal offer a three-bedroom, one floor house which they sold for \$7,990 at their Babylon subdivision. (Since then cost rises have dictated a \$500 price increase. The attached garage is \$800 extra.) In their long (52 ft.) and narrow (23 ft.) plan, the kitchen becomes a modified "center hall" dividing living and sleeping areas. Instead of providing a storage room, as do most houses in this price range, the builders have included a cellar. Says Builder Chess: "The important thing about our house is that we are providing a threebedroom unit for the fellow who can only afford to pay \$50 a month. Our merchandising argument is that he has a complete house and he doesn't have to stand the extra cost of expanding either upstairs or outside."

Builder Jerome Miller has arranged his floor plan to give backyard privacy to the living area in his \$9,800-unit development in Bethpage. The kitchen and dining area are located in the front of the house, with the living area extending back to a window wall which looks out on the rear yard. Bulk storage arrangements in this compact house are located, economically, in the rear of the garage.

Split-level plans are not new but several Long Island builders have turned to them to separate living and sleeping areas without going to two-story construction. A typical arrangement is offered by Builder Bradford Stiles in his \$13,450 house in Huntington (see next page). Stiles' house has a half-cellar under the sleeping area, which he has divided between a utility room and a garage; above the living room this is balanced out by a large storage attic. The exteriors of such schemes are complicated and are one place where good architects are still needed.

Duplex houses—the building rage of the early Twenties—are making a comeback on Long Island, especially in areas close to the city where land is higher priced. At Bayside, where land prices run about \$60 a front foot in residential sections, Builder Lewis



Strausman house at \$8.50 per sq. ft. has three bedrooms.



A simply designed house paid merchandising dividends to the Strausman Construction Co. Perhaps the best test of the effectiveness of simple, relatively uncluttered design is that, in terms of the square feet of livable area provided by the builders, this house offered more for the money than any other three-bedroom house included in the round-up.



Chess & Siegal house demonstrates economical floor plan



The trend towards three-bedroom houses in the lower-priced market is well demonstrated in this \$8,500 house. Waste space is kept to a minimum in the 850 sq. ft. floor plan. Less commendable is the handling of the facade, with its many-jogged roof, variety of siding materials, and angled flower-pot holder.

Ben Schnall



Miller house is simple in both layout and finish



Here is another well-thought-out solution to the problem of providing three bedrooms and the necessary living-dining space in a small house. Main traffic circulation in this house is restricted to the front of the house. The living area is put in the rear, separated by a window-wall of glass from the patiogarden. Price per sq. ft.: \$11.25.


Huntington Photo Studio



Stiles houses hides split-level floor plan behind Olde Colonial facade







Klein & Teicholz provide economies of two-story construction



TERRACE



Builder Lewis Funk's semi-detached house tries to avoid the box look



B. R.

Funk is putting up 400 neatly trimmed semi-detached houses. I design, the units are a distinct improvement, in their plain handlin of brick and wood trim, over the traditionally big-and-boxy duplexes A two-story floor plan is used for each living unit, to conform t the New York City Code requirement that each unit be completel separate from the other.

The two-story single house is hard to find in Long Island sub divisions despite the fact that two-story construction still provide more space at less cost-per-cubic-foot than any other building form A recent experiment by Builder Kalman Klein and David Teichol on their New Hyde Park subdivisions indicates, however, that hous buyers still recognize this advantage of two-story houses. The two builders put up seven model houses on their development, then gave customers their choice of which one they wanted to buy. Six of the units were basically one-floor designs (some had expansion attics) only one was a two-story (pictured on the left.) It proved to be the most popular seller, at \$17,000. In floor plan, the Klein & Teicholz house shows some welcome changes from the old center hall arrangement. Circulation to any part of the house from the front door is adequately handled. A downstairs bathroom is located economically, underneath the upstairs bath.

#### Over \$20,000

In the higher-priced brackets, (\$20,000 and over) the Long Island builders have almost completely taken over the functions of the custom builder who dominated this market. The big luxury houses are museum pieces—as are the big, low-taxed incomes which were required to keep them up. Significantly, a great many of the higher priced houses built by merchant builders are being developed on old estates which are being carved up for real estate purposes. One builder, Sam Berger, bought out the entire village of Saddle Rock on the plush North Shore for his 250-unit development of \$25,000 houses.

The merchant builder's big advantage under these new conditions is his ability, through mass volume and construction efficiencies, to provide more living space for the dollar than the custom-work contractor can. A good example of this was seen in Builder Emannual Ballin's \$30,000 house, shown in last month's FORUM.

Among the most successful of the higher-priced builders are Newell & Daniel who are developing a 160-acre tract near Lake Success. The two builders expect to put up 75 units this year in the \$25,000-\$28,000 price range. To keep their production line as uncomplicated as possible, Newell & Daniel offer a choice of only two floor plans, with a further choice of three facade variations. The layout for the \$25,000 house, shown opposite, has generally good circulation. The combination den-bedroom, with its plastic folding door on the living room side, is an interesting example of multi-use space arrangement. The two-bathroom arrangement is to be found in most higher-priced houses. However, many builders don't take the cost-cutting advantage of putting them back-to-back as they are here.

Newell & Daniel house features tricky floor plan, tricky design

#### CALIFORNIA HOUSE that can teach the Long Island builders some lessons

In their field survey of Long Island houses, FORUM editors did not find one house which equaled, in price and quality, the Palo Alto (Calif.) builder house pictured on the right. This house proves that California's leadership is based not on climate—Palto Alto's is not too different from Long Island—but on good sense.

Like the Long Island builders, Joseph Eichler builds houses primarily to sell them. He sold out his 51-unit subdivision of these houses in a fortnight, plans three more tracts of similar houses. Palo Alto had never seen anything like his houses but it wasn't their novelty that sold them. It was the common sense proposition that Eichler offered more—and better—living space (1,044 sq. ft.) for the money (\$9,400) than other builders in the area. In short, he had a better product.

To get this better product, Joe Eichler did some hardheaded planning with his architects, Anshen & Allen. They planned the houses as houses should be planned —from the inside out. A floor plan, based on the 1950 living requirements of a typical Palo Alto family, was worked out. Then it was framed in, logically and without fuss. As a result, the buyers of Eichler's houses are getting a bonus of more living area in exchange for giving up whatever traditional notions they had about house design.





## **PRODUCTION.** The Long Islanders are old hands at stretching the construction dollar. This year: better production control; a switch to slab construction

Better production control on the site, rather than prefabricated miracles off the site, is the key to the cost-cutting, efficient construction on Long Island's typical 1950 subdivision. For many an Island builder, such economies are a grim necessity: the upward swoosh in prices this spring caught him with a subdivision which was sold out at firm prices but is being built under rising material costs. The result was that the builders have been tightening up their construction schedules all along the line to eliminate money-wasting loopholes.

Even small builder Bradford Stiles in Huntington (100 houses a year) finds it worth while to keep daily records on material flow and labor production on his Rollingwood subdivision. An important part of his production system is a bonus system for his crew foremen. (Stiles tried a bonus system for all his workers last year, found the record-keeping operation too complicated.) Each foreman is paid \$10 extra for each house he completes below a given number of hours. (Sample production goal: framing, without roofing and sheathing, 190 hours.) "The foremen are, in effect, subcontractors," Stiles points out. "The only difference is that we have tighter controls over them than we have over our subs."

#### Site Planning

In laying out their sites, Long Island builders are taking particular advantage of the savings offered by curvilinear street patterns. Curved streets mean less street to pave, provide more house lots to the acre, and serve to break up the monotony of their standardized houses. A good example of this is found at the Twin Oaks subdivision in Babylon where hundreds of similar houses are given better treatment through curvilinear streets. On this site, Builders Irwin Chess and Nat Siegal have added interest to their houses by preserving as many large trees as possible. Their surveyors spot each tree, then give the builders a stake mark on those which can be saved. The result is a landscaping bonus that makes the house-selling operation that much easier.

At Forest City subdivision in Wantagh, Builders Bernard Krinsky and Ernest Beck complete all their street and house grading-includ-

ing the removal or return of backfill-before the building trades come on the job. The reason: the site is unobstructed by dirt piles so that lumber can be moved in quickly and framing operations started without having "mountains" of dirt in the way. Says Krinsky: "As far as we're concerned, it means putting more money in the project before we make our first draw on building loan money but we find that it pays off in the long run."

At Saddle Rock, a 250-house development of \$25,000 houses, Builder Sam Berger is having the grading done by his own organization rather than subbing it out. After three months, he finds that his own men, using mostly rented machinery, are doing the job more cheaply than an outside contractor. This has the further advantage of giving Berger tighter controls over his grading operation, which will involve shifting 500,000 tons of dirt before the project is completed.

The most important change in Long Island construction methods involves foundations: the switch is to slabs. Almost three-quarters of the small houses insured by FHA this year will be basementless joba. Even in larger houses, slabs are being accepted both by the builder and his customers. Builder Berger offers his luxury-trade customers a choice of slabs or cellar: a majority of them choose slabs. (Among other things, it means a price allowance of over \$1,000 for the slab-selectors.)

The Long Island builders are taking the switch to slabs in their stride. In most cases, they are following FHA requirements. A typical FHA-approved installation is shown below. Three months



ago, the New York FHA office issued an order specifying inorganic insulation. Many builders are using glass fiber to comply with this new specification.

Production shortcuts are helping builders keep costs down in their slab-and-footing operation. Spread footings are seldom used. Although they require less concrete, the labor involved in the form work makes their overall cost too high. FHA accepts an 8 in. solid footing without forms and many builders are using this method. Foundations are dug out with flail diggers in a matter of minutes. Footings are poured from ready-mix trucks up to grade. After the concrete has set, short forms are placed on top of the unformed footing and more concrete poured to bring the overall footing high enough to meet FHA's requirement that slab floors be at least 2 ft. above street level. The diagram above shows one interesting way in which builders are getting around even this limited amount of form work. The shortcut consists simply of a concrete or cinder block which is specially cast to provide the necessary indent for insulation and slab.

#### **Cellars and crawl spaces**

Cellars are still popular enough with house buyers for many builders to include them in their construction programs. At the Rothrock subdivision in Hicksville, Builders Sidney and Bertram Roth offered customers a cellar for \$900 extra in their \$9,700 houses. Over 90 per cent of them took the cellars. In putting in cellars, most builders are careful to see that the cellar does not stand high on the site so that the low lines of their "ranch" houses are destroyed. To avoid this, they are providing areaways around cellar windows so that the windows can be placed below grade.

At his Ronek Park subdivision in Amityville, Builder Tom Roma is using crawl space construction in his \$6,990 house. Instead of di ging each crawl space separately, he has 15 vd. dirt-moving machin dig a 30 ft. wide trench straight down a line of house lots. The



Builder Romano's rented dirt-mover picks up 15 yards topsoil while going 2 miles per hour.

rented machines (\$130 a day) can dig foundations in this manner for 20 houses in less than a day. Bulldozers and smaller pan machine push the backfill in between the houses after the cinder block foundation tions are put in.

#### Frame construction

Most Long Island houses are basically frame constructed, despit the current ballooning of lumber prices. For most builders, pr cutting of lumber is a production "must." Builder Bradford Stile finds that precutting and bundling of lumber pays off on his 100 house-a-year subdivision. Says he: "It costs me more to start o with but I am sure that I'm not going to have my lumber kicke all around the site."

The basic framing operation is supplemented by an increasingl large number of fabricated units. Metal door bucks and window are common, even in \$7,000 houses. Builder Bernard Krinsky est mates a 30 per cent labor saving in the use of door backs, more tha offsetting their extra cost. At Twin Oaks subdivision in Babylor the builders use them except for the front and back doors where th cost of drilling to install weatherproofing makes a wood frame mor economical.

#### STORAGE. The customers want plenty of storage i their space-cramped houses. Faced with this dilemma the builders come up with some bright ideas

One of the persistent problems in the small, basementless hous is that of storage. The solutions break down to three categories: 1 general storage-the storage room, 2) bedroom storage and 3) spe cialized built-in storage. In each case, some of the Long Island build ers are coming up with some bright solutions.

Storage rooms for basementless houses are a merchandising "must" for builders. In smaller houses, the storage room doubles with th heating room. This year, more Long Island builders are taking inte consideration the fact that a storage room should have direct acces to the outdoors so that equipment like lawn mowers and bikes is no dragged through the house. In the small (800 ft.) Alto houses in East Hempstead, Builder Sam Grossman has turned his heater-storage room with its only door to the outside. In larger houses, the storage utility room is often placed with an entrance on the kitchen and to the outside. An economical solution is to build storage space into the rear of the garage, with access directly from the kitchen.

#### **Bedroom storage**

The small size of bedrooms in most builder houses calls for special consideration of storage requirements. The old-time bureau (which has been called "the silliest storage facility invented by man") is



arge cedarized closets, with separating built-in hest is provided by Builder Jerry Weiss. Note ush ceiling lights.



Floor-to-ceiling composition wood sliding doors (papered in this case) are widely used. Simplified construction eliminates header across top, also jambs.

J. Alex Lanaley



Small built-in table, which folds into wall when not in use, is part of prefab partition in Builder Silbert's house.



Waist-high "breakfast bar" is used to separate kitchen and dining area in Builder G. A. Mezger's \$25,000 houses.

being shuffled out. In its place, Long Island builders are providing built-in drawers and large closets. Builder Jerry Weiss in Woodmere builds in a six-drawer unit between two large sets of wall-toceiling closets. The Colby Construction Co. in Glen Cove is using the Cy Williams Sun Ranch house with built-in vanity between the two master-bedroom closets. In most other builder houses, floor-to-ceiling sliding doors have virtually replaced the old space-wasting hinged closet doors. A new wrinkle here is the use of sliding doors on overhead suspended tracks to avoid dirt-clogged floor tracks. In some of the best plans, however, there is still room for replacement of clumsy closets by standard storage cabinets.

#### **Built-ins**

Built-ins, of course, are not new to the building industry. Builders have been supplying ponderous built-in bookcases, china closets, corner cabinets for many years. In the new Long Island houses, however, builders are by-passing these heavy-handed, dust-catching gimmicks and providing efficient storage units which are notable, in some instances, for their clean-cut design. Particularly interesting is the design of kitchen pass-through units.

Among the more interesting built-ins is a card-table "closet" which is part of the fireplace wall at Forest City subdivision in Wantagh. Roslyn Builder Walter Marchant provides a neat built-in guest vanity with drawers. It is built into the side of a two-way fireplace and faces the main entrance door. An inexpensive wall table which folds back when not in use is part of the equipment in Leo Silbert's \$8,400 house.

The Long Island builders are steering clear of built-in television, for the time being, at least. Most of them report no customer pressure for it—despite the fact that Levitt has introduced it in his \$7,990 house. One builder makes provision for it in his fireplace wall, with access to the set for repairs from a storage closet immediately adjoining.

#### **KIIGHEN.** The Long Island trend is to make kitchens bigger, provide more counter space and storage. The reason: the kitchen still sells the house

The Long Island builders have always been a kitchen-conscious crew for the simple reason that the house buying ritual is usually presided over by the ladies. In every case, they have tried to keep their kitchens as big as possible, clipping space from the living area to do it. Since dining space is restricted in 1950's smaller houses, most builders try to provide some sort of space in the kitchens for dining purposes. It often consists merely of a breakfast bar. In larger houses it will often involve a separate dining area in the kitchen with a waist-high serving partition in between. In their Wilshire Hills \$25,000 house, Builder Bowers and Effron provide a 20 x 15 ft. kitchen with a complete set of appliances at one end and a large dining area with a porcelain tiled fireplace at the other.

#### **Kitchen** cabinets

Builders are paying more attention to kitchen cabinet details. Even in small houses, builders are specifying specially made wooden cabinets. They are careful to get a good expanse of flush working surface either by buying a manufacturer's modularly-designed "package" or by having a kitchen designed for them. This usually involves a specially fabricated plastic-topped working space which fits over a whole wall of kitchen appliances including a washing machine and drier.

Pass-throughs between the kitchen and the dining area are to be found in almost all small houses—and in most of the bigger ones. Many builders have specified specially fabricated pass-through units with storage facilities for dishes and silverware on both the





Compact kitchen in Miller house opens on two sides: pass through to dining area on left, breakfast bar on right.

Close attention to the problem of kitchen storage and adequate working space is evident in Bowers & Effron's \$25,000 house.

Photos (above): Ben Schnall

Typical counter lavoratory arrangement provides storage underneath, knee space under the rest of the table.

Ben Schnall







Small counter lavoratory follows trend in providing large vanity-type mirror along wall.

Builder Jerry Weiss tiles the top of his counter lavoratories in same color as the rest of bathroom. kitchen and dining-area sides. At Builder Jerome Miller's projec in Bethpage the kitchen is opened to the living-dining area on two sides. One section is a pass-through to the dining area, the other is a breakfast bar. Such wide-openness in kitchens is made possible by providing a kitchen ventilating fan to draw cooking smells to the outside.

#### BATHROOMS. That fine Victorian stand-by, the counter lavatory, makes a better-late-than-never comeback in the new builder houses

A common-sense 19th Century bathroom fixture is making a long overdue return appearance in Long Island builder houses this year. The fixture is the counter lavatory—a long table with a depressed wash basin. In Victorian times, this table with its heavy marble top dominated the bathroom. The 1950 models are made more compact to fit in with the smaller size of most bathrooms. They are improved over Victorian models in providing built-in storage: most have drawer space under the table, with provision for knee space.

The fixtures, which are available from most of the big plumbing equipment companies, have been handled in various ways by the Long Island builders. Most models come with a plastic topped table but Builder Jerry Weiss has eliminated this in his \$25,000 houses and tiled his table tops with the same color tile as the rest of the bathroom. Most builders using the counter lavatory provide a large built-in vanity mirror, extending the length of the counter. At their Hillside development, Klein & Teicholz provide a counter lavatory on one side of their bathroom wall, near the door, and a vanity table on the other. A fabricated waist-high storage unit to separate the "vanitory" from the water closet is another arrangement used by builders.

#### **Medicine chests**

The counter lavatories have resulted in some changes with regard to the old-fashioned medicine chest. The medicine chest—minus the door mirror—is being put on another wall. Better still, it is being replaced by a built-in or free-standing cabinet. Builder G. A. Mezger has eliminated the chest altogether at his Norgate project and is supplying a 5 ft. steel cabinet with a full length mirror on the door.

Built-in hampers are commonplace in most builder houses but Builders Leo and Dick Silbert provide a laundry chute directly to the basement. Another sales feature in the Silbert house is a small hinged-door which provides access from the bathroom to the top two drawers of the adjoining linen closet.

Most of the \$15,000-and-over houses include two bathrooms. However, in the \$11,000 house at Forest City subdivision in Wantagh, Builder Krinsky is supplying a second small bathroom in the big bedroom of his three-bedroom houses. It will contain a water closet and a wash-basin with a built-in hamper underneath. No Long Island house, large or small, has exploited the design and merchandising advantages of the two-passenger bathroom arrangement, which involves the partitioning of the various components of the bathroom so that the facilities can be used by more than one person at a time.

# **HEATING.** Radiant heating, hesitantly accepted at first as a cost-cutting device, is on its way to becoming a permanent fixture in the builder's plans

The swing to panel heating—pioneered on a large scale by the Levitts in 1947—is the big heating news on Long Island this year. Over half the FHA-financed small houses—and a sizable number of large ones—on the Island have slab heating.

Most builders accepted radiant heating without enthusiasm at first as a cost-cutting device. But experience has shown them that it speeds up their construction operations and also that customer resistancea strong factor in past years-is weakening. Most Long Island builders are using copper tubing which, because it bends easily, requires fewer joint connections. In small house installations, pipes are placed uniformly, usually 9 or 12 in. on center, with a separate circuit for each room. There is usually no variation in the pipe arrangement-no matter how the house is oriented-so that a uniform, quick construction job is had.

#### New combination

In the larger house field, Sam Berger provides an interesting combination of convection heating and panel heating in some of his Saddle Rock houses for reasons that make sense both design-wise and dollar-wise. Cost savings-involving several hundred dollars-are made by digging out a cellar for only two-thirds of the house. The other third is a slab with embedded copper pipes. The slab is the floor of the garage (which may or may not be panel heated) and the all-purpose room. This will, in most cases, be used as a children's playroom where warmed floors are particularly desirable. The panel heating circuit runs directly from the boiler with separate mixing valves and circulator, maintaining the comfortable low temperature required in a panel heating system.

#### Enter baseboard

Baseboard perimeter heating is becoming more popular with Long Island builders now that its prices are becoming more competitive with orthodox systems. In his Saddle Rock houses, Builder Berger provides baseboard heating, instead of the usual convector, along his big living-room picture window. Not only does it give him more even heat distribution at this high heat-loss area, but it permits better furniture placement, since the convector is low and almost flush.

#### SELLING. With houses harder to sell, the builder is taking a good, hard look at his merchandising methods once more and upping the quality of his product

As summer began, most Long Island builders had sold out their subdivisions and were settled down to the full-time business of getting houses built before winter curtailed their operations. One thing was certain, however: house selling was no longer an automatic order-taking process. For the first time in a decade, the builders had felt the full force of the buyer's market this Spring.

This new merchandising climate was anticipated by many builders in the closer attention they had given to their 1950 product. It was apparent that better design would be one of the most important bonuses-if not the most important-offered to coax New Yorkers out of their apartments and older houses into a new subdivision house.

#### Model house

As far as the actual selling operation is concerned, the model house is still the main base of operations for the builders. Long Island practice is to sell out the subdivision from the model house; as a result, great care is taken in preparing these showcase houses. Builder Kalman Klein in New Hyde Park was careful to furnish his group of houses with modern furniture and appointments. The overall effect was to give the interiors a cleaner, more open effect. (Most builders still persisted, however, in decorating their model houses with chintzy trappings straight out of a Betty Grable musical.)

