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Inquiry Department

Architectural Magazines

Painting of Steam and Hot Water Radiators

Vol. 3 September, 1935 No. 9

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The Architectural Magazines

A Review by Richard Philipp

The AMERICAN ARCHITECT brings an article on Miami Beach which shows what a city can do under conditions that would almost annihilate most communities. It is a good example to place before the country when so large a proportion of our country is running to the government yelling for help. Then follows a variety of smaller houses which have been built at Miami Beach, and some rather interesting. That the small house is getting much attention these days is shown by the competitions held by the New York Chapter of the A. I. A. The plan of the winning design is fairly acceptable, but the elevation is just poor stuff. It shows that a great deal has still to be learned about small houses, and perhaps that a great deal can be taught the juries that select the winners.

There is another installment about the legal side of Architecture, by Clinton H. Blake, which should be read by every architect. AMERICAN ARCHITECT is doing good work with these articles.

The main article of the number is on concrete, giving some interesting examples. I have never been able to see any artistic effect in the texture produced by the use of rough boards for the forms, and I am not as yet convinced that concrete exposed to the climatic conditions as they exist in our northern states is a permanent material, unless care is taken to thoroughly waterproof it. That in most instances is difficult.

The FORUM presents in its leading article a modernistic house which I do not like. These long rows of windows cutting an entire facade in half, are no longer original; and as expressing anything, they don't express anything but the whim of some designer.

Another thing that seems to me to be utterly silly is the supporting of a huge mass on a couple of pipe stems. Possibly the engineering computations prove that it can be done, but, that does not necessarily make it good architecture.

The interiors are pretty cold and bare.

There is an article by Dr. Ernst Kahn on "Economics of Housing in the United States," that is most timely now, with small unit housing getting under way. Nobody is probably better qualified to speak on this subject than Dr. Kahn.

The two entrances given on the color prints presented in this number, one to the Maison Francaise, the other to the British Empire Building at Rockefeller Center, I should like to see before saying much about them. They may be finer than the photos indicate. The one to the French Building looks to me like a lot of figures and ornament just sprawling over a given area, without much design. I used to think that the old fellows of the Italian Rennaissance knew something about handling low relief sculpture, but judged by these later standards, perhaps they didn't.

John Russell Pope's church at New Rochelle is a fine example of a Colonial structure, but I am not sure that it was necessary to carry the cornice of the main building around the tower. It rather mars the proportions of the tower.

I don't quite know what to make of the German Church. The interior looks a bit like some of those the men of the Rennaissance left unfinished, hoping some day when they got more funds they could complete them.

The Ford Building, at San Diego, is well presented with photographs and scale drawings. It is worth a good deal of study, both the way the plan has been worked out, and the exhibits presented. As an exhibition building it is probably hard to beat.

In reading the article on "Air Conditioning for Homes," I came upon a gem. It was like pawing over a lot of gravel and finding an emerald. The article among other things speaks of one Waverly Taylor, youthful veteran among Capitol (Washington) Builders, being a bellwether of the business (of building whole sections of the city). Well, here is the gem:—"Well up in Washington's social ladder, he knows what smart people have, and knows how to give the non-smart a close approximation of the real article." But why? Why not give the non-smart what exactly fits them? I wonder whether, in the long run, they would not be happier with that. Isn't that just another example of some one individual foisting his own pet whim upon the many? That is exactly the wrong approach to a problem. That isn't solving the problem at all. Just another version of the old story of "keeping up with the Joneses."

The RECORD brings a good deal of interesting and informative data on the "Moderate-cost Private House." It also presents the winners of the New York Competitions. Frank Foster should have done better, considering how superbly well he usually does houses. J. Andre Fouilhoux's fourth prize, I think, is better than his first, all things considered.

The articles on "Heating the Small House" and the one on "Electricity for the House" are well worth careful reading.

H. Van Buren Magonigle's "Upper Ground" in the August number of PENCIL POINTS has given me a great deal of enjoyable reading. In most of the things he says I fully agree with the old veteran, and he says them in a delightful way. Among other things he says:

"Dragging democracy into architectural problems seems to be quite popular just now. To me, democracy has nothing to do with it. If architecture is anything, it is, like all the arts, distinctly and essentially aristocratic. The group or the mob have no part in it; the best results have always been achieved by the individual, who sits down on his little behind and does it, without talking very much about it and without side glances at

(Continued on page 7, col. 2)

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Gustave A. Dick

This will concern itself entirely with our departed fellow architect, Gustave A. Dick, who passed to his great reward on the 10th day of July, 1935. Gus Dick, as he was known to his intimates, was a happy-go-lucky fellow. He never let worry worry him. His very nature rebelled against anything so "trivial." His love of life was a passion with him. And he got a great deal of pleasure out of it. One of his greatest joys was globe trotting and he indulged in this to the utmost of his ability. It is recalled that his last long and lengthy jaunt was to Egypt where he revelled in the wonders and glories of past ages. His boyish enthusiasm of the things that impressed him there are still a happy recollection.