Selling "extras" is a time-honored builder's custom. Most builders put up a basic model house and then tell the customers what they

can have added to it. At his Forest City subdivision, Builder Bernard Krinsky has a new switch to this. He is unveiling a model house this month which has all the extras in it. Instead of telling potential house buyers how much extra everything will cost, he will start out with the price of the complete house and then scale it down to the pocketbook requirements of the individual buyer. Says Krinsky: "The important point is that we will show them a house that will give them an idea of what it can look like, even if they can't afford the full package at the beginning. Also, we think that we will make more equipment sales by putting everything into the house than if we just show a price list for extras."

#### Dime exhibit

Seventy-nine Long Island builders have taken advantage of a unique selling aid provided for them by the Long Island Home Builders Institute and the Dime Savings Bank in Brooklyn. It is the Dime's "Home Buyer's Exposition," a permanent exhibition showing the latest offerings of builders and manufacturers of home equipment and materials. The exhibit covers 5,000 ft. on the main floor of the Dime's headquarters in downtown Brooklyn. In the



Schematic map of Long Island, featuring location of each builder's tract, highlights Dime Saving's exhibit. At right is portion of builder's exhibit area.

year that it has been open, over 100,000 New Yorkers have "shopped" through the exhibit, looking at the plans and pictures of the new builder houses. Each builder is allotted a 27 x 42 in. curved panel to present the pertinent facts about his subdivision. (Sample data: monthly payments, commuting time from New York, directions on how to get to the subdivision.) A 16 ft. wall map of Long Island pinpoints each builder's subdivision to provide quick orientation in locating projects.

Ben Schnall



Living room of Builder Klein's model house is tastefully decorated with simple modern furniture. Result is a welcome change from the over-decoration common in most model houses.



# NEW SCHOOL WING



Shaded by projection of roof and balcony-corridor, eastern transom windows insure uniform bilateral lighting on all desks. They still leave some problems of sky glare.

Structural fins on the western facade admit cool northern light and block the hot rays of the sun.













#### ngles vertical fins at 45° to overcome an "impossible" orientation, converts school board from classical design



 Old Administration Building will ultimately be altered to harmonize with modern additions, instead of compromising the new work.



PLAN - CONCRETE FINS AT WEST SIDE

LOCATION: Phoenix, Ariz. GUIREY & JONES, Architects D. O. NORTON & SONS, General Contractors

This is the school addition that converted the Phoenix School Board to contemporary design. The board gave up its plan for adding a neo-classic wing to its neo-classic oldest school only because it would have cost too much and its long west exposure would have been intolerably hot. But when the new wing was completed in contemporary design the board liked it so much they now hope to lift the face of the old building to make it as pleasingly contemporary.

The new homemaking wing had to have a 250 ft. western exposure —one which is virtually "impossible" from the standpoint of afternoon light and heat in Arizona, where the sun is merciless from May to October, brilliant most of the year. To surmount this obstacle, the architects produced a most effective and studied version of vertical concrete fins as baffles. As structural supports for the roof, these fins were one factor that helped hold the cost down to \$10.50 a sq. ft.—87 cents less per unit of area than a conventional building erected concurrently in Phoenix for the same purpose. Spaced 4 ft. apart and pointed northwest at an angle of 45° to the facade (see detail, left), the fins deflect heat and glare from the continuous strip windows behind them and provide privacy from the street. The architects estimate that substitution of the fins for conventional blinds saved about \$4,000 initial cost and several hundred dollars a year in maintenance.

The fins show exactly how far it is now possible to go—and also what it is *not* possible to achieve—in employing structural devices for controlling daylight. They keep out direct rays of the sun during school hours, yet admit plenty of light for classes of sewing and cooking. What they don't do, and can't do, is to give all the pupils a view and at the same time cut out that glare which is inherent in a view of the sky itself from inside a room. In other words, pupils either face in a direction where they see only concrete or they face the view with the sky unobstructed.

The fact that other forms of shading may yet have to be used to lick this last remaining factor still leaves the architects with credit for an important contribution.



Open-air corridors not only provide fire safety and a between-classes lift for students, but also dissipate echoes and the usual corridor noises. Wall space below transoms is filled with student's steel lockers running the length of the wing.

existing build

Designed for a full program of "family life education," the new wing contains twin food laboratories and multi-purpose sewing rooms, each accommodating 32 students, a flexible living-dining area, a pre-school play unit, toilet facilities and faculty offices. The plan provides for two additional classrooms to be built later at the northern end of the annex.

Fitted with normal classroom equipment scaled down for five-yearolds, the play school area has its own street entrance, walled patio, toilets and an isolation room equipped with one-way glass through which nursery pupils may be observed by students of child care and psychology. Informal instructions in food-serving, furniture arrangement, home nursing and allied subjects is conducted in the livingdining area.

Interior economies include partitions of unplastered pumice block, the consolidation of electric outlets for individual student kitchens in a long center table which provides added counter space, the use of "station wagon" guides instead of the usual ball-carrier type hardware on sliding windows in the western wall. Thanks to bilateral natural lighting, the overhead fluorescent tubes are rarely used.

The soothing effect of bright spots of color on doors and panels, warm redwood trim and informal furniture arrangements throughout the handsome building is evident in student reactions. Said one girl, "Who would ever think a school could be like home?"









Play school area is used as high school classroom during weeks when nursery school is not in session. Playroom windows, like others on the south, are shielded from the sun by an egg-crate arrangement of light horizontal and vertical concrete louvers.



#### COST BREAKDOWN

Structural steel         17,855.71           Concrete foundation, floors, etc.         9,980.71           Reinforcing steel         5,127.84           Terrazzo         816.48           Masonry work         16,040.16           Rough lumber         6,704.40           Millwork         20,085.84           Roofing         1,280.61           Fire doors         1,080.00           Plaster         7,093.44           Acoustic tile         2,789.64           Electric wiring         11,813.69           Toilet partitions         807.84	Excavation	\$1,193.40
etc.         9,980.71           Reinforcing steel         5,127.84           Terrazzo         816.48           Masonry work         16,040.16           Rough lumber         6,704.40           Millwork         20,085.84           Roofing         1,280.61           Fire doors         1,080.00           Plaster         7,093.44           Acoustic tile         2,789.64           Electric wiring         11,813.69           Toilet partitions         807.84	Structural steel	17,855.71
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Terrazzo         816.48           Masonry work         16,040.16           Rough lumber         6,704.40           Millwork         20,085.84           Roofing         1,280.61           Fire doors         1,080.00           Plaster         7,093.44           Acoustic tile         2,789.64           Electric wiring         11,813.69           Toilet partitions         807.84	etc	9,980.71
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Rough lumber         6,704.40           Millwork         20,085.84           Roofing         1,280.61           Fire doors         1,080.00           Plaster         7,093.44           Acoustic tile         2,789.64           Electric wiring         11,813.69           Toilet partitions         807.84	Terrazzo	816.48
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CONSTRUCTION OUTLINE: Interior partitions—pumic block, unplastered. Floors—concrete slab. Cellings—acoustic tile, The Celotex Corp., over metal lath, plaster. ROOFING—Pabco, Paraffine Co.'s. SHEET METAL WORK: Flashing—galvanized iron, Armco Co. Ducts—aluminum, Kaiser Permanente Metals. INSULATION: Roofs—4 in. wool, Eagle Picher Sales Co. WIN-DOWS: Glass — Libbey - Owens - Ford Glass Co. FLOOR FINISHES—Kentile, David E. Kennedy, Inc. COUNTERS, etc. — Formica, The Formica Co.

Hardware	1,170.54
Blackboards	762.61
Plumbing	
Painting & decorating	2,365.20
Asphalt tile	756.00
Carpentry, rough & finish.	11,792.83
Common labor	1,350.00
Glass & mirrors	2,696.76
Bond	1,451.00
Miscellaneous	859.46
TOTAL (contract)	\$145,096.00
Change orders	10,429.97
TOTAL COST	\$155,525,97

RANGES, WASHING MACHINES, DRYERS, DEEP FREEZE, etc.—General Electric Co., Westinghouse Electric Corp., Bendix Home Appliances, Inc. DISPOSALL—General Electric Co. HARDWARE—Sargent & Co. PAINTS—Pratt & Lambert Co. and Alumina-shield roof finish, Paraffine Co.'s. SWITCHES — Westinghouse Electric Corp. PLUMBING FIXTURES —Crane Co. HEATING—forced hot air. Grilles-Barber-Colman Co. Regulators —Minneapolis-Honeywell Regulator Co. Valves and water heater—Crane Co.



# CALDWELL AIR CONDITIONING — controversial new system uses many special devices

#### to get hurricane air speeds and "kinetic energy diffusion"

Mystery of the year in air conditioning is the Caldwell system. Everyone is talking about it-but hardly anyone knows anything about it.

Caldwell landed the most coveted air conditioning assignment in the country: the first group of buildings at the General Motors Technical Center. Caldwell made a preliminary layout for air conditioning the UN Assembly, and lost the job only when the competition lowered its bid \$250,000. His system is the only approved alternate to window units for Lever House in New York.

But still not a word has been printed about his methods except for a few paragraphs in FORUM'S July '49 preview of the Technical Center. And the confusion about Caldwell's work has certainly not been reduced by the fact that two small telephone exchanges in Michigan and perhaps one or two other small installations are the only buildings where architects, engineers and building owners can see a Caldwell system in operation with any type of cooling and so judge for themselves what the excitement is about. What follows is the first detailed report published on Caldwell's theories and methods.

A flood of rumors swirls around W. J. Caldwell, engineer, inventor and manufacturer of air conditioning systems. Word has spread that he handles air at unprecedented speeds and under pressures so great that it "behaves like a liquid instead of a gas"; that he "shoots streams of air across the ceilings" as a fireman directs water from a hose; and that he "washes" the windows with a flood of warm air shot from clear across the room.

The interest in Caldwell is due partly to the mystery that surrounds his work and partly to his envied assignments. But the most important element is this: if even half the rumors about the Caldwell system are true, it would be an answer to the office architect's prayer, for this reason: Caldwell has concentrated his attack on the tremendous amount of costly cubage and valuable space required by the large ducts and local fan rooms of a conventional low velocity system (up to 18 per cent added cubage in one recent example) and the still more valuable perimeter space required by window units of the usual high velocity system. The attraction of Caldwell's installations is that the ducts are so small they need very little added cubage, and he uses no window units.

Greatly over-simplified, the essential differences of the basic Caldwell system are set forth by Mr. Caldwell as follows:

"Special Caldwell fans drive the supply air under 4 in. initial water pressure and at velocities exceeding 6,000 ft. per min. into small ducts (10 x 16 in. at General Motors). As the air leaves the main ducts it is stepped down in Caldwell expander-silencers and fed through 5 in. hose to special Caldwell centrifugal ceiling outlets or finned or rifle wall outlets, all designed to give positive directional control to the stream of air whose velocity as it enters the room is up to 3,000 ft. per min. and never less than 1,700. Choke dampers are installed within expander units, powered by small electric control motors. Supply air quantities average about 2 c.f.m. per sq. ft. to be conditioned, but supply air quantities as well as supply air temperatures are raised or lowered to achieve desired room temperatures." Caldwell also favors his own design of washer, but this is not essential to the operation of his system.

On the matter of space and cubage saving, the advantages of the Caldwell system over almost all other current installations are clear On comparative costs there is a real question (details of which will be discussed later) since it takes nearly twice the usual fan capacity to build up his hurricane velocities and then a series of other expensive items to handle and slow them down again. There is com plete disagreement among air conditioning engineers as to whether the high velocities at which Caldwell shoots air into a room (1,700 ft. or more per min.) offer as great an advantage as Caldwell claims or whether they are actually a liability.

On this point the Caldwell position is uncompromising: "The prime reason for using high velocity is not space economy but to obtain much better temperature diffusion in conditioned space by driving the conditioning air into solution with room air, just as you effect mixture of two chemicals to effect a compound. Conventiona systems employ mechanical placement of air masses plus natural thermals to effect this solution. We employ the kinetic energy dissipation of high velocity jets. This principle is the important novelty of our engineering.

"No other system uses high velocity deliveries directly into the room itself, but only to aspirate room air through local conditioning devices."

To these Caldwell claims for kinetic energy dissipation the reaction of other engineers ranges from cautious approval to emphatic scorn.

The catalogue of other manufacturers and the technical literature of the past 20 years, these critics say, show a wide use of comparable velocities wherever they would actually work better.

#### Caldwell's background

Caldwell is a relative newcomer in full fledged air conditioning, but in heating and ventilating he is an old master with nearly 500 jobs to his credit, including big stores for Sears Roebuck and McCrory, a number of telephone exchanges, and some 30 Navy buildings. After working with him 15 months, the General Motors people say he is "fully conversant with the problems of moving air" and speak highly of him as an inventor. Twenty years ago he grew impatient with the slow velocities at which ventilating air was being moved, and began inventing fans, outlets, expanders and silencers for greater air speeds. From inventing he went on to maufacturing, opened his own small plant in Independence, Mo., which, with various subcontractors, can now turn out enough of the necessary Caldwell specialties to air-condition 1,000,000 cu. ft. a month (two or three buildings the size of Lever House a year.) But Caldwell is an engineer and inventor first, a manufacturer second. And next month he expects to announce arrangements for big league sponsorship, production and marketing of his inventions, with his firm acting as consultants and as a research and development staff.

Caldwell developed his high velocity program primarily to ventilate large spaces like stores, workshops, auditoriums, and telephone exchanges, where the long range of his air jets offered a major economy on duct work. To adapt it to all the deluxe requirements at General Motors has involved so many refinements and modifications (described in some detail further on) that the report has spread that "the longer Caldwell works with GM, the more conventional his system gets." To this the Caldwell staff replies indignantly:

1. "Caldwell always used velocities at least twice that of conventional practice. After 15 months of development work with GM, we have increased this to four times conventional practice.

"He always used kinetic energy diffusion and we still do at GM.
 "Caldwell always employed variable volume deliveries, in contrast to fixed fan speed of conventional system and we still do.

4. "Caldwell generally used the control principle of varying both air temperatures and volumes simultaneously, which is very unconventional in the trade, and still does. Further, he uses 'floating' controls, which is also unconventional.

5. "No other system has even employed volumetric expanders at the point of exits from ducts. This is our newest development."

#### Much special equipment needed

Details of the principal Caldwell specialties-fan, washer, expander-silencer, ducts and three types of outlet-follow:

Fans. Caldwell admits that "any attempt to get the pressures we employ with standard ventilating fans would, of course, consume too much power, since conventional fans suffer a sharp reduction in mechanical efficiency at static pressures in excess of 2 in." His associates believe his pressure vane blower is the first important advance in fan design since the old Sirocco was first introduced over 50 years ago.

Caldwell makes 14 sizes of single stage pressure vane blowers ranging in size from 5,000 to 140,000 c.f.m., 2 in. to 10 in. w.g. and four sizes of 2-stage blowers with capacities ranging from 3,000 to 25,000 c.f.m. and with working pressures from 25 in. to 250 in. w.g. His No. 20 fan used on the G.M. job is designed to deliver 20,000 c.f.m. at 4 in. w.g. with 18.3 h.p. motors (actually, 15 h.p. motors will be used).



Caldwell says one advantage of his fans is that they need 60 per cent less space than conventional fans of comparable capacity.

They use less space because while smaller, the blades turn faster, and because of Caldwell's patented vane on the blade which he claims gains efficiency for the fan by preventing air from escaping from the high pressure side of the blade to the low pressure side. He says that the fan approaches in effect a displacement pump, especially in the two stage unit which can develop pressures up to 250 in. w.g. The blower is driven by a wound rotor, or "slip ring" variable speed motor. Each size of fan is designed so that the size of its outlet matches duct sizes to be used. To achieve a closed air path, blowers are mounted in steel cabinets. For winter heating of air, a steam or hot water coil is located at the top of the cabinet.

Washer. Caldwell calls this special apparatus a centrifugal air washer-conditioner. It is a cork-insulated, stainless steel, funnel shaped cone, sizes varying in height, from 8 to 12 ft. Air enters from one side at the top, passing through a high velocity water spray from a grid of nozzles. This water also floods the walls of the washer, presenting additional cooling surface against which the air scrubs. Air spirals down around the shell of the washer in a centrifugal pattern. At the bottom it abruptly changes direction and is drawn to the top through an axial tube. The circular action plus the sharp direction change at the bottom does away with eliminator plates and is said to free entrained moisture. Dirt in the air is washed down into a sump at the bottom. Most of the dirt is carried away in the overflow to the sewer. Periodically the sump is cleaned of silt by flushing with a hose. No filters are used.

Duct work and elbows. Because ducts are under greater pressure from the fast-moving air, several differences exist in their construction. Main ducts are claimed to be from one-third to one-fifth those of conventional size, but gauges are about two sizes heavier. Sections are fastened together at flanged ends that butt together and are fitted with rubber or heavy paper gaskets which are drawn tightly together with a squeeze fixture that operates like a hose clamp.

Not only are ducts made tight at all connections so that the entire system serves as a pressure vessel, but special attention must be paid to keep down the noise level that usually accompanies fast-moving air. Elbows, "X" and "Y" connecting members are made with a maximum bending radius of one diameter.

**Expander-silencer units.** Located along the main ducts whenever air is to be taken off for an outlet are Caldwell's expander-silencer units. Primary purpose is to reduce the pressures from main ducts to the established velocities wanted for room distribution. Air passes through perforations of 1/16th or 3/32nds in. diameter in a metal plate. The plate can be turned inside a shell so that the volume of air passing through can be adjusted to room requirements. This is a permanent adjustment which is not changed unless the function of the room is changed. In addition there is a flap damper controlled by a room thermostat, the damper on the warm air duct working in opposition to that on the cold duct, one opening as the other closes. By its design, this entire unit serves to keep noises from passing out of the main duct into the smaller room-supply ducts.

Nozzles. Caldwell's nozzles are claimed to be an important part of his design and are necessary for proper delivery of high pressure air. He has three basic designs, the first of which is a finned type for use on walls. It is rectangular in shape and each segment of both horizontal and vertical fins can be individually adjusted. He says he gets better control because adjustment of all fins is at the leading edge. A second type, also for walls, is his rifle nozzle. It consists of a tube through which are horizontal, adjustable vanes. These fasten to a fixed spider at the inlet to the tube and to a rotating spider at the outlet. By adjusting the face spider, a twist is imparted to the interior vanes, which in turn imparts a rotation to the air. The degree of twist is said to alter the air from a pencil jet to a cone. A third nozzle, is a centrifugal ceiling type. Air enters a vertical tube on top of which is a volute or spiral scroll. This is claimed to give the air a twisting action as it leaves the bottom of the nozzle

through wide-angle slotted openings. Originally the nozzles were 6 in. in diameter but from capacity and noise level tests it was decided to enlarge them to 8 in.

There is considerable criticism of Caldwell's claims that he can make the air behave after it leaves his outlets. And air pattern and diffusion are the final test of how efficient his system is. He was able



to satisfy General Motors engineers, and he says he has a new motion picture showing smoke tests to support his claims.

Heretofore all Caldwell jobs had to be specially engineered by Caldwell himself, but now he is getting ready to publish all his engineering data and encourage other engineers to use his equipment.

As for costs, the Caldwell system starts with a real advantage for large spaces, where his high velocities can be used as a substitute for duct work, but on jobs like General Motors' office building he claims only that his system costs no more than the most expensive of his competitors: the window unit systems with individual controls. His No. 20 fan costs approximately \$1,200 with motor. His ducts save a little on metal, but little if anything on fabrication. His expander-silencers, not needed on any other system, cost \$67, and one is needed for each take-off from a main duct in the deluxe system. His wall outlets cost \$17, his new centrifugal ceiling outlets cost \$58. (For details of GM installation, see next page.)

#### CALDWELL AT GENERAL MOTORS—just how the new air conditioning system will work in its first big demonstration

The fanciest specifications ever required of an air conditioning system were set up by General Motors and architects Eero and Eliel Saarinen for the first unit of the GM Technical Center.

1. Despite the 367 ft. length of the building, all ducts must be small enough to pass through the triangular openings of its Zeppelin trusses (FORUM, July '49).

2. There would be no units at the windows despite the large glass areas in metal frames.

3. All private offices must have individual control, making possible a spread of plus or minus 5° from the overall thermostat setting. Similar control was required in open areas.

4. All air conditioning outlets must be in the ceiling at the nodes of the 5 ft. module system (FORUM, July '49), and be inconspicuous.

5. All risers must be concentrated in the service core flanking the center of the structure, since the office area itself was designed with no interior columns at all and only very small ones at the perimeter.

Caldwell landed the assignment partly because other engineers considered all these requirements a costly straight jacket, partly because the GM building engineers, Smith, Hinchman & Grylls, were sold on his system after working with him on many Michigan telephone exchanges, and partly because GM's famed research chief, Charles F. Kettering, found in him a kindred spirit and fellow iconoclast. Kettering was sure that most air conditioning engineers had their heads filled with unscientific preconceptions and knew too many things that were not so. He wanted his technical center's engineering to be as advanced as the research it was designed to house. Caldwell, like Kettering, was a free-wheeling inventor, and Kettering was quite ready to buy Caldwell's enthusiam for the high velocity principle.

#### Many changes during the mockup

Before Caldwell got the contract, however, half a dozen GM executives made a careful inspection of various Caldwell installations. And as the first step after he was hired they built a mock-up complete with all the trimmings to experiment with Caldwell's equipment. Here for some 15 months Caldwell worked with architects, engineers and GM people. It is significant that over this period ways were found to improve nearly all parts of the system except the washer and fan. Modifications were made in expanders, dampers, nozzles, the way ducts were fastened together, controls and other features. Considerable progress was made in noise reduction. From the experimental work came such new conceptions as a booster system, operated by a wall switch, that can quickly pump from 50 to 100 per cent more air into a conference room than is ordinarily needed. This gives a fast purging of stale air and smoke.

For GM, Caldwell decided, it would be better to use a two-duct system (common in more moderate climates) than to use a one-duct system with water supplied to local reheaters.

The GM Engineering building, for which the first two-duct system was designed, is long and narrow. On each of the three floors there will be a complete air conditioning unit located in a small area jutting off near the center. Because General Motors wanted to use its own compressors, four 20-ton compressors are on each floor and two water chillers that operate in conjunction with two Caldwell washers.

Outside air is mixed with recirculated air in conventional manner and drawn into the Caldwell washer described previously. From



each washer, air at temperatures of from  $55^{\circ}$  to  $60^{\circ}$  is drawn into a separate fan cabinet, each of which serves half a floor. In winter, air passes over a steam heating coil at the top of the fan cabinet, but in summer the heater is by-passed.

#### Two ducts provide close control

Air from the fan is blown into the two main ducts, which are rectangular in shape and  $10 \ge 16$  in. in size throughout their entire length. They are insulated with 1 in. of glass fiber. One is the warm duct, the other the cool. Throughout the year the temperatures of air in the two ducts is varied so that the entire system is kept at a level believed to be most nearly comfortable for everyone. The building will have scores of private offices, as well as open areas used for drafting rooms. Individual thermostats will permit adjustments of plus or minus five degrees from the overall building temperature.

At a point where the air from the fan divides into the warm and cool duct a swing damper is located that splits the air and proportions it between the ducts. The position of the damper is governed by a damper motor operated by a duct volume proportioning control located at the extreme end of the system. This control consists of a diaphragm-type floating switch with the two sides of the diaphragm subjected to pressures within the two ducts by means of connecting tubing. When the system is calling for a disproportionate share of air from one duct, thereby reducing pressure in that duct, the splitter damper is automatically operated to give more air to the starved duct until pressure is normal again.

In the warm duct beyond the splitter damper is a hairpin-shaped booster coil for heating the air. This operates all year. In winter the warm duct may be as much as 35° higher than the cool duct, but in summer the difference may be less than 10°. Humidity is centrally controlled and cannot be adjusted by room occupants.

Keeping down the noise level is a major problem in using high velocity air. The design of the air supply ducts calls for minimum turning radius of one cross section of the duct. No turning vanes are needed due to fluid air flow at pressure and velocities utilized.

From the main ducts air is carried to ceiling outlets through a 5 in. flexible canvas hose that is wire bound and coated with neoprene. Air leaves the main ducts through a metal expander-silencer unit. In addition, individual adjustment can be made through a pair of linked flap dampers that control the amount of air under supply



duct pressure admitted into the expander chamber. The damper on the warm duct operates in opposition to that on the cold duct, one opening as the other closes. Two motors operate these dampers. Such expanders can be adjusted to four sizes: 700, 1,000, 2,000 and 3,000 cu. ft. per min. at 4 in. w.g.

Flexible hose from the main ducts come together at a point where the air is mixed and then lead out again to one, two or three ceiling outlets. The usual GM arrangement is to feed two air control nozzles from one pair of expanders. Three outlets are tied together only for conference rooms or offices where a booster control is included.

#### Noise level at 52 db.

An accompanying drawing shows the design of the outlet's eight small blades that throw the air in a circular pattern close to the ceiling. The capacity of these nozzles for rooms with high ceilings is 400 cu. ft. per min., although they would be noisy. After its tests, GM decided to use the nozzles at 240 c.f.m. considering the ceiling height and in order to keep the noise level down to 52 db.

In GM's private offices nozzles are 10 ft. apart. Floor to ceiling height is 9 ft. 4 in. Nozzles are located along nodes of a 5 ft. module network which is designed to accommodate a sprinkler valve, a partition attachment or the air conditioning nozzle. While some motors are over corridors, others because of design necessity are over the ceilings of private offices and the 50 x 55 ft, drafting room. The drafting room is divided into north and south zones, each with a thermostat that controls air temperatures for ten outlets. Panel ceilings are designed for easy removal. Return air for all rooms flows through corridors to return air grilles and fan rooms.

Less expensive than ceiling nozzles are wall outlets which GM will use in some of its other buildings. Caldwell claims his easily adjusted fin-type nozzles provide positive directional control to the compartmented air jets for throws of 100 to 250 ft. In both ceiling and wall outlets, air flows across the ceiling and is said to be at zero velocity as it reaches the side walls. Caldwell claims that air leaves his nozzles in such a pattern that it creates just the amount of turbulence necessary for a thorough mixture that avoids layering and stratification.

Caldwell's change of pace is demonstrated by his heating system for the large engineering shop adjacent to the Engineering Administration building. It is a high-ceiling, one story building. Fans are in three penthouses on the roof. Bottom-type vertical discharge blowers shoot the air into a cluster of short transposition pieces that end in fin-type nozzles, the perimeter of which does not project beyond the boundaries of the pent house above. The installation is free of all ducts and is an unusually clean design. Filtering is done by means of fiber glass filters. There is no washer unit.

air are brought together in flexible canvas hose and carried to outlets.

#### GM's other building

Plans for several other technical center buildings are far enough along so that the heating and ventilating designs have been settled. General Motors unit coolers will be used for cooling private offices in several buildings where the entire structure is not being cooled. It is contemplated Caldwell heating and cooling will be used in the offices of the Metallurgical building as well as in a portion of the Service Center Shop building. In some buildings, including the Engine Dynamometer building, other types of heating, air conditioning and ventilating equipment will be used. Thus far, the Engineering Administration building is the only large building to call for the entire Caldwell air conditioning program.

How well this original Caldwell two-duct system will work during its first test only the next year will reveal. While Caldwell has done two telephone buildings that had a considerable amount of glass, he has never designed a job for as much glass area as the GM building. Both GM and Smith-Hinchman are confident that when the building is finished this fall the principal job will be one of balancing, which is always the real test of any air conditioning system.

"It's like a city water system," one GM official said. "We know we have plenty of supply, but we don't know yet that our distribution system is perfect and that everyone will get the amount he needs. But we feel sure we can adjust that."

After working with Caldwell for well over a year, the General Motors people are still satisfied he is fully conversant with the problems of moving air. They make it clear that they are not committed to any one air conditioning system. As progress occurs—and they believe the next year or two will bring a number of new developments in air conditioning—they will incorporate the best ideas and practices they can find. Just as this 360 acre development has given great freedom to the Saarinens' imagination, so it may be the means of encouragement to new techniques in air conditioning over the next few years.

## HANGING SHINGLES ON TRACK

A new system speeds application and cuts cost



Shingles are hung on tracks in this new application system, instead of being individually aligned and nailed. The resulting time-and-labor saving is as high as 50 per cent over the conventional double-coursing method which the new scheme is designed to duplicate.

Basic parts are the Nova-Speed shingling clip, a coated aluminum track in 8 ft. lengths, and the Nova shingle, an 18 in. red cedar shingle, kerfed—or slotted—in the back to hang on the track. The first (bottom) track is nailed to the studs over sheathing or insulation, then shingles are slipped in and pinned in place with a quick staple at top. From then on up, each track is nailed through the next lower course of shingles, 14 in. up from the track below. The kerf in the back of the shingle fits over the front lip of the track, projecting the butts outward to provide both heavy shadow lines and insulating space between courses. The bottom flange of the track is pierced with 3/16 in. holes on 12 in. centers to provide air circulation behind the shingles and also to drain any moisture that might penetrate in high winds.

Since these shingles are single-coursed, coverage is high. Two bundles of the shingles will cover one square (100 sq. ft.) at 14 in. exposure. Prices for carload lots of the Nova shingles, complete with track, are \$11.90 per square, unstained, and \$15.30 per square, stained.

About 11/2 labor hours are used to complete placing a square, according to contractors who have used the shingles. Figuring in labor, the cost per square (on wood sheathing) is figured to be \$36.17 for the Nova system, against \$48.60 for double coursed shingles, \$53.48 for wood siding, and \$46.18 for asbestos siding.



Kerfed shingles fit into track, as shown in drawings and photos, left. Track (drawing, right) is made of coated aluminum with notches for nails on 4 in. centers. Single shingles can be replaced easily if they are split.



Track projects bottom of shingles out from wall, making a deep, distinct shadow line between courses. Clutch of track also helps prevent curling in shingles.

# Owners LIKE what they GET in **Rō-Way** Overhead Type Doors



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#### THEY LIKE RO-WAY QUALITY

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All mortise and tenon joints glued—then *steel* doweled. Muntins, rails and stiles *accurately* squared up. Sections rabbeted to assure weathertight joints. Track rollers built with double-thick tread. Springs *Power-Metered* to the weight of each door.

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A perfect example is this outstanding women's shop in Long Beach, California.

To increase customer traffic, Kenneth S. Wing, A.I.A., decided to create an inviting open-air atmosphere which would eliminate the usual building line barrier and put the attractive interior on display.

To achieve this effect Mr. Wing specified Kawneer Patented Flush Glazing Sash, one of the many modern Kawneer Stock Metals.

The face of this sash is flush with surrounding wall and ceiling surfaces, because all projecting members are eliminated. To the eye, the surfaces on both sides of the glass appear to be a single smooth plane, continuous and uninterrupted by glazing sash.

By using such Kawneer Stock Metals you can meet your clients' demands for lower building costs — and you can reduce your own operating costs. Kawneer Stock Metals are far less costly than special, madeto-order assemblies — and they eliminate time-consuming drafting and detailing in your own office.

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Plastic - chromium sculpture (1946) expresses "a drive to dissolve solid volume into defined space. When I think of sculpture I cannot think of static mass."



#### REVIEWS

MOHOLY-NAGY, A Biography by Sibyl Moholy-Nagy. Introduction by Walter Gropius. Harper & Brothers, 49 E. 33rd St., New York, N. Y. 253 pp. 61/4 x 91/2. Illus. \$6.50.

Among the hopeful generation of artist-designers who rejuvenated art between the two World wars, Lazslo Moholy-Nagy stood out as "the fiery stimulator". In an Introduction to this excellent biography written by Moholy-Nagy's wife, Sibyl, Walter Gropius says of him-"His genius ventured into all realms of science and art to unriddle the phenomena of light and space . . . In painting, sculpture and architecture, in theater and industrial design, in photography and film, advertising and typography, he incessantly strove to interpret space in its relation to time, that is, motion in space." Just as important as the artistic breadth and depth indicated by this tribute is the relation to human needs which Moholy incorporated as the basis of his most abstract designs-a relation, sometimes obscure in his art, but one which reassumes its proper place in this study of his life and work. He sought to express "the basic ideas which keep human content alert and vital."

During his twenties Moholy-Nagy set aside for ten years his promising career as painter because it seemed to him at the time that "canvas" art had no longer a place in everyday life. Without forsaking for a moment his interest in the problems of light and vision, he then set out to study and apply these to arts more directly connected with human use. He studied construction and motion, analyzing his theories in the famous space-light Modulator which expressed so well his love of motion and precision (photo lower left). In 1923, when he was only 28 Moholy was appointed teacher and head of the Metal Work-*(Continued on page 126)* 





Photogram (left) and typographical painting (above) explore everyday forms and techniques.

Light-Space Modulator (1922-30): "a construction — half sculpture and half machine."

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# These representative buildings with PC FOAMGLAS

The concrete roof deck of the new Sears, Roebuck store at Winston-Salem, North Carolina, used as a parking lot, is insulated with PC Foamglas. This prevents excessive heat travel into the salesrooms below, helps to keep customers cool and comfortable. The Foamglas blocks are laid on the roof deck, then covered by a five-inch concrete traffic slob. PC Foamglas carries heavy loads under the cover slab without fear of rotting, swelling or crushing. Architects: Shutze & Armistead, Atlanta, Georgia. General Contractor: Moorhead Construction Company, Durham, North Carolina.

A

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Here you see PC Foamglas being installed on the concrete roof deck. Later, built-up felt roofing was applied and a poured concrete traffic slab completed the construction. When installed according to our specifications for recommended applications, PC Foamglas retains its original insulating effectiveness.

This is FOAMGLAS® The entire strong, rigid block is composed of millions of sealed glass bubbles. They form a continuous structure, which has unusually high resistance to moisture, vapor and acid atmospheres, is noncombustible, verminproof and odorless. In those closed glass cells, which contain still air, lies the secret of the material's long life insulating efficiency.

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the bathroom

Cadet built-in shower cabinet. A Fiat glass door greatly improves any shower. Tile, marble, structural glass, or metal showers are enhanced in appearance and practical usability when equipped with a Fiat door. Perhaps at no other place in a house can so little cost mean so much in desirability. I The solid extruded metal used in all Fiat doors is a much superior type of construction that permits a fine elite styled frame combined with strength. I The Fiat Dolphin shower door is constructed of extruded solid brass, heavily chromium plated with continuous piano hinge forming a smooth-working, rigid door. Double friction bullet catches, offset handles and water channel to prevent dripping on floor are features that mark the Dolphin as the finest in shower bath doors.

The Zephyr is a medium priced door, styled same as the Dolphin but made of extruded aluminum with satin aluminum finish.
Standard size of both the Dolphin and Zephyr shower doors is 72" high for opening 24" wide.
The Neptune is the lowest priced Fiat glass door. Made of one piece heavy extruded aluminum with satin finish. Size 24" x 64" and is reversible for left or right hinging.

¶ All Fiat doors are simple and easy to install on Fiat shower cabinets, tile, marble or structural glass showers.



Fiat shower doors have neat, modern styling combined with maximum strength.

Dolphin door installed on Fiat

#### FIAT METAL MANUFACTURING COMPANY

Three Manufacturing Plants 9301 Belmont Ave., Franklin Park, III. Long Island City 1, N. Y. Los Angeles 33, Calif. In Canada—Fiat showers are made by the Porcelain and Metal Products, Ltd., Orillia, Ontario

#### REVIEWS

shop at the Bauhaus. In that center of advanced experiment, he distinguished himself by a fabu lous zeal to tackle any and every problem. With Gropius he prepared 14 textbook volumes or architecture, written by the various Bauhaus members. His Metal Workshop was used to attack the problems of mass production and of light in building. His solutions achieved the same precision he had formerly shown in his paint ings and constructions. The results of this study are not only evident in the fixtures he produced at the Bauhaus but they vitally affected his later creation of metal-and-plastic sculpture. For him, there was "no esthetic difference between a fine lamp and a piece of sculpture-they were both conceived as carriers of light." A man with such clarity of vision, together with the talent and training which enabled him to awaken it in others, was bound to have an eventful life. Mo holy-Nagy had such a life.

When political pressure caused Gropius and a number of his Bauhaus staff (Moholy among them) to resign in 1928, Moholy worked as a de signer, first in Berlin, then for six months in Holland and for several years in England. His enthusiasm for every type of project from salestags to theater sets, from magazine covers to experimental movies, was summed up in the crede he later enjoined on his students: "There's no task too small and no project too big to make it a manifesto of incorruptible design."

His last and most total adventure, in a career which his wife has subtitled "an experiment in totality," came in 1937 when Moholy was invited to head the "New Bauhaus" in Chicago. This school of design was to be sponsored by the American Association of Arts and Industries. Just a year after the school's enthusiastic opening, however, a depression threatened. The supporters not only failed to produce the promised funds, but tried to blame its closing on Moholy's poor management. The obvious facts of the case. as well as the loyalty of the staff and of several of the Board members, settled the case in Moholy's favor when it came to court-but it seemed the end of his American ideal. Single-handed he set out to develop in the U.S. "an institution which strives for the synthesis of all specialized knowledge . . . we have lost access to entirety because we have learned to concentrate on parts alone." In an epic car trip he traveled up and down the country visiting manufacturers whose names he had picked out of Dun and Bradstreet. So impressed were these with his practical grasp, as well as his design zeal, that all of them (except a mill in Pennsylvania) agreed to provide the school with working materials-wood, metal, plastics-and a number agreed to refer to it their own design problems. The death of the "New Bauhaus" was really the birth of the "School of Design." In spite of scanty funds, sickness, depletion of students, teachers and materials by the war, and outside interference (both wellmeaning and not) Moholy's ideal of teaching increasingly justified itself in the work and development of his Chicago school. The price of the (Continued on page 132)



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# This builder program

17,000 house hunters lined up Saturday and Sunday for an opportunity to go through the pilot house. (Price: \$10,950) . Yet, more amazing is the fact that other builders' homes in the Chicago area—completed months previously—still remain unsold!

Builders and real estate people state, without reservation, that overwhelming success of this "House of Charm" project is complete General Electric Kitchen-Laundry. Why not let Gene Electric help sell your houses faster, too?

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- One source of supply for matched equipment

... a full line of cabinets and appliances.

- Assistance in designing and improving kitchen layouts for your houses.
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n Saturday, 7,000 people went through the pilot house, n Sunday an estimated 10,000 people went through.

rospects were frankly amazed, and the question asked tedly was: Do we get all this General Electric equipment the house? The answer 'YES' surprised and pleased them.

eople who did not have sufficient cash with them dug their pockets for as little as twenty dollars and asked her we would hold a house for them until they could get

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You can put your confidence in-



#### REVIEWS

struggle, however, was a high one-his death of leukemia in November 1946 at the age of 51.

Since then, the "genuine success" which Moholy-Nagy believed was "measured in intellectual influence that can be achieved not in a lifetime, but in the lifetime of generations" seems more and more assuredly his. His wife has rendered his admirers, and modern design in general, a great service by her understanding, vivid and objective account of a "total" artist. —S. K.



Glass-covered hall by Hofmann & Dick (left) can become an open. arena (below).



#### MODERN SWISS ARCHITECTURE, 1925-

Edited by Max Bill. pub. Karl Werner, Bar Switzerland. In U. S. Wittenborn & Co. 38 E. 5 St., New York, N. Y. 208 pp. 81/4 x 113/4. Illus. T in English, French and German. \$11.

The assured and varied output of modern Sw architects has aroused international interest a admiration during the last decade or so. It ironic that during the same period (as Art Editor Max Bill reports in his Preface) the co servative group, which earlier banished Ma lart's bridge designs to remote mountain pass has again stirred for a concerted "return to n classical, neo-romantic, neo-empire styles."

This selection of modern Swiss building reveals, however, a design movement of suintegrity and ingenuity that any permanent bassliding seems doubtful. Readers already familwith G. E. Kidder-Smith's excellent photograph study of Swiss building (FORUM, March 1955 will find here a more thorough technical trement of many of the examples pictured the Each of the 56 buildings is illustrated by interand exterior photographs, floor plans, elevation detail drawings and construction data. The loo leaf sheets are held and indexed in a be portfolio.

The recreation hall above shows Swiss inger ity at its typical best. The glass-covered hall transformable into an open-air arena with dou led seating facilities; glass-and-steel roof se tions roll back into concrete end frames. —S.

**CITIES IN EVOLUTION.** By Patrick Geddes. N revised edition. Oxford University Press, 114 Fi Ave., New York 11, N. Y. 241 pp. 51/2 x 83/4. III \$3.75.

Whatever may be our planning faults today, one is likely to hear the remark, "There is need for town planning. The cities are all buil This attitude—which Patrick Geddes found most formidable opponent at the turn of the co tury—has long disappeared, largely due to l (Continued on page 138)



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#### REVIEWS

energetic efforts. Through lectures, writings and exhibits on three continents he completely re vitalized, if not entirely recreated, the art of towr planning. He preached, not a set doctrine of either the garden or the imperial city plan, but a method of open-minded study. "The great thing," he said, "is not so much to control and administen things and people, as to inspire, to arouse youth to carry out its aspirations towards life at its best." Since Geddes practiced what he preached, his great influence has been spread through the enthusiasm of his disciples rather than textbook appraisals of his ideas.

Cities in Evolution, the most complete expression of his thought, has until this new edition been out of print for over 30 years. Like most of his writing, it was intended as a "political tract to precipitate action in his own time," and it contains a good deal of material that is of only historical interest to us today. But his ideas and words are still vital. So is his lifelong goal: that city as well as country people might have "a livelihood which is at the same time a life."

Geddes' basic aim was to raise the level of city life from that of the present "Paleotechnic" futility, a confusion resulting from the Industrial Revolution, to a "Neotechnic" beneficence, where human culture patterns would be assisted and amplified rather than crushed. This aim which he had in common with all the critics and reformers of the Nineteenth Century was aided by his remarkable "synoptic" vision (a word, coined by Aristotle and recirculated by Geddes, meaning the ability to see complicated life-patterns as a single whole). He seemed able to see immediately across the artificial lines which had rigidified between sciences. Putting to intellectual use the lately discovered physical law of relativity, Geddes said: "Relatedness is the parent of reality; objects by themselves have no meaning . . . Sociology, is not-as so many think-some new, separate, remote science, it is first of all the widening outlook of biology." He urged the co-consideration of eugenics and civics (a revolutionary thing at the time)-"Many of those whom eugenists are apt to think of as 'degenerates' in type and stock are really but deteriorates, and this in correspondence to their depressive environment."

His reputation as a prophet is certainly upheld by the republication of this book written before 1910. Warning of the dangers of 'conurbation' in the U.S. (a Geddian term to express the swelling of individual cities to join each other in a single inchoate mass) he warned, "the Pittsburg region is but a conspicuous example . . . in which increase and pressure, if not foresight, must soon involve a conurbation survey and reorganization." The subtler malaise which arises from unplanned cities, and of which we are becoming increasingly aware, was evident to Geddes in 1899: "The endless grid of an American town, with no center, no gardens, and no limits horizontally or vertically, can but produce confusion of soul."

Although his construction of *Cities in Evolution* is a bit rough and ready, it is good to be able to consult the great Mr. Geddes at first hand.—S.K. (Continued on page 144)



says builder Arnold Hartmann of Oak Hill Village in Newton Centre, Mass.

"When anyone asks me why Oak Hill Village homes sell so readily, the answer is simple," says Mr. Hartmann. "The reason is that these homes offer utmost value to the prospective purchaser. All-electric equipmentincluding modern Electric Ranges-combined with good design and construction -make them a good buyand they sell." Successful builders everywhere have found that it pays to install Electric Ranges.



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graceful as well as festive-create visual harmony between the enormous proportions of the Olympia Hall and the small exhibit units, which are also framed and supported by aluminum tubing (see plan and large photo above).

Sergei Kadleigh, the imaginative designer of

the show, has used alum-

by Britain through wartime use. The elements are extruded, cast, drawn, wrought and rolled; are joined by pop-riveting in



aircraft fashion. The entire display-masts, banners, tubes and coils-was designed to be quickly set up and dismantled.