Then his fling in politics was another one of his happy adventures. Though he rarely sought office for himself he was always in the inner councils of the party and the political leaders that he chose to align himself with. With his party in power he sought and found plenty of excitement of this kind. Mr. Dick was quiet and retiring to a large degree. He was never active in the councils of the architectural organizations in which he held membership. In fact it is recalled that never, in the many years of activity of the writer, had he ever attended a meeting. But when his services were required he was on the spot. He sensed and recognized duty.

Mr. Dick was a product of that old and prominent office of the 90's — H. C. Koch & Co. Here he received a thorough grounding in the fundamentals of architecture. Then he matriculated at the University of Pennsylvania. Following his graduation from that institution he came back to Milwaukee and after some years formed a partnership with H. W. Buemming under the name of Buemming and Dick. This lasted for quite some years and when it was dissolved, he practiced independently until Alexander H. Bauer was admitted to partnership when the firm name became Dick and Bauer which it continued up to the time of his demise.

The things that appealed to him most in his chosen profession he became very proficient in. As for example it is recalled that he made the most beautiful and delightful pen and ink renderings. He came under the spell of a well known teacher of this art while at the university which accounted for the drawings he made in this medium.

Gus Dick will be missed by those that knew him best.

—ALEXANDER C. GUTH.

Calendar

FRIDAY, SEPTEMBER 20—

Annual meeting of District No. 7, Election of officers, Builders' Club, Milwaukee, 8:00 P.M.

FRIDAY, SEPTEMBER 20—

Meeting of State Executive Board, City Club, Milwaukee, 12:15 P.M.

Painting of Steam and Hot Water Radiators

For a number of years this subject has received considerable attention from the public, and it is apparent that the essential facts have not always been understood. The object of this note is to supply the more important facts in the case.

It will appear that as far as their effect on the performance of radiators is concerned, paints fall into two classes, first, those in which the pigment consists of small flakes of metal, such as the aluminum and bronze paints, most commonly used for painting radiators, which produce a metallic appearance and will be called metallic paints; second, the white and colored paints, in which the pigment consists, not of the metals but of oxides or other compounds of the metals. Thus white lead paints, or those containing compounds of zinc or other metals, will be called non-metallic paints. These non-metallic paints are obtainable in practically all colors, including white and black, while the metallic paints have the color of the metal or alloy of which the flakes are composed.

We will state at the outset the principal conclusion, which will be explained in more detail later, that the last coat of paint on a radiator is the only one which has an appreciable effect; and that a radiator coated with metallic paint will emit less heat, *under otherwise identical conditions*, than a similar radiator coated with non-metallic paint. In order to obtain the same amount of heat from the two radiators just considered, the temperature of the one painted with metallic paint must be somewhat higher. Under these conditions, exactly the same amount of heat is being supplied to the two radiators, and since neither the boiler efficiency nor the heat wasted in the pipe lines is appreciably affected by small changes in radiator temperatures, practically the same amount of fuel is required to supply the heat in each case. In other words, while it may be desirable for various reasons to avoid the use of metallic paints on radiators, no appreciable saving in fuel will result from the use of non-metallic rather than metallic paints.

The purpose of a heating system is to maintain the rooms in a house at some temperature higher than that prevailing out of doors. The heat which is developed by burning fuel is transferred to the rooms by means of the radiators. A radiator neither creates nor destroys heat, and a large radiator, while it can put more heat into a room than a small one, must be supplied with all of the heat it puts in. In the sense that they ultimately transfer all the heat supplied into the room, all radiators are 100% efficient. The word "efficiency" is, however, used in other ways, and it is now customary to use it on all possible occasions, but it is hardly correct to say that putting metallic paint on a radiator reduces its efficiency when the effect is merely to reduce its capacity. The size of the radiators in a house can only affect the fuel required for heating by increasing or decreasing the heat wasted in transmission from furnace to radiator and that lost up the chimney. Only when the radiators are so small as to render the whole heating plant ineffective is an appreciable saving of fuel to be expected by installing larger radiators.

After these preliminary explanations, we may proceed to consider what kind of effects may be obtained by the use of various kinds of paint. The heat emitted from a radiator is removed in two ways: first, the air streaming past the radiator and rising from it is heated, and carries the heat to other parts of the room; second, the hot surface of the radiator emits heat by radiation just as the glowing electric and gas heaters do. Most types of steam and hot water "radiators" emit less than half their heat by radiation, and evidently the name "radiator" although universally used, is not a particularly appropriate one.

To take a concrete case, a particular sectional cast iron radiator if painted with any non-metallic paint might transfer into the room, 180 Btu per hour for each square foot of its surface, if supplied with the necessary amount of heat from a boiler. (A British Thermal Unit or Btu is the amount of heat required to raise the temperature of one pound of water by 1° F.). The burning of one pound of good coal produces about 12,000 Btu and if the coal is used in a domestic heating plant, perhaps half of this, or 6,000 Btu might finally be transferred from the radiators into the rooms. Most of the other half of the heat produced is inevitably lost via the chimney.

The area of one section of a cast iron radiator is about 2 square feet for the smaller sections and up to 7 or 8 square feet for the larger sections so that a 10 section radiator would have a surface area between 20 and 80 square feet.