#### ARCHITECTURAL MOVIE RATES "A" FOR EFFORT; "B" FOR PERFORMANCE

American Homes, the first in a series of 16 mm. films by Strick Film Co., Los Angeles, Calif. tries in an 8-minute span to: 1) show the historical background of conventional U.S. houses and 2) give an insight into modern planning. To do either in the short time would be an achievement; to do both is impossible. Although lacking sufficient architectural focus, it does, however, provide enlightening glimpses of houses by Charles Eames, The Architects' Collaborative, and F. L. Wright. Future issues should be of interest.

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# Sales are Made or Lost in the Kitchen!

Today more than ever before, new home sales are being made (or lost) in the kitchen. Architecture and location are important, but the kitchen has become the heart of the home, and home buyers are demanding modern, convenient, eye-appealing kitchens.

RANGES . REFRIGERATORS . DISHWASHERS . DISPOSALLS® . WATER HEATERS . FOOD FREEZERS . AUTOMATIC WASHERS

Homes...

# All-Electric Appliances In The Kitchen!

MEN build houses, but women buy homes. When you please her, the sale is made. Hotpoint All-Electric Kitchens appeal to vomen. Women know Hotpoint quality and how Hotpoint adds beauty, efficiency, comfort and gracious living to any nome. They know they can enjoy extra hours of leisure when totpoint work-saving appliances are at their command. Men also quickly appreciate the engineering skill, economy and convenience of Hotpoint Kitchens.

The weight and scope of Hotpoint advertising and the word-of-mouth praise for Hotpoint performance have taught nome buyers to look to Hotpoint for the finest first. Hotpoint's All-Electric Kitchens and All-Electric Home Laundry Equipment are your key to easier and faster home sales.

Hotpoint appliance prices are strictly competitive. In most cases, the entire cost of an All-Electric Kitchen and Home Laundry can be absorbed in the buyers' realty mortgage with slight effect on their monthly payments.



Talk to the Hotpoint distributor in your territory or write to Hotpoint, Inc., 5600 West Taylor Street, Chicago 44, Illinois, and ask for Kitchen Planning information from our Builder's Division.

Close the Sale with Hotpoint!

**CLOTHES DRYERS • ROTARY IRONERS • CABINETS** 

5600 West Taylor Street, Chicago 44, Illinois

(A General Electric Affiliate)

AMALLA LANAXAMADLULU MADAAAAA

heck these 5 reasons why you should specify **U·S·S Stainless Steel.** 

- Stainless Steel provides a high strength-to-weight ratio.
- It retains its lustrous beauty and superior strength indefinitely with a minimum of care and maintenance.
- It remains virtually unaffected by corrosive attack, by extremes of heat and cold.
- It offers unsurpassed resistance to abrasion, wear and severe service. It is incombustible.
- It does not bleed or discolor adjacent areas.

U·S·S Stainless Steel is available in a type and style to fit practically any application that you may be considering. This perfected, service-tested stainless steel comes in sheets, plates, strip, bars, wire, tubing and piping of practically any dimension; in structural sections and special shapes of great variety. It can be obtained in all the standard architectural surface finishes.

U·S·SStainless Steel has an extremely wide range of applications. Because of its light-reflecting properties, stainless can be combined with concealed lighting to provide strikingly beautiful wall surfaces. Stainless-faced fully-insulated curtain walls can be used in place of brick, stone and tile construction. These panels provide substantial economies by decreasing the load on foundations and building framework, and also provide additional usable space.

There are literally dozens of other ways in which you can use U·S·S Stainless Steel in both large and small construction projects. For lasting beauty, economy and outstanding utility . . . specify U·S·S STAINLESS STEEL . . . probably the most permanent building material known.

> The new Lawrence School in San Mateo, California, embodies many of the latest features in school construction. Note particularly the use of U-S-S Stainless Steel in cornices and columns. The lasting beauty of stainless steel is a perfect complement to the building's modern lines. Ernest J. Kump, Architect and Mark Falk, Structural Engineer, San Francisco. Sheet Metal Fabrication by McKune Metal Products Company, San Francisco.



U·S·S Stainless was chosen for this job, not only because of its resistance to atmospheric corrosion, but because of its exceptionally pleasing appearance when used with basic texture materials to provide contrast between rigid patterns and plain surfaces.

#### Here's where U·S·S Stainless Steel will improve appearance, prolong life and reduce costs

Gutters, downspouts and flashings · Copings, marquees and cornices Window frames, sashes and screens · Show windows Sculpture, relief or free-standing · Elevator doors and cars Heating panels · Stair and door nosings · Hardware Fireplace facings · Multistoried building pilasters · Store fronts Counter surfaces · Parapets and spandrels · Wall panels · Chutes and conveyors · Doors, interior and exterior · Kick and push plates Sills · Stair rails · Escalator housings · Interior and exterior trim Shower stalls · Grilles, plaques, louvers · Revolving doors Cold-formed sections · Decorative trim

S

EEL

0-1189

AMERICAN STEEL & WIRE COMPANY, CLEVELAND : CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH · COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM · UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

STAINLESS

SHEETS . STRIP . PLATES . BARS . BILLETS . PIPE . TUBES . WIRE . SPECIAL SECTIONS

E



UNITED S

# WHY SHOULD AN INSULATION BE EASY TO APPLY ?

Insulation is only as good as its application. And correct application must be *continuous*—with no gaps, voids or differences in thickness . . . no opportunity for skimping.

With Balsam-Wool, ease of application is actually "built in"—a part of the product design. Balsam-Wool comes to the job as a completely finished product with uniform, factory-controlled thickness and density. It is clean and non-irritating — pleasant to work with. It is quickly and easily cut to proper length. Balsam-Wool's two spacer flanges assure a tight, foolproof fit and proper air spaces front and back. These tough flanges are nailed or stapled to the face of the studs, joists or rafters for lasting security. The ends are also sealed to plates or headers, providing continuous vapor barrier protection over the entire stud or joist space—no butt joints or openings at ends. No wonder Balsam-Wool provides *positive* protection!

- Integral continuous vapor barrier
- Sturdy wind barrier
- Double air spaces
- Special spacer flanges
- Double bonding of mat to liners
- Rot and termite treatment
- Highly fire retardant
- Rigid quality control

To bring you up-to-date authoritative information on application, the makers of Balsam-Wool have prepared 32 application data sheets . . . a little "library" of valuable data, contained in an A.I.A.A. folder. Send today for your set—it is yours for the asking. Just mail the coupon.



\*REG. U. S. PAT. OFF.

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Wood Conversion Company Dept. 147-70, First National Bank Bldg. St. Paul 1, Minnesota	
Please send me a set of Balsam-Wool Application Data	Sheets.
Name	
Address	
CityState	

#### PRODUCT NEWS

In conjunction with the analysis of contemporary store design on page 62, this month's Product News is devoted almost exclusively to material and equipment which are particularly useful in store construction.



An educated switchboard, the Rollocolor computes the different quantities of three colors and white needed to create various hues. On the automatic model (above) magnetic clutch drives operate the dimmers on each of the four circuits. On the manual device (right), one dimmer is used for white and a rotating commutator handles three colors.



Constant fire protection at minimum cost, combined with maximum daylight illumination, characterize Mississippi Wire Glass...the original solid wire glass upon which the Underwriter's Standard was based in 1899...the Standard today by which all others are judged.

For safer openings in corridor and room partitions, exterior walls, fire escapes and vertical shafts, specify the approved fire retardant that for over 50 years has been the choice of thousands of architects, engineers and builders everywhere.



ROLLED.

W YORK . CHICAGO . FULLERTON, CAL.

FIGURED AND WIRED GLASS

WORLD'S LARGEST MANUFACTURER OF

Send for Catalog No. 50

See Sweet's Architectural File

for further details. Samples

on request.



#### LIGHTING CONTROL enables four-circuit equipment to create 500 colors.

New manual and automatic models of the Rollocolor color lighting controller (FORUM, June '48) make this see-it-to-believe-it device adaptable to almost every store need and budget for display lighting. More than 500 different hues of colored and tinted light can be produced by means of four-circuit lighting equipment (cornice, or window strips, footlights, flood bunches, etc.) which is wired to the Rollocolor. Lights are fitted with four different glass filters (as monochromatic as possible) so that the four circuits correspond to red, blue, green and white light. These four sources are mixed (red and blue for lavender, red and green for yellow, etc.) by the Rollocolor to obtain 14 basic colors and all their perceptible intermediates. The glass filters never have to be changed; all blending is done by the controller. The 50 possible shades of white light alone make the device invaluable for putting merchandise in its best light. Even navy blue suits-the window dresser's despair-present very little problem.

A person relatively inexperienced in color and illumination can, with a few minutes' briefing, dial any color, establish the desired brightness without altering its hue, jot down the color's number indicated on the scale and at any time recreate the identical shade and intensity. While guesswork is eliminated, experimentation is facilitated. For unusual display effects, two or more colors may be used at the same time and, with the

automatic equipment, in sequence. By a slight adjustment, a single unit can predetermine the multiple colors and produce them simultaneously. As a particular hue is selected, the proper contrasting tint is established. Another feature of the automatic equip-



ment is that hue and brightness changes can be obtained instantly or gradually and can be preset at any desired speed. The operator can select his own time and color sequence of up to 20 different intervals and shades.

Prices for Rollocolor units range from \$400 for the small manual model, capable of handling 2,000 w. per color for the average store window display, up to \$4,100 for the fully automatic 13.5 kw. controller with 20 preset plugs. The spotlight pictured above sells for about \$100 complete with four lamps and filters.

Manufacturer: Color Lighting Corp., 100 Vanderbilt Ave., New York 17, N. Y.

(Continued on page 154)



# WHY IT PAYS TO STOCK-PILE

In any industrial operation there are times when additional buildings and plant alterations of a temporary or permanent nature are required. At such times a stock pile of Stran-Steel framing members pays off handsomely.

**MULTI-PURPOSE.** Stran-Steel framing can be used on any enclosed building or shelter-type structure such as garage, shed, warehouse, lean-to or canopy . . . also for permanent and movable incombustible partitions.

**NAILABLE.** All joists, studs, rafters and purlins have patented nailing groove, permitting the application of collateral material, inside and outside, with ordinary tools and nails.

**RE-USEABLE.** Framing members are of light, tough, high-quality steel . . . they are incombustible and virtually indestructible . . . can be used over and over. In storage they will not shrink or lose their usefulness.

**FAST ERECTION.** No special skill is required ... ordinary workmen using carpenters' tools can erect Stran-Steel framing swiftly, accurately and economically. The "in place" cost is usually less.

REGISTERED U.S. PATENT OFFICE



### The Ideal Framing

Stran-Steel framing is flexible for modern design, and its use results in buildings of great rigidity. The nailable feature provides speed of erection for application of all types of wall and ceiling finishes. In stock-pile storage there is no deterioration, no shrinkage, no loss.

GREAT LAKES STEEL CORPORATION STRAN-STEEL DIVISION · ECORSE, DETROIT 29, MICH. · UNIT OF NATIONAL STEEL CORPORATION



Others do... why not You :

Tillman Apartments, Memphis, Tennessee. The photo above is the Nu-Style Cabinet installation typical of 216 complete assemblies in this large project. Nu-Style Cabinets furnished by Carr-Adams Mfg. Co., Jonesboro, Arkansas, and Clark & Fay, Inc., Building Material Dealers. W. C. Lester was the Architect and the Contractor was the Tillman Co.

The Bilt-Well Line. Superior Unit Wood Windows . Exterior & Interior Doors • Entrances & Shutters · Clos-tite Casements · Carr-dor Garage Doors . Basement Unit Windows . Louvers & Gable Sash Breakfast Nooks 
Combination Doors . Screens & Storm Sash . Corner (China) Cabinets • Gli-dor Cabinets . Ironing Board Cabinets · Mantels & Telephone Cabinets . Multiple-Use & Linen Cabinets + Stair Parts.

WOOD

WOR

For the cabinet that is flexible, both to installation and use . . . specify Nu-Style Cabinets. Comparison proves Nu-Style Cabinets excel on all six points.

- 1. Exclusive Nu-Style door with "the Famous Profile"... in perfect harmony with latest ranges and refrigerators.
- 2. Nu-Style . . . strongest cabinet made . . . dovetailed drawers. Solid (3/4" thick) standards and mortised frame.
- 3. Nu-Style Cabinets can be scribed or sawn to join plastered surfaces.
- 4. Enamel any color or finish natural.
- 5. Produced by experts trained in latest scientific methods.
- 6. Made from thoroughly seasoned, kiln-dried Ponderosa Pine ... the best base for a wide variety of finishes.

Nu-Style Cabinets are sectional units in graduated sizes offering the utmost in flexibility of Color, Size and Layout.

Smooth Styling ... Easy to Install ... Fit any size or shape room ... Sturdy ... Rigid ... Dovetailed Drawers ... Extra Deep Drawers ... Simple to Decorate or Redecorate ... Can be finished any color or left natural.

CARR, ADAMS & COLLIER CO. Dubuque, Iowa

#### GOOD BRICKWORK = GOOD DESIGN + GOOD WORKMANSHIP + GOOD MATERIALS



#### GOOD WORKMANSHIP

Plenty of mortar should be thrown on the end of the brick to be placed. The brick should then be pushed into place, so that mortar oozes out of the head joint.



When dabs of mortar are spotted on the corners of the brick, the mortar does not completely fill the head joint, and voids are still left.

# FULL HEAD JOINTS, WITH BRIXMENT,

**HELP PREVENT** 

# LEAKY WALLS

WE SUGGEST THAT-

All head joints in both face brick and back-up work should be completely filled with mortar. If head joints are not completely filled, water may penetrate to the inside of the wall through openings in the joints. Dabs of mortar spotted on the corners of the brick are not nearly enough to fill the joints.

Take a look at the two examples shown at the left, and you'll instantly see why full head joints are an essential part of good workmanship in bricklaying.

No mortar material alone, not even Brixment, can make watertight masonry walls, so long as open crevices and pockets are left in the mortar joints.

Brixment mortar makes it far easier for the bricklayer to do good work. It is smooth and plastic — so soft and workable that the bricklayer can use enough mortar to fill the joint, and still "place" the brick easily and accurately to the line.

Brixment mortar has greater plasticity, higher water-retaining capacity and bonding quality, greater resistance to freezing and thawing, and freedom from efflorescence. Because of this *combination* of advantages, Brixment is the leading masonry cement on the market.

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

#### PRODUCT NEWS

#### BUSWAY DUCT WIRING feeds flexible and portable lighting systems.

Two prefabricated electrical distribution systems on the market can serve as the basis for highly adaptable lighting layouts where frequent changes are requisite. Trol-E-Duct and Feedrail, long utilized industrially to distribute current to portable tools, cranes, hoists, sewing machines, etc. are now also being used not only for factory illumination but for contemporary showroom and



# The NATIONAL Disposer





EVERY feature that's favored by contractors, plumbers and users is incorporated into the popular NATIONAL Disposer! National invites comparison with any other disposer.

Check these features when you compare other leaders...

★ FULLY AUTOMATIC ★ SAFETY TOP CONTROL ★ ONE-PIECE DRAIN

COVER

- ★ QUICK, EASY INSTALLATION ★ UNIT SMALL & COMPACT ★ WATER FLOW SWITCH ★ ROUGHS IN SMALL SPACE ★ POWERFUL, 1/3 H.P. MOTOR
- \* ONE PIECE, JAM-FREE
  - IMPELLER
- ★ UNIQUE SERVICE POLICY

#### YOU'LL DO BEST TO SPECIFY NATIONAL DISPOSERS

Nationals meet every requirement from the first planning stage on—every requirement of the architect, contractor, apartment and home owner. It will pay you to get complete details *now*. Get your "Architect's



cation sheets and installation data. Address: Dept. 6, Plumbing Equipment Division, National Rubber Machinery Company, Akron 8, Ohio.

File" including National Disposer specifi-



Made by National Rubber Machinery Company, for over 40 years designers and builders of precision processing machines.



Snapped into the duct where and when needed, spot and flood lights can be beamed in any direction.

store window lighting. In both systems, mobile outlets make contact with the enclosed copper bus bars to present a continous connection for electrical devices. When store displays call for addition or rearrangement of fixtures, these outlets or "trolleys" are snapped into a duct or removed easily by the layman—without new electrical work or power shut-offs. Other advantages of these wiring methods are their low initial cost and maintenance, simple installation, and complete salvability.

Feedrail "60" consists of an 18 gauge zinc plated steel enclosure with a slot at the bottom

and a heavy rib in the top. Cold rolled copper bus bars, capable of carrying 60 amp. (250 v. a.c. or d.c.) continuously without overheating, are mounted inside. Door sections are polarized to assure proper insertion of the trolleys. The track is made in 5 and



10 ft. lengths. The 10 ft. sections cost from \$30 for the one phase plain track to \$40 for the three



phase door track. Each weighs 20 lb. Non-fusible trolleys (15 amp.) range from \$5.50 to \$8. Trol-E-Duct "700" is made of electroplated

sheet steel in ten lengths, from 1 to 10 ft. Square slots in the duct ends engage interlocking clips in the coupling casing to join two sections together. Trol-E-Duct is rated at 50 amp., 250 v. On the fixture end of the system, General Lighting Corp. has adapted flood and spot lights to the Trol-E-Duct with special attachments. These units can be beamed in any



direction by means of a tension swivel joint, and are available in many models in gray-green, coral red, oyster-white, white and brushed aluminum. Single lamps fitted with Twist-Out (Continued on page 160)

# Designing a plant addition?

Unless you figure feeders in aluminum, you don't



There's no better way to save a client money than to figure plant wiring in both aluminum and copper before you specify. For equal current-carrying capacity, aluminum costs less.

iqure low

Insulated aluminum saves two ways: it is lower in price. And it can be installed faster because of its lighter weight.

For names of manufacturers, and a copy of "Questions and Answers about Insulated Aluminum Conductors", call your nearby Alcoa sales office. Or write ALUMINUM COMPANY OF AMERICA, 1778G Gulf Building, Pittsburgh 19, Pennsylvania.



Insulated Aluminum Conductors of ALCOA MALUMINUM are made by leading manufacturers



A total of 2200 Roddiscraft Solid-Core Flush Veneered Doors are in use at the United States Navy Medical Center in Bethesda, Maryland. Roddiscraft Solid-Core Flush Veneered Doors are included in the permanent equipment of the modern Mercy Hospital in Rockville Centre, New York. The new building of the Nassau Hospital, Mineola, New York, has Roddiscraft Solid-Core Flush Veneered Doors throughout.

# Roddiscraft

#### SOLID-CORE FLUSH VENEERED DOORS PROVED IN HOSPITAL SERVICE

5 reasons why it pays to include these quality doors in your hospital construction plans











Identification and Guarantee—All Roddiscraft Solid-Core Flush Veneered Doors are guaranteed without qualification as to workmanship and materials. Inserted in the hinge rail of every door is a red, white, and blue dowel which permanently identifies the door.

**Resistance to Abuse**—Roddiscraft Solid-Core Flush Veneered Doors easily withstand the punishment of heavy hospital duty. The entire door assembly is welded into a solid unit—permanently punctureproof, waterproof, and resistant to decay.

Standard Thickness Face Veneers— Roddiscraft Standard Construction is a feature which adds to the durability of these Flush Veneered Doors. The Roddiscraft method utilizes Standard Thickness Face Veneers—as opposed to <sup>1</sup>/<sub>8</sub>" and thicker veneers. Less moisture penetration — greater durability.

Sound Resistance—The high resistance of Roddiscraft solid-core construction to the passage of sound has been established by independently conducted laboratory tests. The standard 1<sup>3</sup>/<sub>4</sub>" Roddiscraft Solid-Core Flush Veneered Door develops an average sound transmission loss of 30.9 decibels.

Fire Resistance—One reason why Roddiscraft Solid-Core Flush Veneered Doors are ideal for hospitals is their exceptional resistance to fire. This fact has been established by independent laboratories, where standard Roddiscraft doors exceeded the 40-minute fire test. Both from the standpoint of utility and safety, Roddiscraft Solid-Core Flush Veneered Doors measure up to the stringent requirements of hospital planners. The service record of these exceptional doors stands as proof in itself. Every day—in new hospitals and old — Roddiscraft Solid-Core Flush Veneered Doors are providing dependable, satisfactory service. It's no wonder that more and more hospitals are turning to Roddiscraft for their doors.

Write for book —"An Open and Shut Case for the Finest Flush Doors" —giving complete details and specifications of the Roddiscraft Door line.



Cambridge, Mass. Charlotte, N. C. Chicago, III. Cincinnati, Ohio Dallas, Texas Detroit, Mich. Warehouses in Houston, Texas Kansas City, Kansas L. I. City, N. Y. Los Angeles, Calif. Louisville, Ky. Marshfield, Wis. Milwaukee, Wis.

New York, N. Y. Port Newark, N. J. Philadelphia, Pa. St. Louis, Mo. San Antonio, Texas San Francisco, Calif.



For low cost per year of service, you can't beat a copper roof like this one on the Northway Christian Church, Dallas, Texas. Architect: Tatum & Quade; General Contractor: Miller & Norton; Sheet Metal Contractor: Mustang Sheet Metal & Mfg. Co.; Revere Distributor: Moncrief-Lenoir Mfg. Co.-All of Dallas, Texas.

## Dollar for Dollar, There Is No Substitute for a



• Whenever you want lasting sheet metal construction, there is no substitute for copper. Because copper—beyond any other material commonly used for roofing, gutters and flashing—has proved its ability to give longer service per dollar of cost when properly designed and installed.

These statements are backed by facts and figures developed by intensive research and by case histories of wellknown buildings. No other sheet metal construction material can support so strong a claim.

To make certain of correct design and take advantage of proved installation techniques, it will pay you to use the new design and installation data developed by the Revere Research Laboratories. You'll find these data in Revere's book, "Copper and Common Sense," an authoritative manual of sheet copper construction that has been widely distributed to architects and sheet metal contractors. There is probably a copy in your files. Be sure to refer to it as your guide to finer and more durable sheet copper construction.

Revere sheet and roll copper and other Revere quality materials are available from leading distributors throughout the United States. A Revere Technical Adviser will always be glad to consult with you without obligation.



COPPER AND BRASS INCORPORATED Founded by Paul Revere in 1801 230 Park Avenue, New York 17, New York

Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.–Sales Offices in Principal Cities. Distributors Everywhere.

# All this crowd to see a house?

Yes, because it's one of those modern, new homes that attract people faster than sugar draws flies. And one of the big reasons is its Bryant automatic gas heating that's going to make it sell or rent *faster*, and for *more money*!

It's no secret to Mr. and Mrs. America that the Bryant nameplate means quality. In fact, you'll hear many a story of how the Bryant that Uncle Jim bought back in the early 1900's still is doing a fine job.

Today, Bryant offers the most reliable, most diversified gas heating equipment ever presented to help make your *houses* the kind of *homes* America wants.

There's a Bryant representative near you. Call him or mail the coupon. Let him aid with your heating problems . . . and tell Officer Clancy to stand by to handle the crowds when you open your Bryant-heated homes!



The most complete line of gas heating equipment in the nation

tor call on me, Name Company Address	~
Name	~
	~
tor call on me.	~
□ Send me the new booklet that tells the Bryant story. □ Have your distribu-	120
Bryant Heater, Dept. 224, 17825 St. Clair, Cleveland, Ohio.	a harden





Again, new Hood Asphalt Tile has been chosen, this time for the new Butternut School in North Olmstead, Ohio, and again this superior tile is the choice of the architect, the general contractor and the flooring contractor ... men who know better flooring!

And for good reason! New Hood Asphalt Tile is now available in a choice of 24 sparkling colors with directional marbleization that will meet the requirements of the most exacting decorative plan, above or below grade, and its square, precision-cut edges mean all-important savings on labor and installation costs. More and more every day, Hood is adding to its long list of new installations in which it has been the choice of those whose responsibility is to install longer lasting, more colorful and more economical flooring. Let this choice of those who know be *your* guide on your next job whether it be for remodeling or a new building program for schools, colleges, hospitals, buildings, homes... wherever *better* asphalt tile is needed. Your inquiry for further information will be handled promptly.

Be specific . . . specify HOOD ASPHALT TILE ASPHALT < B.F.Goodrich TWO GREAT NAMES TWO GREAT TILES Hood Rubber Ca RUBBER

#### **PRODUCT NEWS**



Plugs for direct insertion to the wiring duct range from \$9 to \$15.

Manufacturers: Trol-E-Duct—Bulldog Electric Products Co., Detroit 32, Mich. Feedrail—Feedrail Corp., 125 Barclay St., New York 7, N. Y. Fixtures—General Lighting Co., Inc. 1527 Charlotte St., New York 60, N. Y.

#### PROXIMITY SWITCH turns on window display lights as viewer approaches.

The Electro-Switch can work to attract attention or as a protective device. With its No. 40 wire

senser mounted across the *inside* face of a store window, the mechanism will trip a light switch as a passer-by comes within 3 ft, of the window. It is also effective through thin walls and



partitions. Besides serving as a switch for turning lights on and off or activating moving displays, the Electro-Switch may be utilized to open and close doors or signal an approach to a cash register or locked entrance. Price is \$65 and installation is simple. The device will handle up to 8 amp. output. For heavier loads, a relay box is used with the unit.

Manufacturer: Electronic Heat Treating Co., 1808 Fairview, Muskegon, Mich.

#### DISPLAY LAMPS with interchangeable parts offer adaptable lighting.

Swivelite fixtures are very useful in store installations where showcase and promotional displays demand constant refreshening, and conse-



quently, new focus lighting arrangements. Although the lamps come completely assembled to specifications, their parts can be interchanged, creating a flexible arrangement. Not only are the midget and standard torpedo aluminum hoods interchangeable, but when the porcelain casing of the swivel socket is removed, cluster canopies,

rigid or flexible pipes may be added to the unit. All components are satin finished aluminum. The basic design includes a double ball swivel which provides a complete 360°



horizontal adjustment and 170° vertical direc-(Continued on page 162)



## ... when you specify kno-draft adjustable air diffusers

Handsome is . . . the way Kno-Draft Adjustable Air Diffusers integrate with any decorative theme ... as soft contrasts in their natural aluminum or, as in the picture above, blended by painting to match the ceiling.

And handsome does . . . a superlatively efficient job of distributing the air to meet any desired pattern of flow . . . assuring equalized temperature and volume-without draft-throughout the conditioned area.

With Kno-Draft Air Diffusers, both air volume and direction can be adjusted and controlled after installation - an important feature. There are models and sizes for every need.

KNO-DRAFT DATA BOOK: Complete specifications, engineering and installation data on Kno-Draft Adjustable Air Diffusers. To get your copy, simply fill in and mail the coupon. No obligation, of course.



................ .

	W. B. CONNOR ENGINEERING CORP. Dept. D-70, 114 East 32nd Street, New York 16, N. Y.
W. B. CONNOR ENGINEERING CORP.	Please send me, without obligation, my copy of the Kno-Draft Air Diffuser Data Book.
114 East 32nd Street, New York 16, N. Y.	Name
Air Diffusion • Air Purification • Air Recovery	Position
In Canada: Douglas Engineering Co., Ltd., 190 Murray Street, Montreal 3, P. Q.	Company
	Street
	7

#### **PRODUCT NEWS**

tional focus. Fixtures may be flexed to any position by touch and will stay put without set screws or wing nuts. Louver clips, available with hood units, eliminate side spill of light and can be used with or without color filters. Ventilating ports carry excess heat away from lamp socket. Besides screw-in units and portable base lamps, the line includes curved arm canopy and hi-hat fixtures.

Manufacturer: Amplex Corp., Swivelite Division, 111 Water St., Brooklyn 1, N. Y.

merchandise

spoilage

stop





Deflector and suspension mechanism are concealed inside body of sprinkler so that only the fusible link projects below ceiling. When the fire detecting element fuses, the deflector plate drops,

# where it starts ... at THE ENTRANCE

Shut the door on excessive spoiled merchandise — but keep the door open for customers. There is only one door that is always open to customers, always closed against dirt and dust — a revolving door.

You will find International-Van Kannel revolving doors will greatly reduce the amount of merchandise spoilage by reducing the dirt that infiltrates into the store . . . helping to keep counters and floors free from dust and drafts.

Dirt in a store is a problem. The answer is — to keep it out use International-Van Kannel revolving doors.





WRITE TODAY FOR COMPLETE INFORMATION

There are 11 entrances built around International-Van Kannel revolving doors at the Higbee Company, in Cleveland.

The photograph above shows one entrance before modernization; the picture below is of the same entrance after two new International-Van Kannel revolving doors were installed.







Sprinklers in store ceiling are barely noticeable

#### SPRINKLER HEAD features jack-in-the-box construction.

The only visible portion of the Viking flush sprinkler head is its fusible link which projects 3/4 in. below the ceiling. When the head "goes off" however, the mechanism contained inside the sprinkler body drops down so that the deflector plate is 4 in. below the ceiling. It is claimed that the four chains suspending the deflector actually help achieve better water distribution. Having a fusing point of 160° this model, Underwriters' approved for ordinary hazard, is suitable for most store areas and particularly desirable because of its small size. Although the Viking flush sprinkler is priced about 10 per cent higher than ordinary sprinklers, these are such a small part of the system that total installation cost for new construction or remodeling is about the same. Manufacturer: Viking Corp., Hastings, Mich.

#### SPRINKLER HEAD with quick operating bulb extends I in. below ceiling.

Providing automatic fire protection in stores, restaurants, etc., Grinnell sprinklers are barely noticeable. Installed in a pendant position the



sprinklers themselves project 1 in. below the ceiling. Only the tiny quartzoid bulb and stainless steel deflector and its supporting arms are apparent. All piping is concealed above the

plaster or acoustical panels of the ceiling. The thin escutcheon plate, available in brushed or chrome finish, may be painted to blend with surrounding area. Tem-



perature at the ceiling need reach only 135° to burst the quartzoid bulb and release the water. Each deflector discharges a wide even spray over the floor and ceiling. The device is approved by Underwriters' Laboratories.

Manufacturer: Grinnell Co., Inc. 260 West Exchange St., Providence, R. I.

(Continued on page 168)

# A DISTINCTIVE, NEW SIDING MATERIAL FOR LOW-COST ARCHITECTURAL EXPRESSION

### THIS NEW VERSION OF WELDTEX\* PLYWOOD IS FINDING FAVOR WITH ARCHITECTS

Chances are you've used Weldtex panels before...with striking effect. Now this popular material is available in a new form...convenient, easy-handling size for exterior siding.

The deep striations give you all the beauty of the finest cedar shakes...plus a smooth, trim, modern line that gives beauty to your designs. In *one* material, you combine all the good points of shingles and clapboard ... and minimize the problems.

And look at the structural advantages.

Only 22 pieces cover a square. You get a 137/8" exposure and only a 2" lap. You have a minimum of seams, and those easily backed up.

With a combination like that, you can see why architects who have used it are enthusiastic about Weldtex Siding.

Fast application saves substantially in labor costs. Short laps and long exposure cut material requirements far below those of shingles. The easy, effective back-up for the few seams makes weather-proofing simple and certain.

Weldtex Siding is approved by F.H.A. on Federal Housing jobs.

Get complete information on this new siding material. It speeds, simplifies and improves construction... and adds beauty to any home. Write us today. We'll rush you full details.

#U.S. PAT. NOS. 2286068, 2363927, 2363492, TRADE MARK REG.

Detail 1 shows normal installation of Weldtex Siding. Detail 2 shows how simply and easily you can fair out the butt of the board to create a deeper shadow line, when desired. Weldtex Siding is 3-ply Exterior Grade Douglas Fir Plywood 3/8" thick. Panel size: 48" by 157/8".



### Weldwood WELDWOOD FLUSH DOORS Manufactured and distributed by

UNITED STATES PLYWOOD CORPORATION

New York 18, N. Y.

Branches in Principal Cities

Warehouses in Chief Trading Areas · Dealers Everywhere

## FOR LEAKPROOF, TROUBLE-FREE PIPE RUNS

Cut-a-way view of a Walseal Tee showing a factory inserted ring of silver brasing alloy, and completed Silbras joint.

## Specify Walseal\* Products

On all types of piping jobs where Type "B" copper or red brass pipe is used, trouble can be avoided by installing Silbraz\* joints – made with Walseal valves, fittings and flanges.

Threadless, patented Silbraz joints are silver brazed (not soft soldered) pipe joints that are leakproof, trouble-free — permanent ... connections that will not creep or pull apart; that literally join with the piping system to form a "one-piece pipe line". Thus, these modern joints eliminate the need for maintenance and costly repairs — especially important where lowered operating costs are imperative.

For complete details on the modern Silbraz joint, made with Walseal products, write for a copy of Walworth Circular 84.

Patented - Reg. U. S. Patent Office.

Make it a "one-piece pipe line" with WALSEAL WALWORTH valves and fittings 60 EAST 42nd STREET, NEW YORK 17, N. Y.

#### **Recommended** for

Hot and Cold Water Circulating Systems

**Boiler Feed Lines** 

**Steam Return Lines** 

**Condensate Lines** 

Low and High Pressure Air Systems

Lubricating Oil Circulating Systems

Industrial Gas Piping

Solvent and Vacuum Piping Systems

Look-Ahead Builder,

D. C. Burns

間1

THI

Every home in the great Brentwood Development comes equipped with a Bendix Washer

**BURNS REALTY FOUND A WAY TO** 

**MAKE BUYERS OUT OF LOOKERS!** 

Out Denver way, they do things up big. And this huge development by the Burns Realty Co., is a typical example. 1150 homes will be the total count by the end of this year. And every home will

ida i s

..

be equipped with a Bendix Washer! Why did Burns—along with so many other ''look-ahead builders''—choose Bendix? A woman wants convenience. A man wants value. They both get what they're looking for in a house that's equipped for modern living. And a Bendix is the very symbol of today's time-saving convenience.

Many, many builders have discovered that a Bendix home Laundry as part of their package is the "extra" that closes sales—even in the heat of today's keen competition. The Bendix builder story is a story worth looking into. Check up on it through your nearest Bendix distributor—or write us for his name.



Bendix is participating in the Good American Homes Program





BENDIX HOME APPLIANCES, INC.

SOUTH BEND 24, INDIANA

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The cost of heating takes a beating at Columbia Carpet MANY firms today are paying too much for heat, but not Columbia Carpet Mills, Inc., Philadelphia. Columbia has the cost of heating well under control with a Carrier installation. Circled here are some of the units that do the job.

These Carrier Horizontal Discharge Unit Heaters have a lot to recommend them. Their revolutionary single-row coil construction offers less air resistance, reduces power consumption, facilitates cleaning. Their adjustable discharge louvers provide control of the heat flow where it's needed, eliminate dead spots. Though light in weight, they're so ruggedly built they're right for heavy duty in factories and garages. And they're so handsome they're also ideal for quality stores and exclusive shops.

Economy of operation and long life are built into all Carrier Unit Heaters. Whatever the job, you and your clients can count on them for superior performance. The Carrier name is assurance of plus values. Carrier Corporation, Syracuse 1, New York.



Carrier 46U Horizontal Discharge Unit Heater. Sturdy and attractively styled. With steam or hot water. Capacities: 13,400 to 200,000 Btu's per hour.

Carrier 465 Four-way Directed-flo Unit Heater. For quick heat from relatively high ceiling suspension. With steam or hot water. Capacities: 49,000 to 500,000 Btu's per hour.

**Carrier 46T Gas-fired Unit Heater.** AGA approved. With LP gas, and manufactured, mixed and natural gases. Heart of Aluminized Steel for long life. Capacities: 70,000 to 230,000 Btu's per hour.

**Carrier 46PQR Heat Diffusers.** For heating large enclosed areas at low cost. With multiple outlets and adjustable louvers. Floor, wall or ceiling mounted. Capacities: up to 1,500,000 Btu's per hour.



Air Conditioning . Refrigeration . Industrial Heating

Here's the Heater for it!

What's the job?

# oak lasts a lifetime

Oak flooring gives home owners a lifetime of beauty and easy upkeep that can't be matched. There's no periodic replacement... no unsightly deterioration with oak. So it's only natural that 85% of all prospective home buyers prefer oak flooring.

This established preference also helps to sell. When prospects enter and see oak floors, they are then disposed to look favorably on the other attractive features of your design. And since there is a grade of oak for every style and price of house, it's easy to give all home buyers the oak flooring they prefer. *See our catalog in Sweet's.* 



Oak, the flooring that has everything everyone wants



oak\_for apartments







oak-for luxury homes



oak-for medium-priced homes

NATIONAL OAK FLOORING MANUFACTURERS' ASSOCIATION . Sterick Building . Memphis 3, Tennessee

#### **PRODUCT NEWS**

#### TROFFER LIGHTING FIXTURES AND SPOT-LIGHTS are easily installed.

Westinghouse's new troffer fluorescent fixtures may be attached directly to incandescent spotlights for an integrated lighting system. Their shallow construction requires only 7<sup>3</sup>/<sub>4</sub> in, above the finished ceiling; the fixtures are installed quite simply by attaching the housing to "U" bracket supports, and are leveled by four screws. The three types of shielding—louver, plain ribbed





Shielding glass or louvers are easily switched from one troffer to another.

glass and prismatic lens-are interchangeable. Each hinges to the housing and a sliding pin latch permits access to the lamps without tools. Housings are supplied in 4 ft, lengths in two and three lamp models at about \$28 and \$38. A two lamp 8 ft. unit sells for about \$61. The SR 150 companion swiveling incandescent spotlight, priced at \$20, is designed for use as a separate recessed unit or within rows or groups of the troffers. It utilizes a 150 w. projector lamp and is well shielded by a concentric ring louver. End plates (two are necessary for each individual fixture or continuous row) cost \$1.10 and \$1.60 each, depending on type of mounting used. Manufacturer: Westinghouse Electric Corp. Box 2099, Pittsburgh 30, Pa.

#### LIGHTING SYSTEM can be used in many curved and angular patterns.

Day-Brite Plexoline units may be installed individually or combined in a wide variety of lighting networks. Two basic units make up the line

—linear sections with two or four fluorescent lamps and circular incandescent units. With die-formed adapter fittings, the circular fixtures act as pivots for the linear sections to form almost any angle. The two types of circular units available are ad-



justable accent lamps and fixed units. Both are made in two sizes—15 in. diameter for use with two-light linear sections and 21 in. diameter for the four-light. Prices for these circular models range from \$15 to \$27.50. The linear sections



have ribbed glass side panels and may be either suspended or surface mounted. All the Plexoline fixtures are finished in white enamel. Instant starters are furnished for the fluorescent lamps.

Manufacturer: Day-Brite Lighting, Inc. 5411 Bulwer Ave., St. Louis 7, Mo.

(Continued on page 172)

# STANDARD OIL OF INDIANA CHOOSES AMBASSADOR DESIGN by LOCKWOOD!

Administration and Laboratory Building at Whiting, Indiana. Architects, Holabird, Root and Burgee.

Naturally enough perhaps, Ambassador Design, born of collaboration between Lockwood and Holabird, Root and Burgee for use on the Statler Hotel in Washington, D. C., was specified for this fine new plant in Whiting. An unusually attractive design, functional in treatment, Ambassador is attached by ingeniously concealed screws. It has now met every test of installation and service with flying colors and is a proud part of the Lockwood line.

The trend of architects to specify Lockwood as the standard of quality continues to grow in all parts of the country.

ockwood

See our Catalog in Sweet's File-Architectural.



HARDWARE MANUFACTURING COMPANY FITCHBURG • MASSACHUSETTS





#### FIFTY LOW-COST HOMES, like those pictured above on Orchard Heights Drive, Mayfield Heights, Ohio, were built last year; one hundred more are being built this year by Orchard Park Building Co., Morris Levitt, builder. Specified for all of them are A. O. Smith gas-fired, forced-circulation hot water boilers, for radiant panel installations.

## MORE RADIANT HEAT FOR SMALL HOMES! Ohio Builders Specify A. O. Smith Gas-Fired Boilers

• Pioneer in radiant heating in the Cleveland region is Daniel D. Passoff, president of The City Plumbing & Heating Co. In the housing developments pictured on this page, and others, Mr. Passoff's firm installed A. O. Smith Hot Water Boilers.

• Ideal for all types of forced-circulation hot water heating, the gas-fired A. O. Smith Boiler speeds hot water to all points, even in ranch-type homes, *in seconds*. No heavy cast-iron sections. "Water-wall" combustion chamber is copper tubing—plus a finned heat exchanger. Rust-free design permits water to touch nothing but copper, brass, bronze.

**SEND THE COUPON** for complete specifications of boilers illustrated, also A. O. Smith "package" boilers for homes of all sizes up to 12 rooms.



SMALL HOMES like this in the Mayfield Heights development enjoy the steadiness and cleanliness of modern radiant heat. Utility room shown at the right.



MAYFIELD, O., HOME, one of 15 built in 1949 on Worton Blvd. by Roberts Construction Co., Robert Kaplan, builder. Twenty more are going up this year. A. O. Smith Boilers, for radiant floor panel heating, supplied through The Baird-Foerst Corp., Cleveland, A. O. Smith distributors.

UTILITY ROOM installation includes both boiler and automatic gas water heater by A. O. Smith. Both are available for all kinds of gas, including LP. AGA-approved.



Boston 16 • Chicago 4 • Houston 2 • Los Angeles 14 Milwaukee 2 • New York 17 • Pittsburgh 19 • Salt Lake City 1 Seattle 1 • Washington 6, D.C. • International Division: Milwaukee 1





A. O. SMITH BOILER installation for home shown above. Patented A. O. Smith Modulating Burner adjusts gas consumption to varying demands, minimizes stand-by losses.

A. O. Smith Corporation Dept. AF-750, Toledo 7, Ohio Send us complete specifications on A. O. Smith Gas-fired Hot Water Boilers.

Name\_\_\_\_\_ Firm\_\_\_\_\_ Street\_\_\_\_\_ City\_\_\_\_\_State\_\_\_\_



this man offers you ...

Expert assistance in the selection and application of the right acoustical product for every Sound Conditioning job. He is your local distributor of Acousti-Celotex products-the nation's most complete, quality line of acoustical materials.

His Sound Conditioning skills reflect over 25 years of experience and hundreds of thousands of installations. His acoustical products have been tested and proved to meet every building code, specification and requirement.

For custom-made installations of lasting beauty and quiet, make sure to contact the man with the most widely used acoustical products ever developed, plus the most extensive experience in Sound Conditioning.



#### ACOUSTI-CELOTEX CANE FIBRE TILE

A lightweight, rigid unit, combining

unit, combining acoustical efficiency with a durable, smooth surface. Perforations (to within ½" of the back) assure repeated paintability and ease of maintenance. Available in a variety of sound-absorbent ratings. Rot proof and ver-min proof (patented Ferox process).

#### ACOUSTI-CELOTEX MINERAL TILE

Midde of mineral fibre, felted with a binder to form a rigid tile with a uni-versal rating of incombustibility. Perforated with small holes extending almost to the back of the tile, high acoustical absorption is pro-vided together with unrestricted paintability by either brush or spray method.

#### ACOUSTI-CELOTEX\* FLAME-RESISTANT SURFACED TILE

A cane fibre tile with a flame-resistant surface. This tile meets Slow Burning



meets Slow Burning rating contained in Federal Specifica-tions SS-A-118a. It may be washed with any commonly used solution satisfactory for good quality oil-base paint finishes without im-pairing its flame-resistant surface character-istics and without loss of sound-absorbing capacity. Repainting with Duo -Tex flame-retarding paint will maintain peak efficiency. Supplied in all sizes and thicknesses of reg-ular cane tile. ular cane tile.

#### ACOUSTI-CELOTEX **FISSURETONE**\*

A totally new min-eral fibre acoustical tile. Attractively styled to simulate travertine, it beautifies any interior and effec-tively controls sound reverberation. Light-weight, rigid and incombustible, it is factory-finished in a soft, flat white of high light-re-flection rating. flection rating.