Of the 180 Btu per hour transferred, about 2/3 or 120 Btu would go to heating the air which passes over the radiator. The 120 Btu transferred directly to the air would not be increased or decreased by repainting the radiator. The remaining 60 Btu not carried off by the air is emitted as radiant energy. The amount of radiant energy which can be emitted per hour by the hot

First Installation

In the home of Dr. William P. O'Malley, 6132 Washington Circle, Milwaukee, what the manufacturers call the "only completely complete winter air conditioning unit" has just been installed. It is The Quiet May S. A. C. (steam air conditioning) unit, which is a combination steam-heated air and direct-fired furnace.

The entire unit, blowers, filters, humidifiers and heating equipment, is completely encased in a single modernistic cabinet and makes, according to the distributors, "a most beautiful job."

surface is dependent upon the kind of paint used for the last coat. It was assumed that the radiator was painted with non-metallic paint. If it be repainted with a metallic paint, such as aluminum or bronze, it will no longer be able to radiate 60 Btu per hour, but may be able to radiate only 30 Btu, so that instead of transferring 180 Btu to the room per hour, it can now transfer only 150 Btu. The coat of aluminum or bronze paint is not an insulating covering like a covering of magnesia or asbestos, but it has a similar effect, although for an entirely different reason. The resulting reduction in heat emission is entirely due to the reduction in the radiating power of the exposed surface, rather than to the insignificant insulating value of the thin layer of paint. It is therefore evident that undercoats of paint, regardless of kind, have no significant effect on the performance of the radiator, except in the practically impossible case where the paint was thick enough to act as an insulating covering. In repainting a radiator, it is therefore unnecessary to remove the old paint. The effect of adding the metallic paint is equivalent to removing 1/6 of the radiator, or nearly 17%, or as if one section out of six had been removed. Thus a radiator of five sections painted with white or colored paint should be about as effective as another of six sections of the same kind, painted with metallic paint, since each would transfer the same amount of heat to the room, provided the necessary amount of heat were supplied to each.

In the following applications, the numerical values given above will be used as if they were exact, but it must be understood that they are merely representative and would not apply exactly to any particular case except by chance. The effect of painting on the capacity of a radiator depends upon the size and design of the radiator. The reduction in capacity produced by the application of aluminum paint is less for large radiators than for small ones, especially so in the case of large radiators having many columns or tubes per section. In a large tubular type radiator having 7 tubes per section, more than 3/4 of the heat is carried away by the air directly, and painting with aluminum consequently reduces the capacity of the radiator only about 10%. If only the visible portions of a radiator are painted with aluminum paint, the reduction in capacity is also obviously less than if the entire surface is covered.

Application 1. Suppose a house in which all the radiators are painted with aluminum paint, and that the radiator in one room is found to be too small, so that when the other rooms are warm enough, this one is too cold. If the radiator in this room is painted with non-metallic paint either white or colored, the heat emitted by it can be increased from 10 to 20% without affecting conditions in the other rooms, although it will be necessary to burn more fuel to supply the additional heat in the one room. If the increase is sufficient the expense of installing a larger radiator may thus be avoided.

Similarly, it is possible, by using bronze or aluminum paint on radiators in rooms which are overheated, and colored or white paints in rooms not sufficiently heated, to improve conditions without going to the expense of installing new radiators of larger or smaller sizes.

Application 2. In installing radiators in a new

house, somewhat smaller radiators may be installed if they are to be painted with colored paints, rather than bronze or aluminum paints.

Application 3. If the radiators on a hot water system are painted with metallic paint, and are all too small, so that the water must be kept hotter than is desired in order to heat the house, they should be repainted with non-metallic paint, and it should then be possible to heat the house with the water in the system not quite so hot. There will be no noticeable saving of fuel.

Application 4. Since basements are usually overheated so that much of the heat supplied there is wasted, some economy can be effected by painting the heater and pipes with metallic paint. This can not, however, serve as anything more than a poor substitute for a covering of good insulating material, about an inch thick, which is capable of making an appreciable saving in the coal bill. The insulating material will remain effective for years, which the paint becomes ineffective if covered with dust.

Application 5. If a radiator is situated next to an outside wall, as most of them are, it is evident that the heat supplied directly to this wall is more or less wasted. Some slight economy may be obtained, therefore, by using metallic paint on the side facing the wall and non-metallic paint on the visible portions. The gain is not large enough to be important, but on the other hand, in putting non-metallic paint over metallic, it is not worth while to go to the trouble of repainting the side next the wall.

The Architectural Magazines

(Continued from page 3)

a democratic philosophy, or at anything except a determination to do the very best job he can."

And here is another:—

"There is one way to "Rebuild America" as it should be rebuilt, if it is to be, and that is by the dedication of the individual architect to beauty in design, science in plan, and integrity in execution, with a due respect and regard for the traditions and spirit of the locality and of the art of architecture."

I fully agree.

The Monograph Series are a fine selection as always, about as well presented a lot of subjects as appear in any magazine.

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INAUGURATES

A NEW SERVICE

See Page 2