ACOUSTEEL\* Combines a face of perforated steel



perforated steel with a rigid pad of sound absorbing Rock Wool to pro-vide excellent sound absorption, together with attractive appearance, durability and incom-bustibility. The exposed surface of perforated steel is finished in baked-on enamel. Acous-teel is paintable, washable, cleanable.

\*Trade Marks Reg. U. S. Pat. Of.

The Celotex Corporation, Dept. A-7, 120 S. LaSalle St., Chicago 3, Ill. • Dominion Sound Equipments, Ltd., Montreal, Quebec, Canada



Look Outside! Look Inside!



Architects and builders agree that it pays to choose Frigidaire ... because *Frigidaire makes a good building better*. And the makers of America's No. 1 Refrigerator – makers of over 12 million refrigerating units – stand firmly back of that statement.



# You can't match a FRIGIDAIRE Apartment-Size Refrigerator!

Cut refrigerating maintenance costs by specifying refrigerators that can be depended on year in, year out, to give economical, trouble-free service. Frigidaire's Standard Model SM-60 (illustrated) has been designed to meet the particular demands of apartment and small-home kitchens. It requires little more than 4 sq. ft. of floor space, is 51<sup>7</sup>/<sub>8</sub>" high, yet has a full 6 cu. ft. of storage capacity, 11.7 sq. ft. of shelf space and stores 16 lbs. of frozen foods.

Genuine Frigidaire quality features include new, streamlined Raymond Loewy styling-colder-thanever Super-Freezer-acid-resisting Lifetime Porcelain in Hydrator and food compartment-glass Cold Storage Tray.

See your Frigidaire Dealer for proof that you can't match Frigidaire products for apartment kitchens and laundries. Look for his name in Classified Phone Directory. Or write Frigidaire Division of General Motors, Dayton 1, Ohio. In Canada, Leaside 12, Ontario.

FRIGIDAIRE 🐲 America's No. 1 Refrigerator



Money-saving Meter-Miser... simplest cold-maker ever built. Oiled for life, sealed in steel, it is amazingly economical, compact, trouble-free.



Acid-resisting Porcelain Hydrator ... keeps fruit and vegetables fresh. Slides easily, even when loaded. Plastic cover serves as extra shelf.



**Double-Easy Quickube Ice Trays...** slide out instantly and release cubes quickly with finger-touch ease — two or a trayful. All-aluminum construction.

#### Ask for facts on these other Apartment Products by Frigidaire

Complete quick facts about the compact, low-cost Frigidaire products shown below are yours for the asking. Get in touch with your Frigidaire Dealer.

#### Model AM-43 Refrigerator

4.3 cu. ft. capacityshelf area, 8 sq. ft. Ideal for Pullman-type apartment kitchens.



Model RK-3 Electric Range 21 inches wide — yet has all basic cooking

Model RM-30 Electric Range

facilities.

Has new Thrifty Giant oven, yet is only 30 inches wide.



30-to 80-gallon capacity. Round and tabletop models.

Frigidaire Kitchen Cabinets

Variety of types and sizes. Individual units -yet they give kitchens a custom - built look.

#### Frigidaire Kitchen Sinks

Single and double sink styles. Plenty of organized storage space.

Frigidaire Electric Dehumidifier

Removes moisture from air automatically. Dozens of uses. Powered by Meter-Miser.



Has exclusive Live-Water Action. Frigidaire Ironer and Electric Clothes Dryer are also available.





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#### AIR CONDITIONING METHOD uses hygienic liquid absorbent to remove excess moisture.

With a number of successful industrial installations to its credit, the Niagara Controlled Humidity Method should interest store designers because of its reported low air conditioning operating costs and comfortable humidity conditions. Initial cost of this system (complete with air cooler) for a department store would run about the same as a conventional air conditioning system. For the smaller store with a 20 to 25 ton air conditioning load, its cost would run about 25 per cent higher, except where  $60^{\circ}$  well water might be available. In this case, the Niagara system could be used without refrigeration equipment to maintain a comfortable  $80^{\circ}$  indoor temperature with a relative humidity of 50 per cent, even when outside temperatures soared to  $90^{\circ}$ .

The Niagara Controlled Humidity Method uses Hygrol absorbent solution to bring the humidity of fresh outside air down to 25 per cent



before it enters the refrigeration system. Freed of the dehumidifying job, the refrigeration plant has only to reduce the temperature of this fresh air and the air to be recirculated through the store. The more fresh outside air to be taken into the system, or the more moisture to be removed from the air, the more advantageous the Niagara system.

In comparing the operating costs of the Niagara system with a conventional air conditioning setup, the manufacturer's figures show a 40 ton savings in the refrigeration load in the former's favor. These figures are based on a 95° outside dry bulb temperature with 40 per cent relative humidity, a desired inside temperature of 80° with a 50 per cent relative humidity, and a 25 per cent fresh air intake with 1,000,000 btu's per hr., sensible heat load. To meet these conditions with a conventional air conditioning system, the refrigeration and dehumidification would impose a 132 ton refrigeration load on the compressors. The Niagara system, by removing the dehumidification load from the refrigeration compressors. is said to meet the same temperature conditions and at the same time have total heat load of only



92 tons on the compressors. The diagram above illustrates the Niagara process. Fresh air enters the conditioner and passes through the Hygrol absorbent spray. (Cooling coils in this compartment are connected to same cooling tower as the refrigeration system.) All but 25 per cent of the moisture is taken from the air before it is mixed with recirculated air, and flows to the sensible heat cooler. The mixed air is then cooled and transmitted to the outlets. Meanwhile, constantly diluted by absorbing moisture from the air, the Hygrol liquid is pumped to a concentrator where it is heated and reconcentrated automatically as the moisture evaporates into the air. The air is then cooled to condense any Hygrol vapors in it and thus prevent appreciable loss of the liquid from the system. In addition to its absorbing qualities, the Hygrol does a good job of cleaning the air. Niagara units are manufactured in sizes from 1,000 to 24,000 CFM.

Manufacturer: Niagara Blower Co., 405 Lexington Ave., New York 17, N. Y.

#### HYDRAULIC DOOR CLOSER is gear operated.

A concealed hydraulic closer for wood and metal doors, this Norton development is said to be the first completely geared mechanism of its kind to be manufactured. No links or chains are used in (Continued on page 178)



# 50,000 different patterns possible-20% more light

It's amazing! With just 4 simple, low cost "building blocks of light", MITCHELL MODULE offers *unlimited* custom-fitting lighting patterns to fit any commercial interior. MODULE's exclusive plastic louver passes 20% MORE LIGHT. Simple fitting together of units (mechanically and electrically) permits low cost rearrangement of patterns at any time to suit changing needs. MODULE mixes all light sources smoothly in one harmonious, handsome system—puts the light exactly where it's needed. No ordinary fixtures can match MODULE—the only lighting that custom-fits with standard low-cost units.

#### Only MITCHELL makes MODULE

There's nothing in lighting like MODULE. It custom-fits and "grows" with every lighting need; it delivers more light; it stays beautiful, new; it costs no more than ordinary fixtures. If you haven't all the MODULE facts, write today.

**MITCHELL MANUFACTURING COMPANY** 

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YOU SELL module INSTALLATIONS WHEN YOU TELL THIS SELLING STORY

How to save money for your clients on

# **ROOFING** and **SHEET METAL WORK**

This chart is designed as a time-saver for you, a money-saver for your clients. You can determine at a glance the suggested gauges of Monel<sup>®</sup> Roofing Sheet for principal sheet metal building applications.

THICKNESS IN INCHES THICKNESS IN INCHES U.S.S. GAUGE APPLICATION APPLICATION U.S.S. GAUGE Valley Flashings With Wood or Asphalt Shingles With Slate or Tile Flat Seam Roofing 25 .021" Standing Seam Roofing Pans (20" Wide)<sup>1</sup> (24" Wide)<sup>1</sup> .018" 26 .018" .021" .018" .025" 26 Roofing 24 .025" Valleys 26 24 Expansion Joints Exterior Walls Roof Curbs 'V' Cover and Floors Eaves .018" .021" .018" Batten Seam Roofing Pans (20" Wide)<sup>1</sup> (24" Wide)<sup>1</sup> 26 25 26 26 24 .018' .021″ Cover Strips Eaves Flashings 26 .018" .018" Valleys .025" Louvers (Stationary)\* Eaves rvers (Stations) Frame Covering Louver Slats (under 6 ft.) (over 6 ft.) .018 " min. .021 " min. .025 " min. .025 " min. Cleats 26 018 26 25 24 24 1 Indicates width of Sheets not width of Pans. Thru Wall Flashings? Flashings **Gravel** Stops .021" 25 24 .018" Stops Edge Strips 26 Coping Cover Edge Strips on Wood Copings Edge Strips on Stone Counter, Base and Cap Flashings Counter Flashings .018" 26 .025" Cap Flashings Base, over 10" width Base, 10" and under 24 .018" 26 25 Copings Standing Seam Flat Sheet Coping 22 26 25 26 .018" .018" .021" Gutters<sup>3</sup> Gutter Linings 36" Girth and smaller 36" to 48" Girth 48" Girth and larger **Cornices and Belt Courses** .021 <sup>#</sup> min. .025<sup>#</sup> min. .031<sup>#</sup> min. 25 Edge Strip on Wood Cornices Edge Strip on Stone 24 025 24 Cornices Belt Courses Flat Covering 22 22 25 25 26 26 .021" .018" .018" .031" .031" Molded Gutters Hung Gutters Gutter Expansion Joints <sup>4</sup> Gauges recommended are minimum and heavier gauges might be indicated depending upon design, number of structural supports and method of joining called for. <sup>2</sup> A patented, interlocking thru-woll flashing is available from Keystone Flashing Co., Philadelphia, Pa. <sup>3</sup> Thicknesses suggested are minimum and heavier gauges may be indi-cated depending upon design and proposed method of installation. Skylights Caps Condensation Gutter 25 26 .021" (NOTE: For replacement work where expansion joints and downspouts are more than 40 feet apart, 22 ga. (.031") Monel should be considered.) Sidings (Bulkheads—Elevator, Penthouse and Staircase Shafts) Flat Sheets Crimped, Keyed and/ or Corrugated Leaders 26 26 26 Downspouts .018" .021\* .018" Heads .018' Straps 26

These gauges, you'll note, are somewhat lighter than you might ordinarily specify. But service records prove that relatively light gauge Monel can safely be used—even under such severe conditions as are often found in many coastal cities and industrial areas.

Among the important reasons for this are the high corrosion-resistance and mechanical properties of Monel. This dependable Nickel Alloy withstands attack by smoke, rain and chemical fumes. It endures heat and cold with less buckling and no cracking. It has the strength to stand snow, ice and tearing winds. It takes years of flexing without showing signs of fatigue.

Keep Monel in mind — not only for entire roofs — but also for drainage systems, flashings, ventilators, louvers, skylight frames, siding, expansion joints, coping, gutters and downspouts. Its initial cost is low, its maintenance expense negligible.

#### When you need help

On request, The International Nickel Company will send you detailed infor-

MONEL... for the life of the building

mation on the use of Monel Roofing Sheet. There is no charge or obligation for this service. If you want samples of Monel Roofing Sheet, or profusely illustrated booklets for your clients, you need only ask for them.

\*

The particularly useful bulletin, Monel Roofing Sheet — Basic Application Data, from which the above chart was adapted, contains a full review of the properties and characteristics of Monel, a discussion of installation procedures, and a sample specification wording. A copy deserves a place in your file. May we send it to you?

THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street, New York 5, N.Y.

Keep this chart for ready reference



Edward Everett Elementary School. Giffels & Vallet, Inc., L. Rosetti, Associated Engineers and Architects; C. H. Reisdorf, Inc., General Contractors; W. Wilbur White, Plumbing Contractor; and T. W. Andrew Company, Kohler Distributor.

THE Edward Everett Elementary School, Detroit, Michigan, embodies the latest developments in structural design, lighting and equipment. As in many recently completed educational buildings, Kohler plumbing fixtures and fittings were used throughout.

It is estimated that one billion dollars will be spent in building new schools and remodeling present ones during 1950. Plumbing fixtures will receive careful consideration because they contribute to health and cleanliness. Kohler lavatories, drinking fountains, water closets, urinals and other fixtures are a sound investment in efficient sanitation and low-cost maintenance. They have earned the approval of administrators, architects and engineers for long, satisfactory school service.

Send for our latest catalog, showing a complete line of Kohler fixtures and fittings especially designed for schools and other institutions. Kohler Co., Dept. 15-P, Kohler, Wis. Established 1873.





Washroom showing Kohler (K-1950) Greenwich Vitreous China Lavatories with self-closing faucets.



Corridor showing Kohler Daybrook Drinking Fountains. (K-5335-A).
# TIPPLES ARE TOUGH



Over 170,700 sq. feet of Alcoa Aluminum Sheet cover the tipple, conveyor belt housing and other buildings at Stonega Coke and Coal Company's Glenbrook Mine.

Twenty-four years of coal dust and smoke have not harmed this unpainted Alcoa Industrial Building Sheet covering tipple and conveyors of Philadelphia Reading Coal & Iron Co.

(CO)FIRST IN ALUMINUM



Supports 80 p.s.f. uniform load with 4 foot purlin spacing. Weighs only 56 lbs. per hundred square feet. Available in 5 to 12 foot lengths, with all flashing and fastening accessories, from conveniently located distributors. For details and prices, call your Alcoa Sales Office.

# PROVING GROUNDS



### Twenty-four years of corrosive coal dust have not harmed Alcoa Building Sheet

In the damp, corrosive, dust and smoke-laden air of a coal tipple, metal roofing and siding meets one of its severest tests. Under these conditions, for twenty-four years and more, unpainted Alcoa Aluminum Building Sheet has performed perfectly and still is on the job.

No other material so well combines low first cost, ease of erection, freedom from maintenance, long life and good appearance. You can speed construction, eliminate painting costs, be sure of corrosion resistance when you plan industrial buildings using Alcoa Building Sheet.

Conveniently located distributors supply Alcoa Industrial Building Sheet in all standard sizes with accessories and fasteners. For complete details, design and fastening methods, ask your nearby Alcoa sales office for the booklet, "Alcoa Industrial Building Sheet", or write ALUMINUM COMPANY OF AMERICA, 1887G Gulf Building, Pittsburgh 19, Penna.



### Walls That Harmonize with the Architecture DI-LON Wallpaper Extraordinary

is a boon to architects and decorators who have been limited in effects obtained by ordinary wallpaper. DI-LON offers absolutely authentic reproductions of beautiful wood grains, interesting marbles, warm rich leathers and other unusual subjects. DI-LON Wallpaper is practical, economical, sunfast and washable.

> DI-LON WALLPAPER FOR HOMES, OFFICES, INSTITUTIONS AND INDUSTRIAL PLANTS.

Write for samples, descriptive literature and name of nearest dealer.



1700 London Road • Cleveland 12, Ohio

DI·NOC

### **PRODUCT NEWS**

the closer which incorporates a double piston and provides a back check to prevent doors from hitting the wall at 90°. The apparatus employs one shaft that runs through the center of a coil to which is attached a ratchet and a gear that



moves in two oil impregnated self lubricating bronze bearings. Power is supplied directly through the gearing, eliminating lost motion and giving constant control of the door from a 180° opening to latch position. The new closer may be interchanged on the job for righthand or lefthand doors. Prices for various single acting models with concealed arms range from \$54 to \$77. *Manufacturer:* Norton Door Closer Co., 2900-2918 N. Western Ave., Chicago 18, Ill.

#### TAMPERPROOF TIME LOCKS record exact time dorrs are opened and shut.

For peace of mind and better insurance coverage, the store owner would do well to consider time lock protection. Two

time recorder lock companies offering nationwide service are the Silent Watchman Corp. and Phelps Time Recording Lock Corp. Each charges about \$25 for installation and a monthly rental fee of \$3.50. In return, the store executive receives an accurate weekly account of just what time the door is



opened and closed by key. The regular door bolting device cannot be opened or closed without first unlocking or locking the time lock. By recording every entry and departure the time lock



provides the proof of forcible entry required in open stock burglary policies. Both firms have devised ways of fitting the locks inconspicuously on (Continued on page 184)

# THE THORO SYSTEM









The above is a candid sectional view of 150-individual-apartment building project, Prospect Park, Pittsburgh, Pennsylvania.

All interior surfaces of exterior masonry walls sealed with VaBar Plaster Bond.



All interior surfaces of exterior walls, to be plastered, shall be thoroughly cleaned, making sure that all excess mortar, projecting from wall surface, has been removed and repointing done by mason contractor, where necessary.

After thorough preparation of surface, heavy brush coat of VaBar Plaster Bond shall be applied over all surfaces to be plastered, minimum of 3 % VaBar Plaster Bond per square yard or sufficient material used to completely fill and seal the surface.

As application proceeds, surface shall be roughened by sweeping in vertical and horizontal sweeps, with regular house broom.

Curing period of several days is recommended.

Mixing and application of VaBar shall be in accordance with printed specifications, furnished by manufacturer.



Write for our 20 page brochure, pictorially describing masonry problems, and specification writer's

Standard Dry Wall Products BOX X NEW EAGLE PENNA

wall chart.

## **BUILDER CUTS COSTS \$263** with Thermopane WINDOW WALL



Construction time saved. Vertical 2 x 6's double as structural members and as side frames for the *Thermopane*. Horizontal 2 x 6's serve as top and bottom frame members, the fixed *Thermopane* being stopped into place. Ventilating sections are simple, top-hinged sash also glazed with *Thermopane*.

A house with extra sales appeal . . . built faster ... for less money. That's what builder N. P. Ninneman of Harrisburg, Pa., reports on his unique method of framing Thermopane\* insulating glass in window walls.

Mr. Ninneman figures his Thermopane window wall not only costs less than conventional wall construction, but also saves 20 or more days in construction time.

These benefits are made possible by using structural members of the house as frames to hold standard size Thermopane units. This window wall construction goes up so quickly that the house is completely closed in and glazed by the end of the fifth day, so inside work can proceed.

By using window walls, Mr. Ninneman is able to provide a spacious-looking home on a small floor plan. By glazing them with Thermopane, Mr. Ninneman assures buyers of comfort they wouldn't have with single-glazed window walls.

Case after case is being reported of builders who are adding the sales appeal of Thermopane window walls at little or no extra cost. Have you recently measured its possibilities for your houses?

FOR BETTER VISION SPECIFY THERMOPANE MADE WITH POLISHED PLATE GLASS



ndermetic Seal\*

(Metal-to-Glass)

Two Panes of Glass



LIBBEY · OWENS · FORD GLASS COMPANY MADE ONLY BY 3775 Nicholas Building, Toledo 3, Ohio

a.



## Effective uses of

**MAGNIFICENT** 18-story, 1100-room Sham-rock Hotel of Houston, Texas, is an archi-tectural triumph. Here, Pittsburgh Products contributed importantly. For in its con-struction were used 11,000 panes of Pennvernon, the quality window glass; forty-four Herculite doors; 6,000 square feet of clear Polished Plate Glass for the exterior of the first floor; large quantities of Plate Glass for vanity and furniture tops; approximately 10,000 square feet of quality mirrors on vanities and doors, Alumilited Pittco De Luxe store front metal, and 1,550 gallons of Pittsburgh Wallhide and Waterspar paints. Architect: Wyatt C. Hedrick, Houston, Tex.

**PROFIT-WISE** merchants insist upon "open vision" store fronts. They know that is the way to show off their merchandise to the best advantage. This showroom in Sherman Oaks, California, is a representative example of how a large expanse of Pittsburgh Polished Plate Glass can help the architect achieve a design of distinction – eye-catching and sales-winning. Architects: Conklin & Cole-man, North Hollywood, Calif.



## in contemporary architecture







formation. On the other hand, the Twindow unit, installed at left, is clear, without condensation. Shortly after this picture was taken, a second Twindow unit was used to replace the single-pane window. Architect: H. S. Starin, Duluth, Minn.

THIS CUTAWAY shows the construction of a Twindow unit with two panes of Pittsburgh Plate Glass. The hermetically-sealed air space between the panes provides effective insulation which minimizes downdrafts, cuts heat losses through windows, reduces condensation. Insulation is even more efficient when three or more panes are used. There are forty-five standard sizes available, adaptable either for wood or steel sash.

**HOME INTERIORS** assume greater charm, when you design them with large expanses of Plate Glass structural mirrors. Around the fireplace in the living room, as shown here, is a popular application. Why not give your homes the magic of mirrors? Pittsburgh mirrors are available in clear plate, blue, green or flesh tint, with gold, silver or gunmetal backing. Photographed at the Manor House, New York.

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BURGH

Your Sweet's Catalog File contains a complete listing and descriptions of Pittsburgh Plate Glass Company products. PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS

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### **16 Billion Cubic Feet** of "BAKER ICE"

These are cold facts. The combined output of BAKER compressors and condensing units since 1905, shown as ice, would cover a large part of New York City! If anything, larger than shown - for many BAKER machines have been running for a quarter of a century and longer.

You'll find BAKER equipment in air conditioning systems in hotels, theatres, restaurants . . . in refrigeration, freezing the ice at the skating rink at Sun Valley, quickfreezing the strawberry crop in Tennessee, preserving apples in Oregon and New England, oranges in California, fish in the Pacific ...

Refrigeration Engineers know BAKER as the quality line, and recommend it for long, faithful performance. BAKER offers full equipment in Freon and Ammonia for all types of custom-built air conditioning and refrigeration; and modern self-contained "packaged" air conditioners.

#### W.

The Baker Architects' and Engineers' Manual is a complete file of information covering Baker Equipment for all forms of Commercial Refrigeration and Air Conditioning. It con-tains data, tables, specification sheets and case histories. Baker Authorized Distributors to assist in the technical phases of specifica-tion work. Ask for it on your letterhead. Address BAKER REFRIGERATION COR-PORATION, South Windham, Maine.



### **PRODUCT NEWS**

glass as well as other types of doors. Either lock may be used horizontally on top or bottom rails of glass doors. Phelps suggests however, that for more positive double door protection, both doors be secured together by placing the time lock behind an escutcheon plate-an item not usually specified on glass door orders. For vertical mount-

ing, Phelps has developed a smaller lock, 61/4 in. long, 31/8 in. wide and 21/2 in. deep. This model, 21/4 in. shorter than the standard lock, requires no drilling for key cylinder because it utilizes the



TIMAT

regular lock on bottom rail. The Silent Watchman measures 81/2 in. x 4 in. x 3 in. and has a jeweled clock movement.

Manufacturers: Silent Watchman Corp., 505 W. 42 St., New York 18, N. Y. Phelps Time Recording Lock Corp., 227 Fulton St., New York 7, N.Y.

#### AUTOMATIC DOOR OPENER may be used on store fronts set flush with sidewalk.

Production is starting on a double acting power hinge which needs no posts or electric eye traffic channels and does not require much space, many major structural changes, or air compressors. Operated in both directions by electric hydraulic action, the Pittcomatic may be entirely self-contained in a checking floor hinge unit about as big as a shoe box or may be controlled remotely. It regulates in and out traffic through 250 lb. doors smoothly and efficiently and may be installed with complete safety to pedestrians on an entrance having a single door. The lightest touch or forearm pressure from the packageladen shopper is all that is needed to open a

heavy glass door fitted with this apparatus. Nicknamed "the invisible doorman," the Pittcomatic incorporates a small 10 v. switch hidden in the door handle, which starts the hydraulic movement the moment the door is touched. Power



is supplied by a piston rising  $\frac{1}{2}$  in, in a hydraulic cylinder. Through a cam action this vertical movement is translated into a turning one. As the piston rises, it compresses springs which force it down to close the door after the opening process. A 1/3 h.p. motor completes the equipment. Because the door works first by hydraulic action, the user, passer-by and the door are all protected against a violent swing. If the door should meet an obstacle while opening, a relief valve allows oil to by-pass the hinge. A moderate pressure will stop the door and if partially closed before the next pedestrian starts through, it will reopen as soon as the push bar is touched. The compact control panel provides an unlimited range of speeds and operational variations to meet the needs of specific installations. For instance, the door may be adjusted so that it will

(Continued on page 190)



Private Telephones for Home and Office . . . Hospital Signaling Systems . . . Apartment House Telephones and Mailboxes . . . . Fire Alarm Systems for Industrial Plants and Public Public Publics and Public Buildings.

No. Quincy 71, Mass.

Dept. 307



THERMOSTATIC SHOWER MIXERS **Give SAFEST Control Obtainable** 



 Proof obtained from tests described at left will show that no other thermostatic or pressure actuated shower mixer provides the greater safety insured by a Powers Type H Mixer.

In 1923 POWERS pioneered with the first pressure actuated type mixer which has been obsoleted by our far superior Type H Thermostatic Mixer. Its powerful quick acting thermostatic motor gives the most accurate control obtainable regardless of pressure or temperature changes in water supply lines.

When only one shower accident may cost many times more than POWERS mixers, why risk being "half-safe" with less than the safest mixer made?

(TH)

THE POWERS REGULATOR CO. OFFICES IN OVER 50 CITIES . SEE YOUR PHONE BOOK Over 58 Years of Water Temperature Control

CHICAGO 14, ILL., 2720 Greenview Ave. . NEW YORK 17, N.Y., 231 E. 46 St. LOS ANGELES 5, CAL., 1808 W. 8th St. . TORONTO, ONT., 195 Spadina Ave.

ONLY ONE MOVING PART - Powerful thermostatic motor assembly is easily accessible from the front. Simple and durable construction insures long life and minimum of maintenance.

### STANDARD TESTS

Federal Government Specifications (WW-P-541a) require that thermostatic water mixing valves be tested under conditions specified below:

> **Pressure Changes in Hot and Cold Water Supplies** 50% Increase in pressure 50% Decrease in pressure Failure of Cold or Hot Water Supply

**Temperature Rise in Hot Water Supply** 100° rise in temperature of hot water supply from 125 to 225°F

If You Test

Various Water Mixing Valves by the above conditions . . . you will find that **POWERS Type H** THERMOSTATIC WATER MIXERS Will Out-perform **All Other Mixers** 

Note that Government test specifications include TEMPERATURE rise. Pressure actuated mixers do not safeguard shower users against this danger.

#### **"The BEST Showers**



are regulated by POWERS"

# 5 New Models! Delco-Heat Announces a Brilliantly Engineered Line of New Gas-Fired Conditionairs



AGA-approved for all gases, including LP and LP-air. Also for bigb-altitude installations.

#### "GA" Series Gas-Fired Conditionairs

	DIMENSIONS		BLOWER		AGA APPROVED RATINGS BTU's PER HOUR (in Thousands)						
Model*	Ht	Ht. Width	Depth In,	RPM	CFM Max.	Nat., Mfg., Mixed Gas		LP-Air Gas		LP-Gas	
						In- put	Out- put	In- put	Out- put	In- put	Out- put
GA 63	56	22	26	550	550	62.5	50	62.5	50	60	48
GA 90	56	22	26	650	800	90	72	90	72	90	72
GA 120	56	281/2	26	660	1050	120	96	120	96	102	96
GA 150	56	35	26	620	1300	150	120	120	120	150	120
GA 120	56	48	26	600	1600	210	168	210	168	210	168

\*Available with either 12 or 16 gauge heat exchanger.



### **Products of General Motors!**

Here is a new line of gas-fired forced warm air furnaces that will add sales appeal and make your new homes easier to sell! Because for features, for value and for appearance—the new Delco-Heat "GA" Conditionairs challenge all competition !

The new "GA" Series includes 5 AGA-approved, forced warm air models—in both 12 and 16 gauge steel. Capacities are 62,500, 90,000, 120,000, 150,000, and 210,000 Btu input . . . a range that makes them applicable for all sizes of homes.

Note that the new "GA" Conditionair has extreme eyeappeal. It's compact, streamlined, and tastefully finished in Delco-green. Nothing protrudes—even the draft hood is concealed beneath the louvered panel.

Outstanding features of the "GA" Conditionair include the exclusive Multi-Rad heat exchanger—ribbon-type twin

burners — and a blowerfilter unit that is powered by Delco's famous *Rigidframe* motor.



Ribbon-type twin burners are engineered specifically for Multi-Rad sections. Made of cast iron, with expertly designed stainless steel ribbons. Design assures more even flame, more complete combustion, positive ignition and quiet operation.



Exclusive Multi-Rad heat exchanger has continuous-welded construction. Each of the multiple sections completely encloses the flame from a separate burner head. This affords greater radiation area – extracts maximum heat from fuel.

New Homes sell better when they're equipped with Delco-Heat!

Delco-Heat manufactures a complete line of automatic home heating products - for all types of fuels, all systems of heating and all sizes of homes. And our engineering and sales departments will be glad to serve you in any way possible. For information about Delco-Heat products, write to Delco Appliance Division, Dept. AF-7, General Motors Corporaration, Rochester 1, New York.

Also manufacturers of Electric Water Systems for farms and homes-fractional horsepower electric motors-electric automobile clocks.



### Just off the press-"BETTER LIGHT FOR OUR CHILDREN"

a simply written presentation on daylight control

Over the past 10 years, Owens-Illinois, in collaboration with the University of Michigan, has made an extensive study of the daylighting of classrooms with light-directing glass block. Many of our findings were reported in a series of lectures to architectural groups.

Because of the widespread interest displayed, we have condensed the lecture material in a 24-page book"Better Light For Our Children." It is brief and to the point, yet contains important facts and fundamentals of daylight control for school classrooms.

For copies for yourself, and for distribution among your school clients, just fill in and mail the coupon. Also check coupon for data on our completely new type of glass block—Insulux Number 363. It's lightdirecting, "azimuth-correcting."

American Struct Dept. G-106, P.0 Foledo 1, Ohio	ural Products Co O. Box 1035	mpany
		copies of "Better Light For ( on the new daylight-direct
Name		
Address		
City	County	State

#### TRADITIONALLY THE BEST IN BRASS

S-1735 SPEAKMAN Sentinel Balanced Pressure Mixing Valve (Concealed Model).

A triumph of engineering. Holds water temperatures steady regardless of fluctuations in pressures in hot or cold water supply lines. Works automatically on water pressure alone. No thermostats, rockers, springs or gadgets to get out of order.

## The Real News

### in showers ... is this combination ...

COLD

SENTINE

HO

1



#### OTHER OUTSTANDING SPEAKMAN PRODUCT:

#### Self-Closing Metering Lavatory Fixture (S-4150)

(3-4130) This self-closing, metering fixture cuts water waste and reduces maintenance costs. Water volume may be regulated from a "dash" to 1½ gallons per operation. Permits washing in tempered water. Non-hammering and non-dripping. Nonclogging by-pass. Operating unit renewable.

### Si-Flo Quiet Operating Flush Valve (K-9000 BSP)

(K-9000 BSP) The flush valve that whispers—never SHOUTS. Easiest to install—easiest to maintain. All wearing parts contained in single piston unit which may be removed and replaced in 5 minutes or less. Selfcleaning by-pass. Adjustable connection (54'' + or -) between valve and stop makes installation easy and compensates for slight variations in regular roughing-in of  $4^{5}4''$ . A type for every use in apartments, hotels, schools, theatres and homes.







S-1700 Complete SPEAKMAN Built-In Sentinel Shower.

Pipe size 3/2 inch. Combines the Sentinel Balanced Pressure Mixing Valve and the Anystream Shower Head to provide America's outstanding, modern shower bath. Other concealed and exposed models available for every type of installation.

# The Shower that has no equal . . .

Together—or used independently—the Sentinel Balanced Pressure Mixing Valve and the Anystream Self-Cleaning Shower Head offer exclusive features not to be found in any other shower. Here are the exclusive features that make Speakman Sentinel-Anystream Showers outstanding:

#### THE ANYSTREAM SHOWER HEAD-

- 1. Anystream Shower Heads take care of more bathers per gallon of water. Users report water savings up to 50%. This is an important feature during periods of peak demand on hot water. Provides full-pattern shower even on low water pressure.
- 2. Type of spray—From stimulating, stinging needle spray, or relaxing, smooth normal spray, to non-splash flood spray for rinsing, the Anystream delivers what the user wants. A turn of the lever sets the spray as desired. And, when turned off, there's no annoying after-drip.
- **3.** Self-Cleaning—won't clog. In flood position all dirt and sediment is immediately flushed out. Precision-built for long wear. Integral ball joint with concealed volume control (Model 1). Heads for use in public places may be supplied with Allen set screw to discourage malicious removal.



See SWEET'S Architectural File for condensed catalog, or write for complete information on these products.

#### THE SPEAKMAN SENTINEL BALANCED PRESSURE MIXING VALVE

Here's the answer to the problem of what to do about fluctuating water pressure that causes sudden surges of steaming hot or icy cold water in the shower bath. With the Sentinel, the bather sets the temperature where he wants it—and the Speakman Sentinel Mixing Valve *holds* it there. Here are the outstanding features of this valve.

- 1. Holds discharge temperatures even.
- **2.** Operation not affected by pressure variations in supply lines.
- 3. All wearing parts renewable from face of valve.
- 4. No thermostats, rockers or springs to get out of order—a simple f-l-o-a-t-i-n-g piston does the work. Minimum maintenance.







There's no mistaking the trend! Dependable, nationally advertised Emerson-Electric Attic Fans have *proved* themselves the effective, economical answer to the problem of summer comfort in the home! Fan-planning becomes a real *reputation-builder* for you . . . because the benefits are so obvious that your clients are quick to "spread the word." And remember, you save them *balf* on installation costs, by installing an Emerson-Electric Attic Fan during original construction.

Emerson-Electric's *complete* line of Home Cooler Fans and accessories lets you select exactly what you need . . . assures unmatched performance, backed by 60 years of fan manufacturing experience. For complete data, refer to 1950 Sweet's Builders' or Architectural Files, or write for Bulletin No. 409.

The Emerson Electric Mfg. Co., St. Louis 21, Mo.

SPECIFY EMERSON.

**ELECTRIC KITCHEN FANS** 

Please ber with an attractive Kitchen Ventilator Fan...to whisk away heat, smoke, and cooking odors... prevent spread of greasy vapors to walls and drapes. Easy to install in any construction. Models for wall or ceiling installation.



### PRODUCT NEWS

open ahead of the user or can be set so that a slight pressure is necessary continuously.

Developed by Pittsburgh Plate Glass Co. primarily for use on its all-glass Herculite doors, the Pittcomatic is adaptable to doors of all types and weights. It will sell for under \$500.

Manufacturer: Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22, Pa.

#### TUBE HANGER for radiant heating installations provides accurate and proper spacing.

Supporting the tubes in a ceiling radiant panel tightly against the joists, these Kynex hangers save installation time and assure proper alignment of the coil rows. They also help keep the



metal lath level when plaster is applied. Two drive points on the hangers are hammered into the face of the joists; no other fastener is required. Although intended primarily for radiant heating application, the hangers will also serve conveniently for installing parallel lines of general water piping. They will accommodate various sizes of tubes on 4 and 6 in. centers on any standard joist size and spacing. Retail price is \$38 per 1,000.

Manufacturer: The Kynex Co., 21 West St., New York 6, N. Y.

#### GUN TYPE SAW will cut in any position.

Valuable in numerous construction operations, the Transa reciprocal gun type saw will cut through a wide variety of materials—from rubber to stainless steel. The tool has a stroke adjustable up to 2 in. and special guides for blade widths of  $\frac{1}{2}$  to 1 in. are said to eliminate whipping and snapping. These guides also act as sights for accurate sawing. Equipped with a a handle which can be moved in any position to ease arm fatigue, the unit will swivel a full circle and lock in any cutting tangent. A model with all necessary accessories for attachment to



an electric drill, air drill or flexible shaft sells for \$67.50. The Transa saw complete with heavy duty electric drill is \$110.50.

Manufacturer: National Machine Tool & Supply Co., 13 N. 1 St., Minneapolis, Minn. (Continued on page 196)



# WITH STAINLESS STEEL

Customer satisfaction begins *outside* your doors when you have an inviting entrance. Stainless steel—used for marquees, as trim for windows and doors, and for ornamental paneling —will give the right approach.

To increase this sales appeal follow through with stainless steel for *interior* ornamental trim, display fixtures, fittings, etc. In addition to its attractive appearance, the maintenance cost of this steel is practically nil, as no seasonal painting or retouching is necessary. Furthermore, its proven durability is also an economic advantage, for it is practically ageless.

We do not make steel but we do produce the alloy—ferro chromium—which is the most important ingredient in stainless steel. Our Vancoram Brand Ferro Chromium is made by closely controlled processing methods from carefully selected raw materials to assist the steelmaker in the manufacture of consistently high grade steel.

VANADIUM CORPORATION OF AMERICA LEXINGTON AVENUE, NEW YORK 17, N. Y. + DETROIT + CHICAGO + CLEVELAND + PITTSBUR



CHEMICALS AND METALS



GEORGE DAUB, Architect

### A "HIDDEN FEATURE" OF MODERN HOMES-TELEPHONE RACEWAYS

Most modern homes owe their beauty to clean simplicity of design — inside and out. Such beauty is always enhanced when telephone wires are concealed within the walls.

Telephone conduit, built in during construction, makes concealed wiring easy. And it promises that more telephones may be added later with the same regard for handsome walls and woodwork. One or two lengths of pipe or tubing placed in the walls are usually enough for the average house—and the cost is low.

Your Bell Telephone Company will be glad to help you plan telephone wiring facilities for any type of home. Why not call your Telephone Business Office for free telephone planning service?





### "Myrtle is getting a lovely tan since she discovered that . . .

Everything Hinges on Hager

### ELIMINATE NOISY, SLAMMING DOORS!

Exclusive flexible friction adjustor in the barrel of Hager Friction-Type Butts controls the friction exerted to just the desired degree. Proper adjustment of friction pressure prevents doors from slamming shut... holds them open to any desired ventilating position.

Removal of screw-type-plug at top end of butt provides quick access to the slotted pin. A few screw driver turns in one direction exert additional friction that retards the ease of door movement; several screw driver turns in the other direction eliminate friction ... allow door to silently float back and forth.

Specify Hager Friction-Type Butts in hospitals or other buildings

where quietness is either desirable or a necessity.



HAGER HINGES

HAGER No. 1147 EXTRA HEAVY FRICTION-TYPE BUTT HINGE Available also with "Hospital-Type" rounded top ends to prevent attaching ropes, wires, etc.

FOUNDED 1849 - EVERY HAGER HINGE SWINGS ON 100 YEARS OF EXPERIENCE

C. HAGER & SONS HINGE MFG. CO. . St. Louis, M

# Hou've GOT A STAKE IN STAINLESS

Stainless steel's popularity for both residential and commercial roof drainage systems is growing fast. This attractive, long-lasting metal is becoming more and more important in the construction industry. Your clients will be asking all sorts of questions about using it. As an architect you've got a stake in stainless, so it's important that you know all the answers.

#### HERE ARE THE FACTS:

• Berger manufactures a *complete line* of ready-to-use roof drainage products, fittings and accessories for you. All are made of Republic ENDURO Stainless Steel, the metal proved by more than 20 years of service in buildings of every type.

Berger ENDURO Stainless Steel Roof Drainage Systems are stronger and more attractive than ordinary systems. Virtually weatherproof, they do not rust or tarnish. They do not bleed or discolor paint. They resist the action of corrosive industrial atmospheres as well as salt-laden coastal atmospheres. Virtually wearproof, they resist abrasion and denting. They have the strength needed to stand up under heavy ice and snow loads. They withstand severe temperature changes without expansion cracking and buckling.

Very likely, a Berger all-ENDURO Roof Drainage System will serve for the life of the building on which it is hung. It will require little or no maintenance, will save your client trouble and expense, will cost him less in the long run.

You'll find distributors' stocks of Berger ENDURO Roof Drainage Products in most cities, and competent sheet metal contractors to erect them. Write us for more information, without obligation.



IN A LABORATORY ''ICEBOX'' BIG ENOUGH TO HOLD A HOUSE

### tests prove principle by which the INSULITE<sup>\*</sup> "Wall of Protection" controls moisture condensation in walls!



7-50 MINNEAPOLIS 2, MINNESOTA

To find out by scientific experiment how to prevent moisture condensation (and frost) in walls, a prominent Mid-West University built a giant "ice-box" 30 feet square and 25 feet high, cooled by a 25 ton refrigerating machine.

Inside, they built a full-size four room bungalow of standard construction but with removable wall sections of various materials to document the test. The house was heated to  $70^{\circ}$  F. with humidities up to 40%. The outside was cooled to  $-10^{\circ}$  F. to duplicate winter conditions.

#### Here's what they found out

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To properly control condensation, a wall should be "sealed on the warm side and vented on the cold side." This is *exactly* the principle of construction used for 10 years in the INSULITE Wall of Protection.

INSULITE Sealed Lok-Joint Lath provides the vapor barrier required on the warm side of the wall. Bildrite Sheathing on the cold side of the wall provides permeability that lets vapor "breathe" through towards the outside. The IN-SULITE Wall of Protection controls moisture condensation and frost in walls. Now is the time to build winter comfort into your homes. Correct construction is important at any season—summer or winter.

AND in addition, you get extra bracing strength, extra insulating value and extra protection because INSULITE is asphalt-treated inside and outside—every fiber protected. Specify Double-Duty INSULITE for better wall construction: Refer to Sweet's File, Architectural Section 10a/8



Too many architects, builders and floor covering dealers use an incomplete line of reasoning when they come to selecting floors for commercial or residential kitchens. They say, "Kitchens are greasy . . . grease ruins rubber . . . therefore I can't use rubber tile in the kitchen."

NOTHING COULD BE FURTHER FROM THE TRUTH! In using this line of reasoning they are depriving their customers of the best possible floor covering for the purpose.

Let's look at the facts and see why, instead of being unacceptable, WRIGHT RUBBER TILE is completely satisfactory for kitchen use.

THERE ARE ALL KINDS OF RUBBER with all degrees of resistance to oil. There are rubber packings for hydraulic pumps that give excellent service even though they are in constant contact with oil. In view of this fact it is not wise to condemn a floor covering for service in oily areas just because it is rubber.

THERE ARE ALL KINDS OF RUBBER FLOORS. Some rubber floors are soft, some are porous, and some have porous fillers. Some manufacturers of rubber tile recommend that their material not be used in kitchens.

BUT WRIGHT RUBBER TILE is dense, firm, tough and nonporous. It has excellent resistance to all normal exposure to oils and greases and there is plenty of proof to support this statement.

For example, WRIGHT RUBBER TILE has been successfully used in commercial and residential kitchens for nearly thirty years. Service has been excellent and many users have specified WRIGHT RUBBER TILE repeatedly. In more severe service, WRIGHTFLOR Hard Surface Rubber

In more severe service, WRIGHTFLOR Hard Surface Rubber Tile has been used successfully in service stations where the floors are in constant contact with gasoline, oils and greases. The Bausch & Lomb Optical Company has used WRIGHTFLOR successfully in their plant where the floor is constantly exposed to kerosene, oils, abrasives and ground glass.

There is no doubt that WRIGHT RUBBER TILE is grease resistant. Furthermore, its clear colors make a more beautiful floor. The dense, smooth, non-porous surface makes the floor easier to keep clean and new looking. Its resilience makes it more comfortable to walk on and provides extra safety in the form of skid protection. Lastly, its long life makes it more economical. In short, WRIGHT RUBBER TILE is the finest of all floor

In short, WRIGHT RUBBER TILE is the finest of all floor coverings for kitchen use. Don't let a superstition place you at a disadvantage. Get acquainted with WRIGHT RUBBER TILE and you will be specifying it more and more.

WRIGHT MANUFACTURING CO. 5204 Post Oak Road • Houston 5, Texas

FLOORS OF DISTINCTION

WRIGHTEX—Soft Rubber Tile
WRIGHTFLOR—Hard Surface Rubber Tile
WRIGHT-ON-TOP Compression Cove Base

2427

RIGHT RUBBER TILE

### **PRODUCT NEWS**

#### METAL FURRING CHANNEL is adaptable to many kinds of ceiling and wall construction.

Screwlock is a new type of furring channel which provides a secure gripping surface for wall and suspended ceiling materials in new installations and remodeling. Although it does not alter usual

methods of suspension channels are attached to carrying members by tie wire or hanger clips—it does permit attachment of a variety of materials. Acoustical tile, thermal



insulation, ceiling and wallboard, wood furring strips—any material that can be screw-attached —may be applied to Screwlock. Building paper and vapor barriers also may be attached directly to the channel. Made of 26 gauge nonrusting metal, the 23¼ in. channel is wide enough for boards or tile to be joined end to end without special clips. Depressed perforations covering the



surface guide the screws into nearest openings and grip them firmly to protect the installation against jarring. Individual tiles applied to Screwlock may be replaced without disturbing the rest of the job. Clips are also available for attaching the channel to masonry.

Manufacturer: Sanymetal Products Co. Inc. Nailock Div., 1698 Urbana Rd., Cleveland, Ohio.

#### NAILS with recessed heads are driven easily into acoustic tile perforations.

By placing the head shoulder of this steel nail below the rear head, the manufacturer has devised a new fastener for perforated acoustical tiles. The collar allows the nail to be hammered flush with the tile and secured positively without damaging the tile's surface. Cadmium or nickel plated as a safeguard against rust streaks, the



new nails are available with plain shanks or with barbed annular threads. Prices for the  $\frac{3}{4}$ , 1, 1 $\frac{14}{4}$ and 1 $\frac{1}{2}$  in. nails range from 70 cents to \$1.05 per 1,000, depending on size and quantity ordered. *Manufacturer*: John Hassall, Inc. Oakland & Clay St., Brooklyn, N. Y.

(Technical Literature, page 200)

# **4-Square Special S2E Joists**

### **KILN-DRIED FOR STABILITY...SIZED FOR STRENGTH**

People who buy homes are not only interested in design and floor plan, but they also have a consuming curiosity about construction. "Is this going to be a well-built house?" they ask.

When you explain the structural values, the low upkeep and long life you have incorporated in your design, tell them about Weyerhaeuser 4-Square S2E Joists.

Joists must not only support loads over spans . . . they must also impart stability and stiffness to a structure. They must support loads without movement.

Specially kiln-dried to a 12% moisture

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Architects who specialize in the design of homes and small structures find in Weyerhaeuser 4-Square S2E Joists the strong, stable, load bearing members they need for sound construction.



Design for COMFORT, BEAUTY and ECONOMY with SPECIAL 4-SQUARE LUMBER PRODUCTS

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Another distinguished name—that of the New Orleans *Times-Picayune*—has been added to the growing roster of modern buildings air conditioned by Chrysler Airtemp. When the decision was made to air condition this newspaper plant—Chrysler Airtemp was, naturally, the logical choice.

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### **INSTALLING WALL TYPE CLOSETS IS THE** EASY, FAST, SAFE WAY

ALL CLOSET FITTINGS

FOR WALL FIXTURES

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NEW Zurn Catalog and Handbook No. 50 on Wall Closet Fittings and Carriers for Wall Type Fixtures

> floor and the fixture are more easily and quickly cleaned. Wall type toilet facilities are more sanitary and reduce maintenance cost.

The Zurn Way lifts fixtures up off the floor-

frees them from support of the wall. Both the

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HE NEW ZURN Carrier Catalog and Handbook No. 50 is the only complete and authoritative book on when, where and how to install wall type fixtures. It's a time-saver-leaves nothing to be guessed at! It is virtually a manual for the specification, buying and installing of all types and makes of wall fixtures. Write for a copy now! You'll be needing it! No charge to architects, engineers and contractors.

The Zurn Way is the fast way; adjustments are easy; nothing is left to chance. Wall type closets installed in batteries or singly with Zurn Wall Closet Fittings provide all necessary drainage facilities up to the drainage line. Zurn Wall Closet Fittings are designed for any make of wall type closet.

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Name and Title	Company
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America's NEW pleat-type door closure with the cornice that gives it a "finished look,"

folDoor is the answer to SPACE SAVING, to an unheard of FLEXIBELITY of roomarrangements, to new, up-to-theminute BEAUTY.

**folDoor** is the best looking door closure you ever saw. Folds into beautiful pleats into an unbelievably small space, can be operated by a child . . . and open or closed, retains its beautiful pleated lines to add charm to any room.

Built on a rugged, rust-resistant steel frame, folDoor comes in a wide choice of beautiful, colored plastic fabrics to harmonize with any color scheme and is topped off with an attractive, formed cornice that gives it a "finished look."

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### **TECHNICAL LITERATURE**



LIGHTING. Better Light for Our Children. Insulux Div., American Structural Products Co., Ohio Bldg., Toledo, O. 24 pp. 6 x 8 in.

Presenting an easily comprehended explanation of the principles of light control through the use of light-directing glass block in combination with clear glass windows, this booklet is an excellent non-technical post script to the manual *Daylight in School Classrooms* published in 1947. Line drawings show how prismatic glass block directs daylight toward ceilings, which reflect it downward for even distribution over work surfaces throughout the room.

Health advantages (to child growth and posture as well as eyesight) resulting from proper fenestration are illustrated graphically. A simple device provides the reader with a convincing demonstration of how good seeing conditions are achieved by eliminating excessively high and low lighting contrasts.

WALL AND CEILING PANELS. Marlite Wood and Marble Patterns. Install it Right with Marlite. Marsh Wall Products, Inc., Dover, Ohio. 4 pp. 16 pp. 81/2 x 11 in.

The first of these publications is a full color folder which shows the manufacturer's new wood and marble pattern plastic-finished wall panels. Five of the patterns reproduce the coloring and grain of selected woods. Five others simulate the surface of rare marbles. The new patterns are adaptable to many architectural treatments and decorative themes. Like other Marlite plastic finished panels the new wall panels are durable, easy to handle and maintain, and are moderately priced.

Utilizing the slide film technique of still shots and dialogue, the second booklet gives complete directions for installing Marlite panels.

METAL DOORS. Building Products. Virginia Metal Products Corp., Product Information Dept., 60 Hudson St., New York, N. Y. 38 pp. 8½ x 11 in.

Construction features, listings of types and sizes, and detail drawings provide complete reference on the manufacturer's insulated hollow metal doors. Also covered are preassembled steel frames, a fire-rated door and frame combination, and sliding doors and frames.

(Continued on page 206)





100 square feet of KoolShade sunscreen equals 1 ton of air conditioning. KoolShade is like a miniature venetian blind of woven bronze, with louvers set at a 17° angle to block up to 90% of the sun's heat rays outside the window...keeps rooms up to 15° cooler; light comes in; heat, glare and insects stay out.

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KoolShade is up to 4 times more efficient than awnings ... no canvas to rot, clear vision, no fire hazard, no projections to interfere with architectural lines.



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### LOWEST COST SOUND CONDITIONING

Right: Library ceiling shows typical use of **Zonolite Acoustical** Plastic. Frequently, low cost and ease of application over irregular surfaces permit use where other acoustical treatments would be prohibitive.



The new Senile Ward Building-Eastern State Hospital, Medical Lake, Wash.-illustrates graphically how Zonolite vermiculite aggregates are used in plaster and concrete to eliminate dead weight. They permit construction of class-A buildings at great savings over conventional materials. Many observers declare that the Medical Lake job could not have been built without lightweight aggregates.

A Zonolite Acoustical Plastic used

B Paper-backed, welded wire

mesh for Zonolite concrete roof slabs.

proofing girders with Zonolite Plaster.

D Installing radiant heating pipes

E Zonolite Plaster 2" solid parti-

over Zonolite concrete floors.

Applying metal lath for fire-

on library ceiling.

C

2 × 8 CARPET NAILER

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COILS IN

tions and for fireproofing beams, up to 66% of the dead weight was eliminated. Zonolite concrete used throughout for lightweight roof and floor slabs weighed only 20% as much as conventional concrete applications. This wholesale elimination of dead weight made practical the use of CONSTRUCTION DETAILS

much lighter structural steel members. By reducing weight in these 3 ways, further drastic reductions in time and costs were made possible. But why not get the whole story?

lieu of conventional materials for sus-pended ceilings, for 2" solid parti-

Mail the coupon below for a detailed story about the Medical Lake job and complete reference material on the use of Zonolite Vermiculite Aggregates.

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You'll be delighted when you see how your finished MOULTILE Floors reflect the beauty in your mind's eye. There's much about MOULTILE to please your clients, too. For example, see what MOULTILE does for store floors. The radiant, harmonious colors set the stage for sales by enhancing merchandise on display . . . subtly suggesting store prestige. Hard-wearing MOULTILE retains its clarity of color even after years of heavy traffic. Shoppers and salespeople will appreciate the walk-easy buoyancy and slip-safe footing provided by MOULTILE.

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# Beauty's not the half of it .... with "MODERNFOLD" doors

Of course, "Modernfold" accordion-type doors are beautiful! Their colorful, distinctive vinyl covering is fire-resistant, will not crack, peel or fade. This alone was good reason for the architect to choose them for this beauty parlor. But that's not all!

they save space! Here, too, is more room for placing furniture... for improving and balancing decoration. That's because "Modernfold" doors don't swing... they fold to save the space swinging doors waste.

they insure privacy! The shop's customers need never fear invasion of privacy—for "Modernfold" doors are solid, sturdy closures, thanks to a rigid steel frame. And, incidentally, this assures smooth, dependable service for years and years.

in application after application. This is, of course, only one example of how "Modernfold" doors solved an architect's problem. They provide infinitely greater scope in planning for all kinds of commercial and residential building. Many times, for instance, a "Modernfold" door acts as a movable wall to create two rooms out of one.

Why not see if "Modernfold" doors can aid you either as a closure or a partition? You'll be surprised how little they cost. For full details look up our installing distributor in your classified telephone book under "doors"... or mail coupon.

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Special coil manufacturing equipment assures uniformity of coil quality and dependability.

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For practically every cooling or heating application, you will find a Sturtevant coil that fills your needs. Because it is built under rigid specifications by skilled craftsmen using specialized equipment, it will be a quality product—with performance proved through years of successful installations.

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Sturtevant's complete, standardized line contains all types and sizes of heat transfer coils. They are available in a wide range of capacities, with aluminum or copper fins that offer minimum resistance to air flow and are easy to clean.

By specifying Sturtevant, you are assured of long coil life at rated performance . . . the product of sound engineering, modern tooling and first-class workmanship. Call your nearest Westinghouse Sturtevant Office, or write to Westinghouse Electric Corp., Sturtevant Division, Hyde Park, Boston 36, Mass.

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First-The TEMCO Gas Floor Furnace brought automatic heat within the reach of every home builder, Now - TEMCO offers a Gas Wall Furnace for installation with any type of construction. The TEMCO Gas Wall Furnace requires no basement, can be installed on first or second floors or where slab type foundation is used. Check the possibilities of a TEMCO Gas Furnace before you specify the heating system for any

home. And-weigh carefully these TEMCO Gas Wall Furnace Features:

- Easy to install Fits between standard 16" o. c. stud construction.
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### **TECHNICAL LITERATURE**

AIR CIRCULATION. How to Cool for Comfort. Hunter Fan & Ventilating Co., 400 S. Front St., Memphis, Tenn. 32 pp. 81/2 x 11 in.

This manual on proper use and installation of fans incorporates many additions to the 1949 edition. The first three sections cover the cooling and ventilating problems encountered in residential, commercial and industrial buildings. Basic design data is presented for each kind of construction and modifications for local climates and special types of occupancy are noted. A technical section includes definitions of terms used in air control. Detail drawings illustrate 30 kinds of installations.

AIR CONDITIONING, Controlled Humidification. Bulletin 1771. Armstrong Machine Works, Three Rivers, Mich. 12 pp. 81/2 x 11 in.

This publication describes steam humidifiers for automatically controlling relative humidity for prevention of dry air damage to paper, leather, wood, foods, textiles and other materials in storage or in process. Explaining the effect of relative humidity on human comfort and health, the bulletin then tells how maintenance of proper humidity prevents the fire and explosion hazards of static electricity where there are inflammable dust, vapors or liquids. Tables give the desirable relative humidity for various industries, and water content of saturated air at different temperatures. Installation, operation and prices of eight models of the firm's steam humidifiers are also contained in the booklet.

HEATING. Kohler Boilers. Kohler Co., Kohler, Wis. 16 pp. 81/2 x 11 in.

Boilers fired by hand, stoker or oil which are adaptable to both domestic or commercial use are described fully in this new illustrated catalogue. Also included is information on selection and installation of the boilers.

CONDUITS. National Electric Conduits. Catalogue No. 603. National Electric Products Corp., Chamber of Commerce Bldg., Pittsburgh 19, Pa. 30 pp. 81/2 x 11 in.

The first half of the booklet is devoted to the manufacturer's rigid steel conduits. Electrical metallic tubing and fittings are then reviewed as well as flexible steel conduit for branch circuit wiring. Non-metallic tubings are listed by inside diameter sizes. Flexible metallic (brass and steel) tubing and accessories complete the catalogue.

STORE WINDOW SHADES. Infra-Chem Transparent Shades. Transparent Shade Co., 501 N. Figueroa St., Los Angeles 12, Calif.

A new color chart depicts in small scale how Infra-Chem transparent shades look in three different store windows. Offering sun protection plus visibility, these shades are available in Amber, New Gold and Clear Blue.

(Continued on page 212)

PRACTICAL. IN PUBLIC PLACES **CABOT'S STAIN WAX** 

In stores, restaurants and office buildings, Cabot's Stain Wax gives an attractive, durable finish for plywood paneling, woodwork, molding and trim. Inexpensive to apply . . . wearresistant . . . easy to keep clean and maintain.

Cabot's Stain Wax produces the rich color of an interior stain plus the soft lustre of a wax finish all in one application. Keeps interior decoration costs low.

Complete range of colors, including White, Silver Gray, lvory and other unusual blond shades.

WRITE TODAY for color card and complete information.

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Write for data on Fedders Unit Heaters, Convector-Radiators, Wall Radiation and Baseboard Radiation for home, commercial, industrial and institutional needs.

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FACTORIES: POMONA, Calif.; Newark, New Jersey WAREHOUSES: Los Angeles, San Francisco, Chicago

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A postcard will bring you complete Blo-Fan information. Manufacturers of Pry-Lites — the modern recessed lighting fixtures with snap-on fronts. PRYNE & CO., INC., BOX A-7, Pomona, Calif.



#### ... for finest construction and true economy

One-piece glued laminated chords of the Tim-Truss provide a permanently stable, fire retardant bowstring truss with span of from 40 to over 150 feet.

Attractive Appearance. Open, streamlined, with minimum number of web members; creates handsome wide span areas. Ceilings are not necessary.

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For additional information on the Tim-Truss, see the Timber Structures office nearest you, or write for catalog, "Timber Members".







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Architectural Concrete

THESE THREE distinctive state government buildings in the new Capitol Center at Tallahassee demonstrate the versatility of architectural concrete. They combine impressive beauty with rugged strength, economy and durability.

Architectural concrete is equally adaptable to schools, hospitals, theaters, apartments, stores, factories and office buildings. It fulfills every construction requirement—firesafety, fine appearance, low upkeep expense, long life. It delivers dependable, *low-annual-cost* service year after year.

Architectural concrete is economical because both the structural and ornamental parts (molded to express any design or period desired) can easily be cast in a single operation.

By applying the tested and proven principles of quality concrete construction, architects can design architectural concrete buildings with every assurance of lasting satisfaction to client, taxpayer, investor and designer alike.

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Dept. 7-7, 33 W. Grand Ave., Chicago 10, III. A national organization to improve and extend the uses of portland cement and concrete...through scientific research and engineering field work



These three architectural concrete buildings, Florida Supreme Court (top), Industrial Commission (above) and State Road Department (below) are located in Capitol Center, Tallahassee. Architects and engineers: Yonge and Hart and James Gamble Rogers II, associated architects. Respective contractors, top to bottom: J. A. Jones Construction Company, Henry C. Beck Company, Southern Builders, Inc.







... in elevatoring Passengers can't help being curious. Signaling for an elevator is no longer a push-the-button-and-wait routine. It's an exciting, and somewhat mystifying, experience with the new Otis electronic touch button. Nothing moves. A mere touch of a finger lights the directional arrow.

What makes it work? The Otis electronic touch button has no moving parts; no contacts. There's an electronic tube behind each arrow. A simple touch excites the tube and lights it to show that the call has been registered. Then, as a car arrives, the call is canceled; the tube stops conducting and goes dark. Simple — and dramatic!

The Otis electronic touch button dramatizes another great advance in vertical transportation – <u>AUTOTRONIC Traffic-Timed Elevatoring.</u> You'll find it in 88 NEW and MODERNIZED office buildings, hotels, banks, hospitals and department stores. Otis Elevator Company, 260 11th Avenue, New York 1, N. Y.






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• This unit heater promotes gas to top place as America's wonder fuel for cleanliness. Reznor heating experience dates back to the gas industry's pioneer days. As a result, the new 1950 suspended and floor unit heaters are as up-to-the-minute as America's finest stores, offices and manufacturing plants. Yes . . . Reznors are the world's fastest selling gas unit heaters. See your dealer now or write direct to Reznor Manufacturing Co.

Gas Unit Heaters Since 1888

REZNOR MANUFACTURING CO. 20 UNION ST. MERCER, PENNA.

### **TECHNICAL LITERATURE**

**PAINTS.** Color Conditioning. Dept. P. R. 2, Finishes Div., Du Pont Co., Wilmington 98, Del. 24 pp. 81/2 x 11 in.

Down-to-earth ways of making color work to advantage furnish the theme for this handsome booklet. "Color Conditioning" is the name given to Du Pont's painting plan, an outgrowth of many years of research on functional use of color. Initiated in the '40s for industrial plants as a means of creating pleasant working surroundings, and hence cutting down absenteeism, the system has been developed currently to cover other places where people work and congregate—restaurants, apartments, hotels, offices, stores, etc.

Serving in hospitals to speed recovery for the convalescent, in schools and offices to increase the proficiency of the student and employee, color in the store is described as "an asset to proper merchandising; it attracts customers, *sells* them, invites them back again and again." Because color plays a very large part in establishing the character of any store, the business man is advised to consider color as carefully as the merchandise he plans to stock. Shades recommended in this category have been formulated for customer appeal. Attraction of brightness and attention in highlighting are two effective uses of color illustrated. Schemes for large areas are also pictured and explained.

A companion 16 mm. film, *The Case for Color*, deals with psychological use of color. It is available for showings at no charge.

METAL FRAMING. Unistrut Concrete Insert. Unistrut Products Co., 1013 W. Washington Blvd., Chicago 7, III. 4 pp. 81/2 x 11 in.

This illustrated bulletin describes an improved low cost concrete insert. A feature pointed out for the new product is that its continuous slot permits attachment of fittings at any point along the entire insert face without disturbing attachments made previously. The bulletin also explains a way of making concrete inserts from short pieces of Unistrut channel by adding anchor type drive-in end caps. Complete specifications and ordering information are included.

CONCRETE, 15 Steps to Better Concrete Construction. Sika Chemical Corp., Gregory Ave., Passaic 8, N. J. 12 pp. 81/2 x 11 in.

This illustrated booklet, written for architects and consulting and construction engineers, gives detailed information and specifications on the manufacturer's compounds, which are formulated to meet certain problems of concrete and masonry construction. Among the products described is Plastiment Retarding Densifier, said to make structures resistant to water, cracking and absorption and to keep water content, concrete quality and setting time uniform regardless of atmospheric temperature. Composition of 14 other materials for coating, sealing, hardening and repair work on concrete and masonry are discussed and their specific applications explained.



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Intermediate Steel Windows

**Industrial Steel Windows** 



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Special equipment! Special technique! Complete quality control by highly skilled craftsmen of America's oldest and largest steel window manufacturer-Fenestra\*!

Hot-dip, keyed-in galvanizing-after fabrication! No metal left unprotected!

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## STEEL-STRONG WINDOWS MADE TO STAY NEW





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Architects and Builders Release Results to "Press"

As a result of the national advertising being done by the Morrison ROLY-DOOR, the new four-sectional, all-steel overhead residential garage door, architects and builders interviewed ROLY, and released these answers to the "Press"...



QUESTION: What's your price set-up?

ANSWER: Precision engineering and mass production methods in one of the country's most scientific modern steel stamping plants—plus new design principles make possible the industry's lowest cost for the world's only residential all-steel four-sectional over-head garage door. No extras to buy—it's complete even to stops, rubber astragal, hangers,

QUESTION: How many Philadelphia lawyers do you need to install a ROLY-DOOR?

ANSWER: It is only necessary to install the tracks, drop the sections in place with rollers inserted, snap pivot points of adjusting sections together, and connect springs. There are no holes to drill, no hinges to apply. No skilled workmen or special tools are necessary. Because of the simple installation, the Morrison Roly-Door is installed in a fraction of the time required for other overhead doors.

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 ANSWER: Made of steel roll formed into a rigid cross section, it is sag-resistant with rugged all-welded steel construction. Nothing to rot or warp; no knots or panel splays to fall out as it weathers; no soft metals to dent, pit or corrode.

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ANSWER: It needs no painting—because its finish is baked on in enduring neutral grey; no priming or finish-coat painting after installation (it will take any ordinary paint, should the home-owner prefer).

QUESTION: What do we have to do to get it O.K.'d to meet building codes specifications?

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ANSWER: Write us for name of nearest distributor !

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From the side having the strongest illumination, *Mirropane* looks like an ordinary mirror. From the other side, *Mirropane* is transparent.

The idea of a partition, or a window, glazed with this exciting product opens up important new possibilities for better supervision and better protection. For more information, write Liberty Mirror Division, Libbey Owens Ford Glass Company, 9875 Nicholas Building, Toledo 3, Ohio. \*®



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